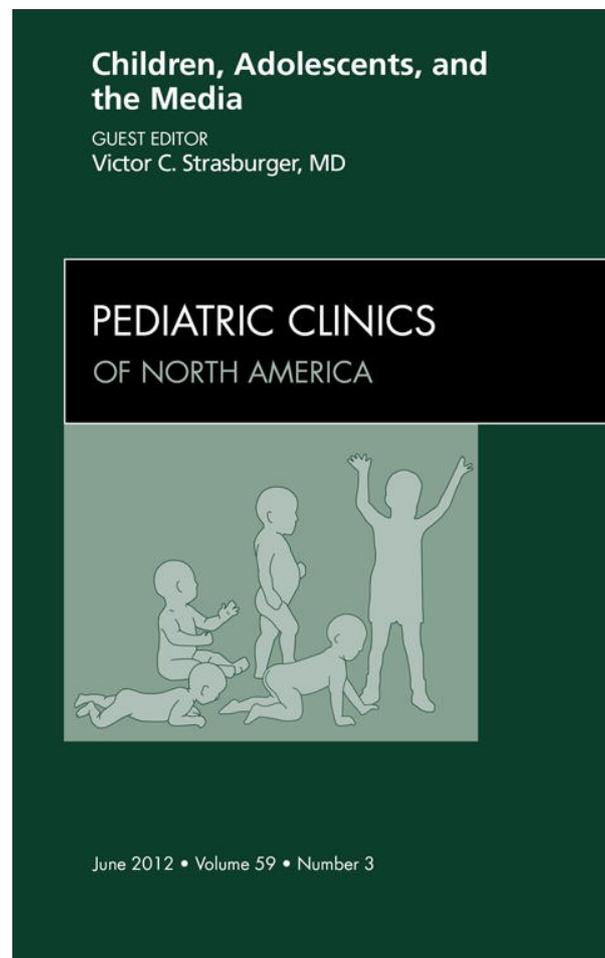


Provided for non-commercial research and education use.  
Not for reproduction, distribution or commercial use.



This article appeared in a journal published by Elsevier. The attached copy is furnished to the author for internal non-commercial research and education use, including for instruction at the authors institution and sharing with colleagues.

Other uses, including reproduction and distribution, or selling or licensing copies, or posting to personal, institutional or third party websites are prohibited.

In most cases authors are permitted to post their version of the article (e.g. in Word or Tex form) to their personal website or institutional repository. Authors requiring further information regarding Elsevier's archiving and manuscript policies are encouraged to visit:

<http://www.elsevier.com/copyright>

# Children, Adolescents, and the Media: Health Effects

Victor C. Strasburger, MD<sup>a,\*</sup>, Amy B. Jordan, PhD<sup>b</sup>,  
Ed Donnerstein, PhD<sup>c</sup>

## KEYWORDS

• Media • TV • New technology • Internet • Cyberbullying • Sexting • Media literacy

## KEY POINTS

- Young people now spend 7 to 11 hours per day with a variety of different media—more time than they spend in school or sleeping.
- Research has shown that children and teenagers learn from the media, and their behavior can be influenced by media.
- Media can have significant effects on health: eg, obesity, aggressive behavior, substance use, early sexual activity, eating disorders.
- Media can be powerfully prosocial at times.
- Parents, clinicians, and schools need to adapt to the world of new technology and understand the influence that media can have on young people.

*True, media violence is not likely to turn an otherwise fine child into a violent criminal. But, just as every cigarette one smokes increases a little bit the likelihood of a lung tumor someday, every violent show one watches increases just a little bit the likelihood of behaving more aggressively in some situation.*

—Psychologists Brad Bushman and L. Rowell Huesmann<sup>1(p248)</sup>

*“Something’s in the air, and I wouldn’t call it love. Like never before, our kids are being bombarded by images of oversexed, underdressed celebrities who can’t seem to step out of a car without displaying their well-waxed private parts to photographers.”*

—Lead article, *Newsweek*, February 12, 2007<sup>2</sup>

*One erect penis on a US screen is more incendiary than a thousand guns.*

—*Newsweek* critic David Ansen<sup>3(p66)</sup>

---

<sup>a</sup> Department of Pediatrics, Division of Adolescent Medicine, University of New Mexico School of Medicine, MSC10 5590, 1 University of New Mexico, Albuquerque, NM 87131, USA; <sup>b</sup> Media and Developing Child Sector, Annenberg Public Policy Center, University of Pennsylvania, 202 South 36th Street, Philadelphia, PA 19104-6220, USA; <sup>c</sup> Department of Communication, University of Arizona, 1103 East University Boulevard, PO Box 210025, Tucson, AZ 85721, USA

\* Corresponding author.

E-mail address: [VStrasburger@salud.unm.edu](mailto:VStrasburger@salud.unm.edu)

*A cigarette in the hands of a Hollywood star onscreen is a gun aimed at a 12- or 14-year-old.*

— Screenwriter Joe Eszterhas<sup>4</sup>

*Research shows that virtually all women are ashamed of their bodies. It used to be adult women, teenage girls, who were ashamed, but now you see the shame down to very young girls—10, 11 years old. Society's standard of beauty is an image that is literally just short of starvation for most women.*

— Best-selling author Mary Pipher<sup>5</sup>

*[My doctor's] only gone to one medical school, but if you go online, you can get advice from all over the world.*

— Teenager quoted in *TECHsex USA, 2011*<sup>6(p17)</sup>

*We are doing our youth a disservice if we believe that we can protect them from the world by limiting their access to public life. They must enter that arena, make mistakes, and learn from them. Our role as adults is not to be their policemen, but to be their guide.*

— danah boyd, 2007<sup>7</sup>

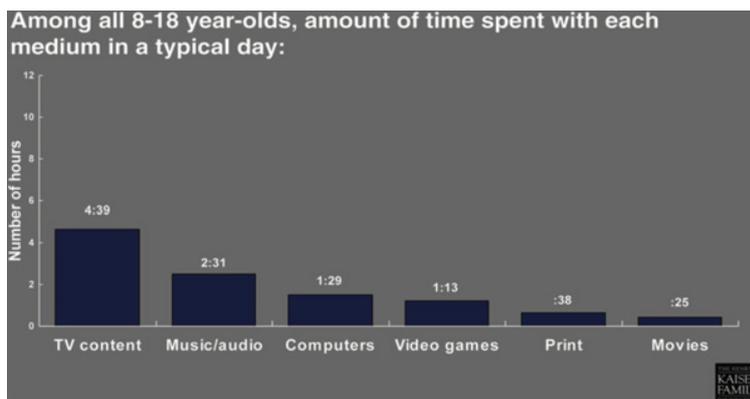
Media represent one of the most powerful and underappreciated influences on child and adolescent development and health. More than 50 years of media research and thousands of media effects studies attest to the potential power of the media to influence virtually every concern that parents and clinicians have about young people: aggressive behavior, sex, drugs, obesity, eating disorders, school performance, suicide, and depression.<sup>8</sup> Although the media cannot be accused of being the leading cause of any of these health problems, they can make a substantial contribution. Yet media can also be powerfully beneficial in the lives of children and adolescents. Not only can they teach young children numbers and letters and increase school readiness (eg, *Sesame Street*),<sup>9</sup> the media can also teach more abstract concepts like empathy, acceptance of diversity, and respect for the elderly.<sup>10,11</sup> Clearly, much more research is needed,<sup>12</sup> but clinicians, parents, school administrators, and government officials all need to be aware of the research on the effects of modern media and act accordingly (**Fig. 1**).

## “OLD” VERSUS “NEW” MEDIA

According to a recent report, media represent the leading leisure-time activity for both children and adolescents (**Fig. 2**).<sup>13</sup> Young people spend more than 7 hours a day with a variety of different media, but despite the onslaught of new media “gadgets”



**Fig. 1.** (Copyright © Patrick O'Connor/*The Kent-Ravenna, Ohio Record Courier*. Used with permission.)



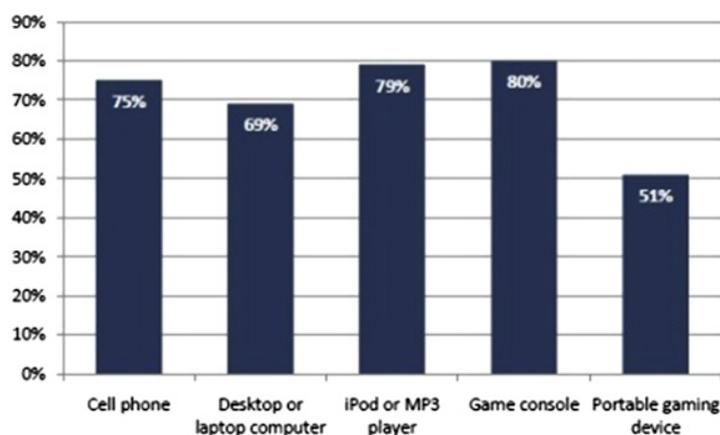
**Fig. 2.** Children spend >7 hours a day with a variety of different media. (Reproduced with permission from Kaiser Family Foundation.)

(**Fig. 3**),<sup>14</sup> TV remains the predominant medium, even for teenagers (**Fig. 4**). Presence of a bedroom TV increases the average number of hours of media use to more than 11 hours per day (**Fig. 5**)<sup>13,15</sup> and increases the risk of obesity by 31%,<sup>16</sup> doubles the risk of smoking,<sup>17</sup> diminishes sleep,<sup>18</sup> and lessens participation in hobbies and reading.<sup>8</sup> It also lessens the ability of parents to monitor their children's viewing habits (**Fig. 6**).<sup>19</sup> Television viewing is now at an all-time high in the United States.<sup>20</sup> Black and Hispanic children spend 5 to 6 hours per day watching TV, compared with 3.5 hours for white youth.<sup>13,21</sup> What has changed is that TV is not necessarily viewed on the television set in the den anymore; increasingly, teens are downloading shows to their computers, their iPhones, their iPads, and their cell phones. About 60% of young people's TV viewing consists of live TV on a TV set, but the other 40% is now either time-shifted or watched online, on mobile devices, or DVDs.<sup>13</sup> Less than 30% say that there are parental rules about how much time they can spend watching TV.<sup>13</sup>

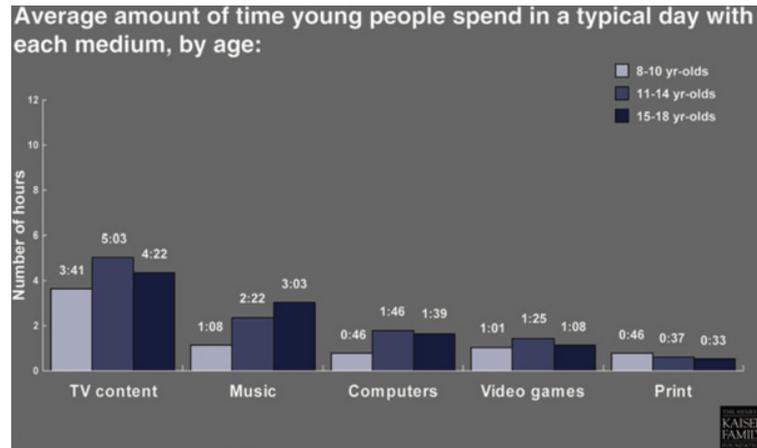
But "new" technology has become increasingly important as well. Six years ago, nearly one-third of 8- to 18-year-olds surveyed had Internet access or a computer in their bedroom.<sup>19</sup> The increasing availability of laptop computers in homes, as well as wireless Internet access, means that children today can go online anywhere, at

### Teen gadget ownership

The percent of all teens ages 12-17 who own each of the following devices, as of September 2009.



**Fig. 3.** The popularity of new technology with teenagers. (From Lenhart A, Ling R, Campbell S, et al. Teens and Mobile Phones. Pew Internet & American Life Project, April 20, 2010. Available at: <http://pewinternet.org/~media/Files/Reports/2010/PIP-Teens-and-Mobile-2010-with-topline.pdf>.)



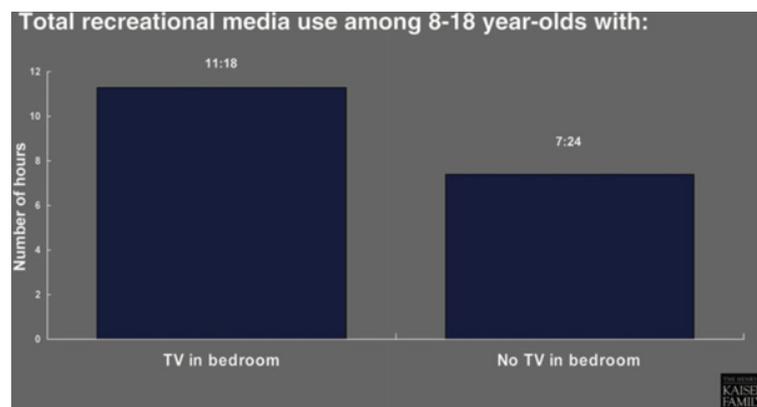
**Fig. 4.** Even for teenagers, TV remains the predominant medium. (Reproduced with permission from Kaiser Family Foundation.)

any time. Half of 8- to 18-year-olds say that they have a video game player in their room.<sup>13</sup> Common Sense Media conducted a survey with a nationally representative sample of children ages 0 to 8. Their findings drive home the fact that media use begins early, and that media technology is widely available in homes with very young children.<sup>22</sup>

- More than a third (39%) of children 8 and younger live in homes where the television is left on all or most of the time, whether or not anyone is watching it.
- Of children 8 and younger, 42% have a TV in their bedroom, and most live in a home with a computer (72%) and high-speed Internet (68%).
- More than half (52%) of homes with young children own a smartphone, a video iPod, an iPad, or a similar tablet device. About 1 in 4 parents of 0- to 8-year-olds say they have downloaded an “app” for their children (although most parents of children this age admit that they do not know what an “app” is).

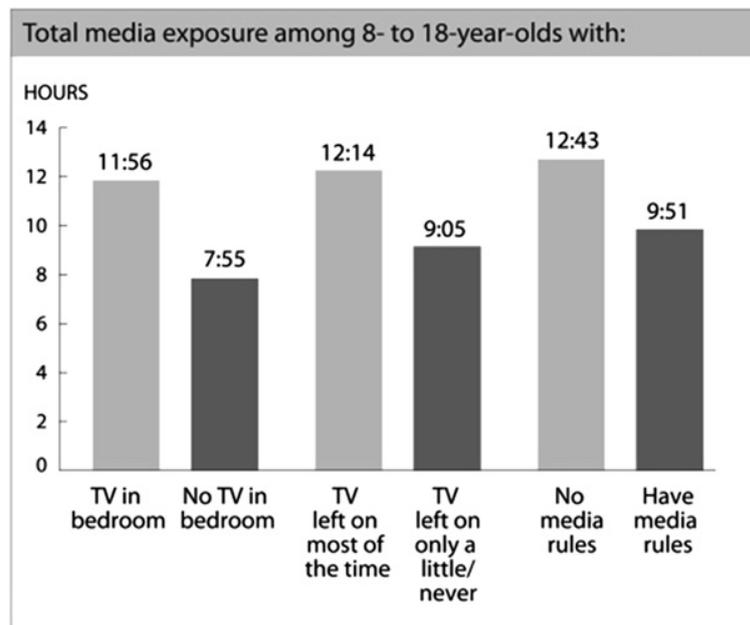
Both the Nielsen Company and the Pew Internet & American Life Project have been tracking new media use among adolescents, and their studies highlight the immersive media environment of young people’s lives, particularly their social lives<sup>23,24</sup>:

- American 18-year-olds now average nearly 40 hours per week online from their home computers, including 5.5 hours of streaming video.



**Fig. 5.** The presence of a TV in the bedroom increases screen time considerably. (Reproduced with permission from Kaiser Family Foundation.)

## Media Exposure, by TV Environment and Rules



**Fig. 6.** Presence of a bedroom TV neutralizes parents' ability to monitor screen time. (*Reproduced with permission from Kaiser Family Foundation.*)

- Nearly all teenagers (93%) now use the Internet. In a 2009 survey, 70% of 12- to 17-year-olds owned a cell phone, and 80% owned an iPod and a game console.
- More than 78% of 12- to 17-year-olds have visited social networks or read blogs.
- Some 75% of 12- to 17-year-olds now own cell phones, up from 45% in 2004. Nearly all teens (88%) are texters.
- Teenagers actually talk less on their phones than any other age group except for seniors. But in the first 3 months of 2011, teens 13 to 17 sent an average of 3364 texts per month. Half of teens send 50 or more text messages per day and one-third send more than 100 per day.
- Teenage boys typically send and receive 30 texts a day; girls 80 texts per day.
- Of 12- to 17-year-olds, 26% say that they have been bullied or harassed via text messages or phone calls. Only 4% say that they have sent a nude or nearly nude image of themselves to someone else ("sexting"), but 15% say that they have received such a text.
- Half of all cell-phone-owning teens ages 16 to 17 say that they have talked on their phone while driving; one-third say that they have been texting while driving.

Virtually *all* teenagers now have MP3 players, and they often use high-volume settings.<sup>25</sup> Adolescents are notorious multitaskers: nearly 40% of 7th to 12th graders say that they multitask frequently, listening to music (43%), using the computer (40%), or watching TV (39%).<sup>13</sup> Some neuroscientists worry about how efficient multitasking really is and its impact on the developing adolescent brain.<sup>26,27</sup>

Slowly, the changes in media platforms and media use are changing adult society in significant ways as well. For example, the Internet is slowly closing in on TV as Americans' source of national and international news.<sup>28</sup> Many observers feel that the media have a major impact on presidential elections. The average sound bite has decreased from more than 40 seconds in the 1968 election to an average of 7.8 seconds in the 2004 election.<sup>29,30</sup> Other possible behavioral implications of all of this media use are discussed as follows.

## HOW DO MEDIA AFFECT CHILDREN AND ADOLESCENTS?

Considerable research attests to the fact that the media can be powerful teachers of young people, shaping their attitudes, beliefs, and behaviors.<sup>8</sup> There are many theories to explain exactly how this might occur, but first the *displacement effect* must be acknowledged: when children and teens spend more than 7 hours a day with media, those are hours that are not spent outside playing, reading a book, or talking with friends. Three of the most appealing theories of media effects are (1) Social Learning Theory, (2) Script or Schema Theory, and (3) “Super-Peer” Theory. According to social learning theory, children and teens learn by observing and imitating attractive role models, precisely what they see on the TV or movie screen, particularly when they see behaviors that are realistic or rewarded.<sup>31</sup> For preteens and teens, “script theory” is extremely relevant, as the media present youth with common “scripts” for how to behave in unfamiliar situations, such as in romantic relationships.<sup>32</sup> Finally, the “super-peer” theory, originally proposed by Strasburger in 1995,<sup>33</sup> states that the media exert inordinate pressure on children and teens to engage in what is depicted as being normative behavior (eg, everyone drinks at a party). The importance of peer pressure on adolescent behavior is universally acknowledged; the media function as a super-peer.<sup>33,34</sup>

Given the abundant research on harmful media effects and the time that young people spend with media, one might think that parents and society in general would be quite cautious and concerned about letting children be exposed to seemingly unending violence, sex, drugs, and commercialism. However, the “third-person effect” seems to mitigate against such concern: teenagers, parents, and adults think that the media affect everyone else except themselves or their children.<sup>35,36</sup> This phenomenon is well-documented in the communications literature.

## VIOLENCE AND AGGRESSIVE BEHAVIOR

### *The Problem of Media Violence*

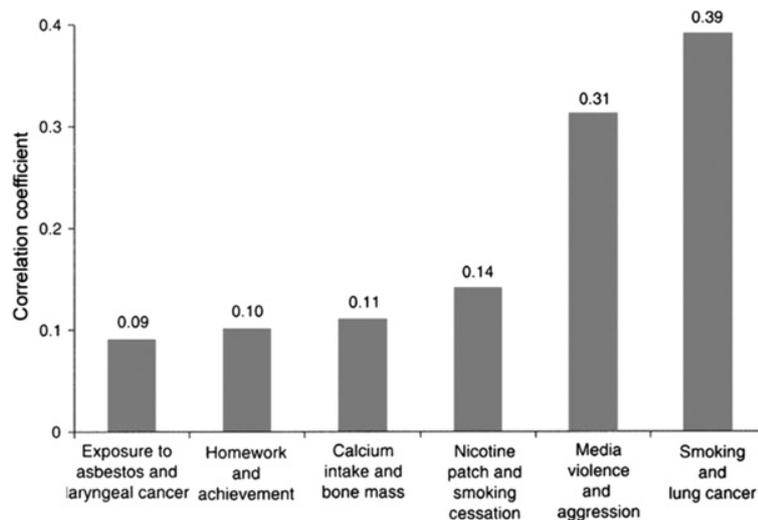
---

According to a broad consensus of medical, public health, and government organizations, the evidence is now clear and convincing that exposure to media violence is *one* of the causal factors in real-life violence and aggression.<sup>37</sup> Of all media research, this is the one area that has been most thoroughly investigated. Research goes back as far as the 1950s,<sup>38</sup> and the US Senate held hearings on the subject in 1952. More than 2000 research reports are now listed by the new Center on Media and Child Health at Harvard.<sup>39</sup> A US Surgeon General’s report in 1972,<sup>40</sup> a National Institute of Mental Health report 10 years later,<sup>41</sup> an FBI report on school shootings in 2000,<sup>42</sup> and most recently a Federal Communications Commission report in 2007<sup>43</sup> have all concluded that there is “strong evidence” that exposure to media violence can increase aggressive behavior in children and adolescents. More than 98% of pediatricians in one survey agree.<sup>44</sup> Yet the entertainment industry and a few professional naysayers have refused to accept these findings.<sup>45</sup> The debate should now be over.<sup>46,47</sup>

### *How Good Are the Data?*

---

The strength of the association is sometimes at issue; certainly, media violence cannot be blamed as the leading cause of violence in society. But, epidemiologically, it does contribute approximately 10% to societal violence,<sup>48</sup> and the association between media violence and real-life violence is actually stronger than many of the public health risks that the public takes for granted (**Fig. 7**).



**Fig. 7.** The impact of media violence on real-life aggressive behavior is stronger than many commonly accepted public health risks and nearly as strong as the link between smoking and lung cancer. (Adapted from Bushman BJ, Huesmann LR. Effects of televised violence on aggression. In: Singer DG, Singer JL, editors. Handbook of children and the media. Thousand Oaks (CA): Sage; 2001; with permission.)

The research is also clear that nearly everyone is desensitized by the violence they witness vicariously, through the media,<sup>49,50</sup> and that media violence that seems acceptable to adults can be extremely scary for young children.<sup>50,51</sup>

### **“Old” Media**

The problems with media violence are both quantitative and qualitative. In terms of quantity, American children and adolescents are inundated with portrayals of violence:

- The National Television Violence Study examined 10,000 hours of programming from 1995 to 1997 and found that 61% contained interpersonal violence. Counterintuitively, children’s programming actually contained more violence than adult programming.<sup>52</sup>
- Similarly, children’s films are rife with violence, even G-rated films. A study of all animated feature films between 1937 and 1999 found that 100% portrayed violence.<sup>53</sup>
- Films for preteens and teens are just as violent: a study of the top-rated PG-13 films of 1999–2000 found that 90% contained violence, half of it of lethal magnitude.<sup>54</sup> In 2003, more than 10% of 10- to 14-year-olds saw 40 of the most violent movies.<sup>55</sup>
- Several studies show that children can easily access violent media that their parents would deem inappropriate for them.<sup>13,56</sup> A recent analysis of the content of popular films from 1988 to 2006 found significant increases in violent content in the PG-13 rating category, leading the authors to conclude that there has been a greater leniency toward violent content by the Motion Picture Association of America ratings board.<sup>57</sup>
- Music lyrics have also become more violent, especially rap music.<sup>58</sup>

### **“New” Media**

New technology has brought media violence into new platforms and into much more intimate settings, like children’s bedrooms:

- A survey of 1500 10- to 15-year-olds found that 38% had been exposed to violent scenes on the Internet.<sup>59</sup>

- Half of all video games contain violence, including more than 90% of games rated appropriate for children 10 years or older (E10+ and T ratings).<sup>60</sup> Video games can mimic sexual assault (“RapeLay”) or the Columbine massacre (“School Shooter”), allow the player to torture enemies (“Soldier of Fortune”), play “fetch” with dogs chasing the heads of slaughtered victims (“Postal 2”), cut victims in 2 from the crotch up with a chainsaw (“MadWorld”), or just brutally murder people (“Manhunt”).
- Violent video games are also extremely popular, especially with boys. Children in the fourth to eighth grades prefer playing violent video games, and more than three-fourths of boys reported owning M-rated games in one survey.<sup>61,62</sup> Recent research suggests that playing violent games that feature violence against women is positively associated with Rape Myth Acceptance and negative attitudes toward women.<sup>63</sup>
- Cyberbullying has become a new and significant concern, although the magnitude of the problem is difficult to discern. Several reports put the figure at between 9% and 35% of young people who say that they have experienced electronic aggression.<sup>64–69</sup> Internet bullying may peak in middle school.<sup>70</sup> Rates of perpetration are lower in high school, 4%–21%.<sup>65</sup> The type of aggression varies from rude comments (32%) to threatening comments (14%) to rumors (13%).<sup>66</sup> As with other forms of bullying, there is overlap between victims and perpetrators, with 7% to 14% of youth reporting being both a victim and a perpetrator of electronic aggression.<sup>66,71</sup>
- Although some overlap exists, nearly two-thirds of 10- to 15-year-olds who say they were harassed online did not report being bullied at school. Of concern, youth who report being cyberbullied were 8 times more likely than all other youth to report carrying a weapon to school in the past 30 days.<sup>65</sup>
- A 3-year survey of more than 1500 10- to 15-year-olds from 2006 to 2008 has found an increase in text messaging harassment over time, with nearly 20% of the sample reporting harassment via text messaging in the previous year.<sup>69</sup>

Qualitatively, American media not only display violence frequently, but they do so in very problematic ways: funny violence,<sup>72</sup> justifiable violence,<sup>52</sup> realistic violence,<sup>52</sup> and violence without consequences.<sup>52</sup> The notion of “justifiable violence” (“good guys” vs “bad guys”) is the most prevalent and the most positively reinforcing feature of American media violence.<sup>37,45,73</sup> Research has shown that repeated exposure to media violence can lead to anxiety and fear, particularly for young children,<sup>51</sup> acceptance of violence as a suitable means for resolving conflict,<sup>74</sup> desensitization,<sup>49</sup> and decreases in altruism.<sup>75</sup>

There are only a handful of studies to date on cyberbullying and its effects. For the perpetrators, it may be a strong predictor of serious aggressive behavior.<sup>65,68</sup> For the victims, the impact seems to be somewhat magnified because children and teens no longer feel safe at home, as they would with in-person bullying at school.<sup>76</sup>

New media have amplified the potential impact: variants of first-person shooter video games like “Manhunt” and “Call of Duty” are used by the US military to desensitize new recruits.<sup>77</sup> In one of the school shootings during the 1990s, a teenager walked into his school in Paducah, Kentucky, and opened fire on a prayer group. In spite of never having fired a gun in his life, Michael Carneal hit 8 different teens with 8 shots, all head and upper torso, resulting in 3 deaths and 1 case of paralysis. He had learned to fire a gun from playing first-person shooter video games.<sup>77</sup>

## SEX

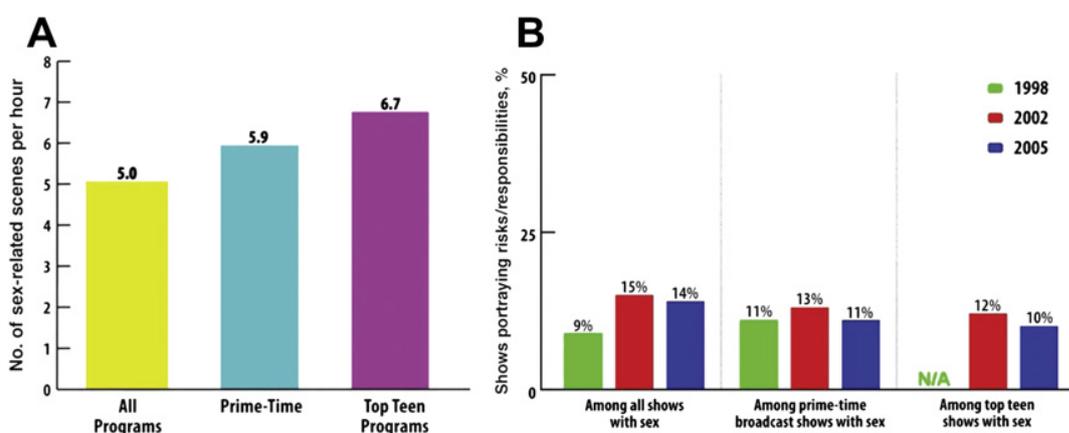
In the absence of effective sex education by parents or in schools, the media have arguably become the leading sex educator in the United States today.<sup>78–80</sup> Given

how suggestive mainstream media content is, and how shy writers, producers, and advertisers are about depicting birth control, this is not an entirely healthy situation.<sup>79</sup> There is now considerable research that sexual content in the media contribute not only to adolescents' attitudes and beliefs about sex,<sup>81</sup> but to their sexual behavior as well, especially to earlier intercourse.<sup>82</sup> Although the teenage pregnancy rate in the United States has declined significantly in the past 2 decades, it remains the highest in the Western world.<sup>83</sup> In 2009, more than 400,000 15- to 19-year-olds gave birth: 4% of all female teens in that age group.<sup>84</sup> Also in 2009, nearly half of all high school students reported ever having had sexual intercourse.<sup>85</sup> Any factor that could possibly help delay intercourse among young teenagers, lower rates of sexually transmitted infections (STIs), or prevent pregnancy is worth considering.

### ***Sexual Content in "Old" and "New" Media and Its Impact***

Clearly, teenagers' use of media is in a state of flux; but it is equally clear that sexual content is now pervasive: TV, movies, magazines, music, Internet, video games, cell phones, and social networking sites. Unfortunately, the last major content analysis of American TV is now 6 years old.<sup>86</sup> At that time, more than 75% of primetime TV programs contained sexual content, yet only 14% of sexual references mentioned risks or responsibilities of sexual activity (**Fig. 8**). A newer study finds that although parents worry about exposure to sexual material on the Internet, TV is the leading culprit: exposure to sexual content is highest with TV (75%) compared with music (69%) and the Internet (16%–25%).<sup>87</sup> Research also shows that the amount of sexual content has continued to increase during the past 2 decades,<sup>88,89</sup> and remarkably, teen shows actually have more sexual content now than adult shows.<sup>86</sup> Talk about sex can occur as often as 8 to 10 times per hour.<sup>88</sup> Recently, so-called reality shows have become rife with sex; and the major theme seems to be who "hooks up" with whom.<sup>79,89</sup> In 1997, there were only 3 reality dating shows; by 2004, there were more than 30.

Examples of provocative teenage sex on TV are numerous: the MTV series *Skins* featured teen girls having sex with each other and teen boys taking erectile dysfunction drugs; CW's *Gossip Girl* has featured a threesome; and Showtime's *Shameless* depicts both teenage boys as being sexually active—one of them with a married man.<sup>90</sup> One survey actually found that in the 25 highest-rated primetime series among teenagers, teen female characters were engaged in sexual behavior 47% of the time versus adult women only 29% of the time.<sup>91</sup> Similarly, sexual language is flowing freely on primetime



**Fig. 8.** (A) Programs for teenagers actually contain more sexual content than adult-oriented programs. (B) Despite the prevalence of sexual content on television, fewer than 14% of shows contain any mention of the risks and responsibility of sexual activity. (Reproduced with permission from Kaiser Family Foundation. Sex on TV 4, Executive Summary 2005. Available at: [www.kff.org/entmedia/upload/sex-on-TV-Executive-Summary.pdf](http://www.kff.org/entmedia/upload/sex-on-TV-Executive-Summary.pdf).)

TV. The 2011 Fall season has been termed “television’s season of the vagina,” with comments like “When did vaginas get so boring” on the new comedy *Whitney* and “that’s the sound of my vagina drying up” on the hit comedy *Two Broke Girls*.<sup>92,93</sup> Yet, curiously, discussion of contraception remains rare among shows popular with teens. *Glee* never mentions birth control, one of the *Gossip Girl* characters has had sex with at least 8 different men without mention of contraception, and *90210* has had an HIV-positive storyline but rarely mentions safe sex. Only *The Secret Life of the American Teenager* has discussed both birth control pills and condoms and ends with a public service announcement (PSA) directing teens to health care resources.<sup>94</sup>

Other “old” media are also filled with sexual content:

- Pornography is a big business in the United States, nearly \$13 billion a year,<sup>95,96</sup> and teenagers have surprisingly easy access to a variety of R- and X-rated material. In one 2001 study, 30% of teen girls had seen an X-rated movie within the prior 3 months.<sup>97</sup> Older studies have found that nearly all 13- to 15-year-olds report having seen an X-rated film and that by age 15, most teenagers have seen or read *Playboy*, *Playgirl*, or similar magazines.<sup>8</sup> Newer studies have found that the increased use of the Internet by teens has dramatically increased exposure to X-rated materials. Recent studies find that more than 50% of teens indicate exposure to “unwanted” sexual material.<sup>97</sup> Of concern is the fact that many popular pornographic videos depict aggression against women.<sup>98</sup>
- An analysis of the 279 most popular songs in 2005 showed that more than one-third contained sexual references, many of which were degrading to women.<sup>99</sup> A survey of the *Billboard Top 100* year-end songs at the end of every decade from 1959 to 2009 found significant increases in sexy lyrics.<sup>100</sup>
- Virtually every R-rated teen movie since the 1980s has contained at least 1 nude sex scene and often several references to sexual intercourse.<sup>79</sup>
- Teen magazines devote an average of 2.5 pages per issue to sexual topics, and the prime subject of discussion seems to be when to lose one’s virginity.<sup>81,101</sup>
- In one study of mainstream advertising, women were as likely to be shown in suggestive clothing (30%), partially clothed (13%), or nude (6%) as they were being fully clothed.<sup>102</sup>

The question always asked of media researchers is, “does any of this abundant sexual content have any actual behavioral consequences?” Increasingly, the answer is yes. There are now 14 longitudinal correlational studies that allow cause-and-effect conclusions to be drawn,<sup>82</sup> and virtually all of them show an impact of sexual content in the media on adolescents’ sexual behavior (**Table 1**).<sup>103–119</sup> In particular, the risk of early sexual intercourse appears to double with exposure to a lot of sexual content at a young age.<sup>79,80</sup> Exposure to degrading sexual lyrics has also been reported to be a risk factor for early sexual experience among teens.<sup>120</sup>

### **Contraceptive Advertising**

One of the more intriguing aspects of media sex is that the entertainment industry is seemingly so fond of depicting sex but so reticent about discussing birth control.<sup>121,122</sup> The same applies to the advertising industry as well. Sex is used to sell virtually every product imaginable *except* for birth control. In particular, ads for erectile dysfunction (ED) drugs now dominate the TV screen. In the first 10 months of 2004, the makers of these drugs spent nearly \$350 million on advertising.<sup>123</sup> By 2008, more drug company money was being spent on direct-to-consumer advertising ED drugs than on statins, antidepressants, bone resorption inhibitors, or sleep meds.<sup>124</sup>

The United States is the only Western country that still subscribes to the myth that giving teenagers access to birth control will make them sexually active at a younger age.<sup>79</sup> And the media now represent a major access point for teens about sex, sexuality, and contraception. Nine published, peer-reviewed studies have found that giving teenagers access to birth control does not increase their sexual activity but does increase their use of contraception and decreases their risk of sexually transmitted infections.<sup>125–133</sup> Yet several of the 6 major TV networks refuse to air ads for condoms or birth control pills.<sup>79,122</sup> In one well-publicized incident, both FOX and CBS refused to air an ad for Trojan condoms (“Evolve. Use a condom every time.”) because those 2 networks will only air condom ads that restrict their content to preventing HIV and AIDS, not other STIs or pregnancy.<sup>122</sup> Ads for birth control pills are similarly rarely aired and when they are, the words “pregnancy-prevention” are nearly always absent.<sup>79</sup> Ads for emergency contraception are virtually nonexistent, yet every year American women have 3 million unplanned pregnancies, which lead to 1.3 million abortions. Advertising emergency contraception could be a major way to reduce the number of abortions in the United States.<sup>134</sup>

With “new” media have come not only the traditional concerns but a host of new concerns as well: easier exposure to pornography via the Internet, sexting, the posting of risky behaviors on social networking sites, and online solicitation for sex. Young people’s exposure to online pornography is obviously difficult to assess accurately, given research restraints and the fact that studies have to rely on self-reports. A 2001 Kaiser Family Foundation survey found that 70% of teenagers had been exposed to pornography, although most of them said it had been “inadvertent.”<sup>135</sup> A newer study of 1500 youth nationwide found that by 2006, only 42% reported seeing pornography online<sup>136</sup>; however, another recent study puts the figure at 93% of males and 62% of females by age 18.<sup>137</sup> As with X-rated movies and explicit magazines, it is entirely possible that most teenagers have seen online pornography by the time they finish high school.<sup>97</sup>

What impact pornography has on young people is conjectural at best, as researchers are prohibited from studying them in detail about such a sensitive subject. By necessity, nearly all studies on pornography and young people come from college-age students. Summarizing the vast adult literature is problematic,<sup>138</sup> but in general the research shows that nonviolent pornography has no behavioral consequences, but violent pornography, like media violence in general, may.<sup>8</sup> Only 4 studies have specifically examined children or teenagers:

- A recent longitudinal study of more than 1500 10- to 15-year-olds found a nearly sixfold increase in the odds of self-reported sexually aggressive behavior with exposure to violent x-rated material over time, whereas exposure to nonviolent x-rated material was not statistically related.<sup>99</sup>
- Another longitudinal study found that exposure to x-rated material (magazines, movies, and Internet porn) increased the risk of early sexual intercourse or oral sex.<sup>113</sup>
- A third study found an increase in “sexual preoccupation” with exposure to Internet pornography.<sup>112</sup>
- A cross-sectional study of 433 adolescents in New York City found that visiting sexually explicit Web sites was linked to a greater likelihood of having multiple lifetime sexual partners and having greater sexual permissiveness.<sup>139</sup>

### **Sexting**

The dilemma of how to get accurate prevalence data is similar for “sexting”—the transmission via cell phone of sexually explicit photos.<sup>140</sup> The first study was done

**Table 1**  
Recent longitudinal studies of the impact of sexual content on sexual behavior

Study	N	Media Type	Duration	Findings
Wingood et al, <sup>103</sup> 2003	480 14–18 y females	Rap videos	1 y	Exposure to sexual rap videos predicted multiple partners
Collins et al, <sup>104</sup> 2004	1792 12–17 y	TV	1 y	Sexual media exposure strongly predicted intercourse a year later
Ashby, et al, <sup>105</sup> 2006	4808 7th–12th grade	TV	1 y	>2 h TV/d increased risk of intercourse 1.35×
Brown et al, <sup>106</sup> 2006	1107 12–14 y	Sexual media, media diet (TV, movies, magazines, music)	2 y	2× increased risk of sexual intercourse for white teens with high sexual media diet
Martino et al, <sup>107</sup> 2006	1242 12–17 y	Music	3 y	Degrading sexual content predicted earlier intercourse
Bersamin et al, <sup>109</sup> 2008	887 12–16 y	TV	1 y	Parental co-viewing of TV protective against early intercourse and oral sex
Bleakley et al, <sup>110</sup> 2008	501 14–16 y	TV, movies, magazines, music, video games	1 y	Positive and reciprocal relationship between media exposure and intercourse
Chandra et al, <sup>108</sup> 2008	744 12–20 y	TV	3 y	Sexual media exposure = a strong predictor of teen pregnancy
Peter & Valkenburg, <sup>111</sup> 2008	962 13–20 y	Internet	1 y	Exposure to sexual content on the Internet increased sexual preoccupation
Brown and L'Engle, <sup>112</sup> 2009	967 7th–8th graders	X-rated movies magazines, Internet porn	2 y	Early exposure to X-rated media predicts earlier onset of sexual intercourse and oral sex

Delgado et al, <sup>113</sup> 2009	754 7–18 y	TV, movies	5 y	Watching adult-targeted TV increases the risk of intercourse by 33% for every h/d viewed at a young age
Hennessy et al, <sup>114</sup> 2009	506 14–18 y	TV, movies, magazines, music, video games	2 y	Increased risk of intercourse for white teens and media
Bersamin et al, <sup>115</sup> 2010	824 14–18 y	TV	1 y	Premium cable TV viewing associated with casual sex
Ybarra et al, <sup>116</sup> 2011	1159 10–15 y	X-rated media (movies, magazines, Internet pornography)	3 y	Intentional exposure to violent X-rated material predicted a nearly 6× risk of sexually aggressive behavior
Martino et al, <sup>117</sup> 2005	1292 12–17 y	TV	1 y	Exposure to popular teen shows with sexual content increased risk of intercourse 1 year later
L'Engle and Jackson, <sup>118</sup> 2008	854 12–14 y	Sexual media diet	2 y	Peer and media exposure increased risk of early including Internet sex; Stronger connection to parents and schools was protective
Gottfried et al, <sup>119</sup> 2011	474 14–16 y	TV-varying genres	1 y	No impact of overall sexual content found on sexual intercourse but exposure to TV sitcoms did predict earlier intercourse

by the National Campaign to Prevent Teen and Unplanned Pregnancy and found that 20% of nearly 1300 teens in a national survey had sent or posted nude or seminude pictures of themselves<sup>141</sup>; however, this study included 18- to 19-year-olds as well as younger teenagers. Much depends on (1) how the population is defined (Internet users versus all teens, although the 2 groups are becoming virtually the same), (2) how sexting is defined (is it sending photos, receiving them, or both?), and (3) what time period is under scrutiny (the past year or ever?). Since then, 5 more studies have been done, again with varying definitions of sexting and varying sample sizes and ages (**Table 2**).<sup>14,142–145</sup> The prevalence varies as well, especially when the difference between creating and sending explicit photos versus receiving them is ascertained. The “best guess” probably involves the 2 most recent studies. Both the Pew survey and the Youth Internet Safety Survey (YISS)-3 study found a relatively low prevalence of sending explicit messages and a slightly higher rate of receiving them. When the total number of young people online is considered, however, many experts feel that these figures are still alarming.<sup>76</sup> In addition, the legal consequences of sexting may be dire: several states have tried sexting teens as sexual offenders under child pornography laws.<sup>146–148</sup> Yet others have recognized that child pornography laws were initially passed to prevent childhood sexual abuse, not to keep teenagers, with their natural curiosity about sex, from doing dumb things.<sup>149</sup> States like New York and Vermont have moved to decriminalize sexting among teenagers, and other states have made it a misdemeanor rather than a felony. Finally, one new but related area of

<b>Study</b>	<b>Sample</b>	<b>Prevalence</b>	<b>Definition</b>
Sex Tech Survey (2008)	653 teens 13–19 y 627 20–26 y	20%	Sent or posted online nude or seminude pictures or videos
Harris/Teen Online (2009)	655 teens 13–18 y	19%	Received sexually suggestive text messages or e-mails with nude or nearly nude photos
		9%	Sent messages or e-mails
AP-MTV Survey (2009)	1247 14–24 y	45%	Sending or receiving nude or receiving nude photos of themselves or sexual partners via cell phone
South West Grid Survey (2009)	535 teens 13–18 y	40%	Students who knew friends who had shared “intimate” pix or videos
Pew Internet Project (2009)	800 teens 12–17 y	4%	Sent a sexually suggestive nude or seminude picture or video via cell phone
		9%	Received pix or video
Youth Internet Safety Survey 3 (YISS) 2011	1560 10–17 y	7.5%	Creating, appearing in, or receiving pictures showing breasts, genitals, or bottoms during the past year

Data from Strasburger VC. Adolescents, sex, and the media. *Adolesc Med State Art Rev*, in press.

concern is “sextortion”—threatening to send sexually explicit photos via e-mail or the Internet. Several high-profile cases have been prosecuted that have involved the victimization of teens, but no data currently exist on the prevalence of this.<sup>150</sup>

### **Social Networking**

---

Research about social networking and sexual content is still very preliminary. A study of 270 profiles of 18-year-olds on MySpace found that 24% referenced sexual behaviors,<sup>151</sup> but of course MySpace has now been far outdistanced by Facebook. Adolescents who display explicit sexual references also have online friends who do likewise.<sup>152</sup> Among college freshmen, displaying sexual references on Facebook profile pages is positively correlated with intention to initiate intercourse.<sup>153</sup>

### **Online Solicitation**

---

As with “sexting,” reports vary considerably about the prevalence of online solicitations and even about the severity of it as a problem. Between 2000 and 2005, there was a decline in online sexual solicitations according to the first 2 YISS, from 27% of girls in 2000 to 18% in 2005.<sup>154</sup> In the 2007 Growing Up With Media Survey of more than 1500 10- to 15-year-olds, 15% reported an unwanted sexual solicitation online in the previous year. By 2008, this figure had increased to nearly 18%.<sup>69</sup> Only 4% were via a social networking site; more occurred through instant messaging and chat rooms.<sup>155</sup> An examination of more than 7000 arrests for Internet-related sex crimes against minors in 2006 had similar findings: one-third involved social networking sites, but the vast majority were via chat rooms or sting operations.<sup>156</sup> Teenage girls with a history of childhood abuse and provocative online avatars appear to be at increased risk.<sup>157</sup> But the conventional wisdom seems to be that online predatory crimes more often fit into the category of statutory rape by adult offenders with teenagers rather than forcible sexual assault or pedophilia.<sup>158</sup>

### **Prosocial sexual media**

Although all of this sounds alarming and concerning, both “old” and “new” media can be a powerful source of positive sexual information as well. Storylines can feature depictions of responsible sexual activity (loving partners, use of birth control, and so forth), as well as useful health information. The hit show *ER* has dealt with the usefulness of contraception and the risks of human papillomavirus.<sup>159</sup> A 2002 *Friends* episode showed Rachel getting pregnant, despite Ross using a condom. Research by the Rand Corporation found that adolescents who talked about the program content with an adult were more likely to report learning about condoms from the episode and appeared less likely to reduce their perceptions of condom efficacy after the episode.<sup>160</sup> A 2008 episode of *Grey's Anatomy* successfully taught viewers that an HIV+ mother could deliver an HIV- baby.<sup>161</sup> Most recently, the hit show *Glee* has used the bullying of a gay teenager to dramatically sensitize viewers to both issues.<sup>162</sup> To date, shows like *The Secret Life of an American Teenager*, *Teen Mom*, and *16 and Pregnant* are more controversial; and their behavioral impact has not yet been rigorously evaluated<sup>163</sup>; however, in one survey of 162 10- to 19-year-olds, 93% responded that such shows teach them “that teen parenthood is harder than [they] imagined.”<sup>164</sup>

Traditional sex education programs have been expanded to include media education topics and have been shown to be effective.<sup>165</sup> Finally, in North Carolina, a mass media campaign used billboards and radio and TV PSAs to deliver the message, “Talk to your kids about sex. Everyone else is.” Exposure to the campaign message resulted in a significant increase in parents talking to their children about sex in the following month.<sup>166</sup>

New technology is also exploding with possibilities<sup>6,167</sup>:

- Text-messaging safe sex information<sup>168</sup> and information and results of testing for STIs<sup>169</sup>
- Using computer video games like “The Baby Game!” and “It’s Your Game: Keep It Real” to increase knowledge and attitudes favoring avoiding teen pregnancy<sup>170,171</sup>
- New and potent sources of information about birth control, menstruation, pregnancy, and STIs, which may actually have a greater impact than health care providers or family (Fig. 9)
- Responsible online sites like Go Ask Alice, Sex, etc, Planned Parenthood, True Love Waits
- Using viral videos to encourage testing for HIV<sup>172</sup>
- Analogous to traditional media education, online media education about social networking sites has been shown to reduce displays of risky behaviors.<sup>173</sup>

### SUBSTANCE USE AND ABUSE

As with aggressive behavior and sexual activity, the causes of adolescent drug use are multifactorial; but the media can and do often play a significant role.<sup>174,175</sup> In particular, alcohol and tobacco pose the greatest threat to young people and are also the

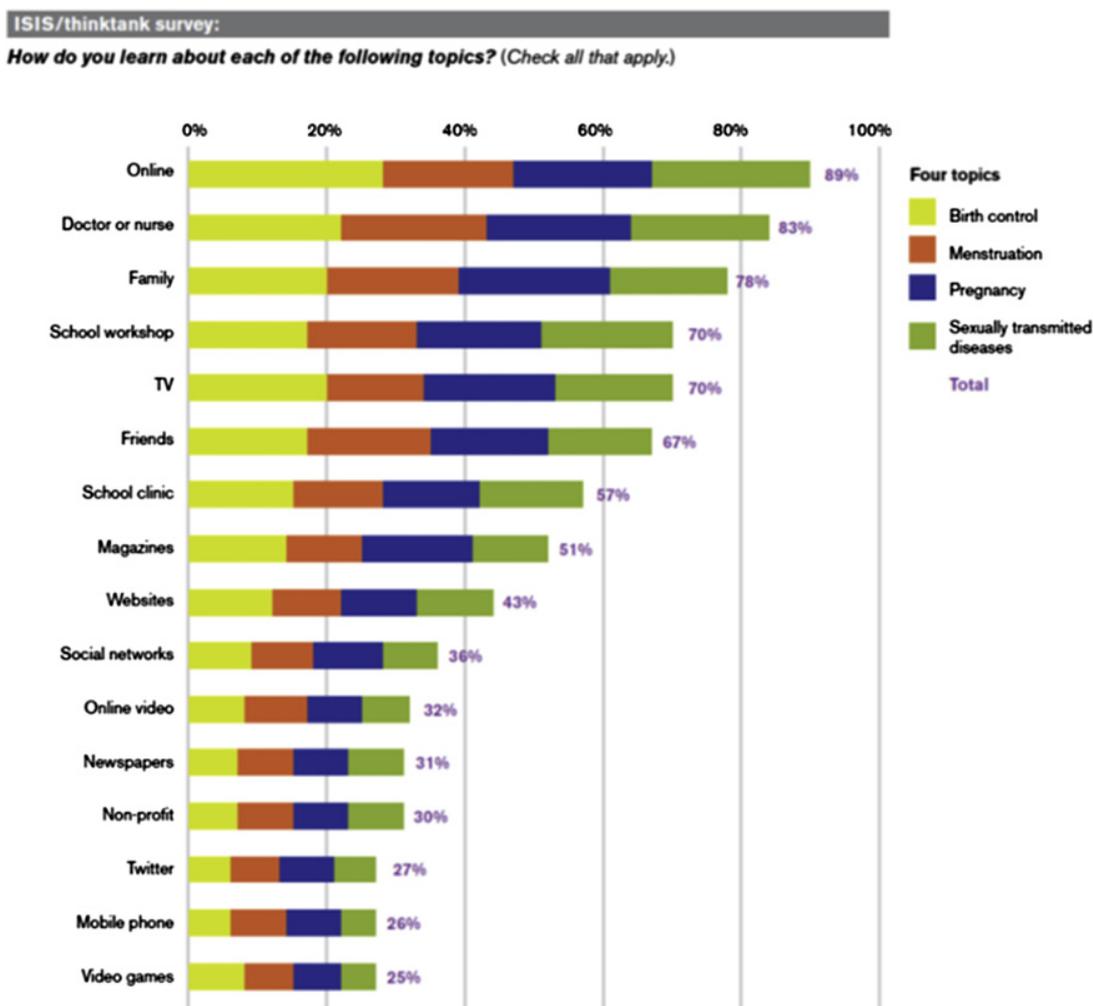


Fig. 9. Together, media now outrank parents or health professionals as the primary source of information about sex for teenagers. (From Boyar R, Levine D, Zensius N. TECHsex USA: youth sexuality and reproductive health in the digital age. Oakland (CA): ISIS, Inc.; April, 2011.)

most heavily advertised and depicted. Every year, more than 400,000 Americans die from tobacco-related causes—more than from AIDS, automobile accidents, murder, and suicide combined.<sup>176</sup> The substantial decrease in teen smoking that began in the mid-1990s appears to have come to a halt; nearly 20% of high school seniors have smoked cigarettes in the 30 days before being surveyed, and 42% of high school seniors have ever tried smoking.<sup>177</sup> Excessive alcohol consumption contributes to more than 100,000 deaths per year, including 5000 young people younger than 21.<sup>178</sup> By 12th grade, more than 70% of adolescents have used alcohol, and 54% have been drunk.<sup>177</sup> As for other drugs, 21% of 8th graders, 37% of 10th graders, and 48% of 12th graders have used an illicit substance, usually marijuana.<sup>177</sup>

**Advertising**

More than \$20 billion a year is spent advertising and promoting tobacco, alcohol, and prescription drugs in the United States.<sup>176</sup> Big Tobacco spends the lion’s share: an estimated \$10 billion per year.<sup>179</sup> The Public Health Cigarette Smoking Act, which banned advertising on radio and television, went into effect in 1971. Many people forget that cigarette smoking ads were taken off of TV in the early 1970s, not because of tobacco’s toll on society but because the tobacco lobby agreed to a ban.<sup>175,180</sup> It allowed cigarette manufacturers to put the money into marketing and promotion; advertise in alternative venues like stadiums, magazines, and billboards; and resulted in the disappearance of antismoking ads on TV. Given the demographics of smoking (1200 deaths per day, 50% of smokers begin by age 13 and 90% by age 19) it is imperative for the industry to recruit new, young smokers.<sup>181</sup> Specific age and ethnic groups are often targeted. For example, the Camel No. 9 advertising campaign in 2007 seemed custom-made for young teenage girls and was very effective.<sup>182</sup>

What impact does cigarette advertising still have, given that it is no longer on TV or radio? A meta-analysis of 51 separate studies found that exposure to tobacco marketing and advertising more than doubles the risk of a teenager beginning to smoke.<sup>183</sup> In 1994, the US Surgeon General concluded that cigarette advertising increases young people’s risk of smoking,<sup>181</sup> and the fact that the most heavily advertised brands are also the most popular would seem to confirm that.<sup>184</sup> Magazines popular with teenagers have attracted an increasing number of cigarette ads since 1965.<sup>185</sup> Numerous studies have shown that children or teens who pay closer attention to cigarette ads or who own promotional items are more likely to become smokers

<b>Table 3</b>		
<b>How good is the research linking tobacco marketing to onset of adolescent smoking?</b>		
<b>Research Question</b>	<b>No. of Studies</b>	<b>No. of Subjects Studied</b>
Are nonsmoking children exposed to and more aware of tobacco promotion?	4 prospective 12 cross-sectional	37,649
YES		
Does exposure to promotions increase the risk of initiation?	12 prospective 14 cross-sectional 2 time-series	349,306
YES		
Does a dose-response relationship exist?	2 prospective 7 cross-sectional	25,180
YES		

Data from Strasburger VC, Council on Communications and Media. Media violence (policy statement). *Pediatrics* 2010;124;1495–503; and DiFranza JR, Wellman RJ, Sargent JD, et al. Tobacco Consortium, Center for Child Health Research of the American Academy of Pediatrics. Tobacco promotion and the initiation of tobacco use: assessing the evidence for causality. *Pediatrics* 2006;117(6):e1237–48.

themselves.<sup>186–188</sup> The research is clear and convincing (**Table 3**).<sup>175,176</sup> The Family Smoking Prevention and Tobacco Control Act imposes new warnings and labels on tobacco packaging and their advertisements.<sup>189</sup> The 9 new warning labels that cigarette makers have to use on their packaging have not yet been put into effect, and are already being challenged by US tobacco companies as violating their free speech rights (**Fig. 10**).

Approximately \$5 billion a year is spent on alcohol advertising and promotion.<sup>190</sup> As with tobacco ads, alcohol ads seem “custom-made” to attract children and adolescents: funny scenes, sexy models, talking animals (**Fig. 11**).<sup>175,191</sup> Unlike tobacco advertising, alcohol advertising faces few restrictions, and young people see an average of 2000 ads annually.<sup>192</sup> Between 2001 and 2009, teenagers were actually exposed to more alcohol advertising on TV than adults: an increase of 71%, largely because of the advertising of distilled spirits and the presence of alcohol ads on programs popular with teenagers.<sup>193,194</sup> This has occurred despite the industry’s 2003 promise to advertise only when the underage audience comprises less than 30% of the total viewing audience. Young people are 22 times more likely to see an alcohol ad than a “responsibility” ad warning against underage drinking or impaired driving.<sup>193</sup> On the other hand, the industry also pledged to observe the same 30% figure with magazine advertising, and from 2001 to 2008 it did achieve that goal: adolescent exposure to alcohol advertising in magazines decreased by 48%.<sup>195</sup> Many studies have shown that exposure to alcohol advertising results in more positive beliefs about drinking and is predictive of underage drinking.<sup>196–201</sup>

Many experts feel that prescription drug advertising also contributes to adolescent drug use.<sup>176,202</sup> Children and teenagers get the clear message that there is a pill to cure all ills, a pill for every occasion (even sexual intercourse). Nearly \$4 billion annually is spent on prescription drug advertising,<sup>203</sup> and drug companies now spend more than twice as much money on marketing as they do on research and development.<sup>204</sup> The United States and New Zealand are the only countries in the world that allow prescription drugs to be advertised.



**Fig. 10.** The FDA is trying to experiment with new and more graphic cigarette package labels, and the CDC is initiating a more graphic public health campaign. The FDA’s efforts are being vigorously opposed by the tobacco industry. The proposed new labels are available at: [http://www.fda.gov/TobaccoProducts/Labeling/ucm259214.htm#High\\_Resolution\\_Image\\_Formats](http://www.fda.gov/TobaccoProducts/Labeling/ucm259214.htm#High_Resolution_Image_Formats). (From US food and Drug Administration. tobacco products: labeling. Available at: <http://www.fda.gov/TobaccoProducts/Labeling/default.htm>.)



**Fig. 11.** Tobacco and alcohol ads seem custom-made to attract teenagers. Such ads make smoking cigarettes and drinking alcohol seem like normative behavior.

### ***Drugs in Entertainment Media***

Regarding smoking in the movies, there is both good news and bad news. The good news is that smoking in the movies is decreasing. A number of studies in the late 1990s and early 2000s had documented that most movies popular with teenagers contained images of smoking.<sup>205,206</sup> Even G-rated movies for young children were found to be rife with smoking.<sup>207</sup> But the latest content analyses shows that since 2005, there has been a decline<sup>208,209</sup>: the percentage of all top-growing movies that did not show tobacco use exceeded 50% for the first time in 2009.<sup>209</sup> The bad news is that in 2009, more than half of PG-13 movies still contained scenes of tobacco use,<sup>209</sup>

and research is now showing that exposure to scenes of movie smoking may be the leading predictor of young teens' initiation of smoking (**Fig. 12**).<sup>210–217</sup> Young people who witness a lot of movie smoking are 2 to 3 times more likely to begin smoking.<sup>212</sup> Some researchers estimate that more than half of all smoking initiation is caused by exposure to smoking in movies.<sup>210,213</sup> Preteens whose parents forbid them from seeing R-rated movies are less likely to begin smoking (or drinking).<sup>17,218</sup> Those who study adolescent risk-taking argue the importance of understanding parenting styles, including monitoring behaviors in general, to understand children's access to media and time spent with media.<sup>219</sup>

Viewing scenes of smoking on TV may fall into the same category as viewing smoking in the movies, although there are no longitudinal studies yet to prove this. A content analysis of top-rated TV shows for teenagers during the fall 2007 season did show that 40% of TV shows had at least 1 depiction of tobacco use, resulting in nearly 1 million youth exposed to smoking scenes for the shows that were studied.<sup>220</sup> Movie trailers shown on TV are also a rich source of smoking scenes,<sup>221</sup> and one study has shown that such trailers increase the attractiveness of smoking among teens who have already experimented with cigarettes.<sup>222</sup>

Alcohol remains the number 1 drug portrayed on American television, however. A study of the top 10 TV shows from 2004 to 2006 found that one-third of episodes examined featured alcohol use.<sup>223</sup> On MTV, teenagers can see alcohol use every 14 minutes.<sup>224</sup> Teens who typically watch popular teen reality shows like *Jersey Shore*,



**Fig. 12.** Movie star smoking has always glamorized smoking for children, teenagers, and adults. Many old-time movie stars (eg, Lucille Ball, John Wayne, James Dean, Humphrey Bogart) smoked onscreen and off. Research studies now show that viewing scenes of movie smoking is one of the key factors in the onset of adolescent smoking.<sup>207–217</sup>

*Teen Mom*, *16 and Pregnant*, or teen dramas like *Skins* or *Gossip Girl* were nearly twice as likely to use alcohol in one recent national survey of more than 1000 teenagers.<sup>225</sup> Popular music is also a source of alcohol references, especially rap music. From 1979 to 1997, songs with alcohol references increased from 8% to 44%.<sup>58</sup> Popular movies are also filled with alcohol use; only 2 of the 40 highest-grossing movies in one study did not contain scenes of alcohol use.<sup>226</sup> Again, the impact from the research is clear: exposure to scenes of drinking in mainstream media is strongly predictive of drinking onset and binge drinking in adolescents.<sup>194,227-229</sup>

Movies are powerful influences: one study found that teenagers who watch more than 3 R-rated films per month are 5 times more likely to drink alcohol than teens who watched none<sup>230</sup>; and in one intriguing study, 2- to 6-year-olds who were asked to shop in a make-believe store were 5 times more likely to buy beer or wine if they had been allowed to see PG-13 or R-rated movies.<sup>231</sup> The research includes correlational studies,<sup>199,227</sup> experimental studies,<sup>231,232</sup> and longitudinal studies.<sup>197,226-229</sup> As with media violence and sex in the media, *context matters*. In the case of alcohol (and other drugs), popular teen TV shows and movies invariably show drug use as being socially acceptable and consequence-free, and most characters are not even given the choice of whether to accept or reject the drugs being offered.<sup>233</sup>

Despite public perceptions, illegal drugs are rarely shown on TV, with the exception of cable shows like Showtime's *Weeds* (marijuana) and AMC's *Breaking Bad* (methamphetamine).<sup>234</sup> Even in movies, illicit drugs are not all that common, other than marijuana, which seems to be making a comeback in R-rated movies like the *Harold and Kumar* series, *Pineapple Express* (2008), *Due Date* (2010), and *Bad Teacher* (2011).<sup>235</sup> A Columbia University study found that viewing R-rated movies was associated with a sixfold increased risk of trying marijuana.<sup>230</sup> Hollywood filmmakers do not seem to understand that movies can function as a "super-peer" for teens<sup>33</sup> and that humor tends to undermine normal adolescent defenses against drugs and legitimizes their use.<sup>175</sup> Similarly, teens who listen to a lot of music are exposed to lyrics about marijuana. In one study of nearly 1000 ninth graders, the average listener heard 27 marijuana references per day; those most heavily exposed were more likely to have used marijuana.<sup>236</sup>

Research on the possible impact of new media on adolescent drug use is just beginning and mostly consists of content analyses. A study of all Web pages viewed by 346 14- to 17-year-olds during a 30-day period found that of the 1.2 million pages they viewed, 1916 pages had protobacco content, 1572 had antitobacco content, and 5055 pages had indeterminate content. Most of the tobacco content was found on social networking sites.<sup>237</sup> A content analysis of 400 randomly selected MySpace profiles discovered that 56% contained references to alcohol.<sup>238</sup> In a qualitative study, teens acknowledge that this constitutes a potential type of peer pressure.<sup>239</sup> Teens can also buy alcohol online,<sup>240</sup> but effective in October 2012, the Food and Drug Administration (FDA) must issue regulations to prevent the sale of tobacco products to underage youth online. One new correlational study suggests further research is needed: compared with teens who spend no time on social networking sites, teens who do were found to be 5 times likelier to use tobacco, 3 times likelier to use alcohol, and twice as likely to use marijuana.<sup>225</sup> Even more concerning, 40% of more than 1000 teens surveyed nationwide reported seeing pictures of kids getting drunk, passed out, or using drugs on social networking sites.<sup>225</sup>

## OBESITY

In the 2011 National Poll on Children's Health, obesity was the number 1 health problem that parents worry about.<sup>241</sup> Given the current epidemic of obesity, not just

in the United States but worldwide, any factor that might influence obesity would seem to be well worth investigating. Obesity represents a clear danger to the health and well-being of children and adolescents. When the producers of *Taking Woodstock* began casting for their movie about the 1969 concert, they had great difficulty finding extras who were as thin as the original concert-goers.<sup>242</sup> The prevalence of obesity has doubled in the past 3 decades, and there are now more overweight and obese adults in the United States than normal-weight adults.<sup>243</sup> Rates of obesity are increasing in nearly every country.<sup>244</sup> Global diabetes rates have doubled from 1980 to 2008; an estimated 350 million people worldwide now have diabetes.<sup>245</sup> The cost to American society is an estimated \$168 billion a year, which is nearly 17% of all medical costs.<sup>246</sup>

### **The Role of Media**

---

Considerable research is now finding that screen time plays an important role in the etiology of obesity.<sup>247,248</sup> A remarkable number of long-term studies in various countries are particularly persuasive, finding a connection even when all other known factors contributing to obesity are controlled for:

- Researchers in Dunedin, New Zealand, followed 1000 subjects from birth to 26 years of age and found that average weeknight TV viewing between the ages of 5 and 15 was strongly predictive of adult body mass index (BMI).<sup>249</sup>
- A 30-year study in the United Kingdom found that a higher mean of daily hours of TV viewed on weekends predicted a higher BMI at age 30, and for each additional hour of weekend TV watched at age 5, the risk of adult obesity increased 7%.<sup>250</sup>
- A study of 8000 Scottish children found that viewing more than 8 hours of TV per week at age 3 was associated with an increased risk of obesity at age 7.<sup>251</sup> Similarly, a study of 8000 Japanese children found that TV viewing at age 3 resulted in a higher risk of overweight at age 6.<sup>252</sup>

Large cross-sectional studies from both the United States<sup>253–259</sup> and other countries<sup>260–263</sup> have found similar results, although 1 US study and 1 Chinese study have suggested that TV advertising rather than programming is what contributes to obesity.<sup>257,264</sup> The presence of a bedroom TV exacerbates the problem, sometimes even independently of physical activity level.<sup>16,265–268</sup> One study found that teenagers with a bedroom TV spent more time watching TV, less time being physically active, ate fewer family meals, and consumed healthier diets than teens without a bedroom TV.<sup>266</sup> Studies have also found a link between excessive screen time and hypercholesterolemia,<sup>269</sup> hyperinsulinemia,<sup>270</sup> insulin resistance,<sup>271</sup> type 2 diabetes,<sup>272</sup> metabolic syndrome,<sup>271,273</sup> hypertension,<sup>274</sup> and even early mortality.<sup>275</sup>

So the connection between screen time and obesity is clear, but the exact reasons why are not. Possible mechanisms include (1) increased sedentary activity along with displacement of more active pursuits, (2) the impact of food advertising on children's food and beverage choices, (3) unhealthy eating behaviors while watching TV and learned from TV, and (4) interference with normal sleep patterns.

### **Sedentary Activities**

---

One would think that the *displacement effect* (ie, if a child is sitting passively in front of a TV set or computer screen, he or she is not outside playing) might play a key role, but the research is conflicted on this point. Many studies have found that physical activity decreases as screen time increases,<sup>256,276</sup> but other studies have not.<sup>277,278</sup> A recent

study of more than 72,000 schoolchildren from 34 countries found that nearly one-third are spending 3 hours a day or more watching TV or on the computer.<sup>279</sup> The problem could be that sedentary children and teenagers may remain sedentary even if screen time is not an option,<sup>278,280,281</sup> or that researchers' measures of physical activity may be too imprecise.<sup>282</sup> Nevertheless, the reverse seems to hold true: decreasing screen time does help to prevent obesity.<sup>283–285</sup> Several studies have looked at newer video games that involve exercise and seem to offer some hope (eg, *Dance Dance Revolution* and *Wii Sports*).<sup>286–288</sup> Energy expenditure during these games is equivalent to moderately paced walking.<sup>289</sup>

### **Food Advertising**

---

In 2009, the fast-food industry alone spent \$4.2 billion on advertising.<sup>290</sup> More than 80% of all ads in children's programming are for fast food or snacks.<sup>291,292</sup> Young people see an average of 12 to 21 food ads per day (4400–7600 ads per year), yet fewer than 165 ads that promote fitness or good nutrition.<sup>293</sup> Movies may also be a "hidden" source of product placements for unhealthy foods: in a study of 200 movies from 1996 to 2005, researchers found that 69% contained at least 1 food, a total of 1180 product placements were identified, and most of them were for energy-dense, nutrient-poor snacks.<sup>294</sup> Increasingly, online advergames (**Fig. 13**) and advertising are targeting young children as well.<sup>295,296</sup> A study of the top 5 brands of food and beverages found that all had Internet Web sites, 63% had advergames, 50% used cartoon characters, and 58% had a designated children's area.<sup>297</sup> Fewer than 3% of the games actually educate children about nutrition,<sup>298</sup> yet this could be a creative use of new technology to promote healthier food choices.<sup>299</sup>

The research is clear that children and teens who watch a lot of TV tend to consume more calories, eat higher-fat diets, drink more sodas, and eat fewer fruits and vegetables.<sup>257,300</sup> Perhaps the most intriguing study to document the effectiveness of food advertising involved 63 children who tasted 5 pairs of identical foods and beverages (eg, French fries, carrots, milk) from unbranded packaging versus McDonald's packaging. The children strongly preferred the McDonald's foods and drinks, even though all of the food and drinks were absolutely identical.<sup>301</sup>

In 2011, a working group comprising the Centers for Disease Control and Prevention, FDA, US Department of Agriculture, and Federal Trade Commission was convened to establish voluntary guidelines for marketing food to children.<sup>302</sup> The guidelines produced cover a wide array of marketing, from television to toys in fast food meals to Internet sites and social media and would severely limit advertising of foods that exceeded limited amounts of added sugar, saturated or trans fats, and sodium.<sup>303</sup> So far, food manufacturers have rejected the proposed guidelines in favor of their own, weaker guidelines.<sup>303</sup> It is highly debatable whether self-regulation will work in a multibillion-dollar industry that relies so heavily on child and adolescent consumption of unhealthy foods.<sup>304–306</sup>

### **Snacking Behavior**

---

Some research suggests that viewing TV while eating actually suppresses satiety cues, leading to overeating.<sup>307</sup> Several studies have documented that eating while viewing leads to unhealthy practices:

- A study of 5000 Midwest middle and high school students found that high TV use is associated with more snacking and consumption of soda and fast food.<sup>308</sup>
- Similar studies of more than 162,000 preteens and teens in Europe correlated TV viewing with increased snacking.<sup>309</sup>



Fig. 13. (Top) Increased consumption of soda has contributed to the problem of obesity. (Bottom) Online advergames are increasingly popular with young children.

- A longitudinal study of 564 middle school students and 1366 high school students found that TV viewing predicted poorer dietary intake five years later.<sup>310</sup> (Barr-Anderson, 2009)
- Even experimental studies show this effect: a study of college students found that they take in an additional 163 kcal/day when they watch TV.<sup>311</sup>
- In a study of 548 students in 5 public schools near Boston, researchers found that each hour increase in TV viewing resulted in an additional 167 kcal/day being consumed.<sup>312</sup>

Other research suggests that viewers make unhealthy food choices because of the ads that they see, not the content of TV programming.<sup>257,313</sup> A prospective study of 827 third graders followed for 20 months found that total TV time predicted future requests for advertised foods and drinks.<sup>314</sup>

### **Sleep**

---

One of the newest areas of research involves the impact of sleep on a variety of different health concerns, including obesity.<sup>315–317</sup> For example, a longitudinal study of young children in the United Kingdom found that shorter sleep duration at age 30 months predicted obesity at 7 years.<sup>318</sup> Significantly, several studies have now implicated TV viewing with a loss of sleep.<sup>319,320</sup> A longitudinal study of adolescents in New York found that viewing 3 or more hours per day of TV doubled the risk of difficulty falling asleep compared with watching less than 1 hour per day.<sup>319</sup> Later bedtimes and less sleep may be associated with a greater risk of obesity.<sup>315,318</sup> Again, the mechanisms are unclear: sleep loss may lead to increased snacking,<sup>321</sup> fatigue and increased sedentary activity,<sup>322</sup> or metabolic changes.<sup>323</sup> It is also possible that the light of a bedroom TV screen at night may interfere with melatonin release, which, in turn, interferes with sleep.<sup>324</sup>

### **BODY IMAGE AND EATING DISORDERS**

A new report on eating disorders has found that hospitalizations surged 119% between 1999 and 2006 for children younger than 12.<sup>325</sup> Especially for girls, the media may play a crucial role in the formation of young people's body self-image; may be responsible for creating unrealistic expectations, body dissatisfaction; and may even contribute to the development of eating disorders.<sup>326–329</sup> For example, a large study of nearly 7000 9- to 14-year-olds found that girls who want to look like TV or movie stars were twice as likely to be concerned about their weight, to be constant dieters, or to engage in purging behavior.<sup>330</sup> For preteen and teenage girls, fashion and beauty magazines are particularly adept at displaying role-models with impossibly thin bodies (**Fig. 14**).<sup>331</sup> A study of nearly 3000 Spanish 12- to 21-year-olds over a 19-month period found that those who read girls' magazines had a doubled risk of developing an eating disorder.<sup>332</sup> A longitudinal study of 315 preteens found that TV exposure significantly predicted disordered eating a year later for girls.<sup>333</sup> And teenage girls on the Pacific island of Fiji had virtually no problems with eating disorders until American TV shows were introduced. Two years later, 75% of the teen girls surveyed reported feeling "too big or fat" and 15% had abnormal Eating Inventory scores.<sup>334</sup>

New media are contributing to this problem as well. There are now more than 100 pro-anorexia Web sites (pro-ana sites) that not only encourage disordered eating but offer specific advice on purging, severely restricting caloric intake, and exercising excessively.<sup>335</sup> And a follow-up study in Fiji found that social network media exposure was associated with eating pathology in a sample of 523 young girls.<sup>336</sup> Clearly, the media can and do play a crucial role in the development of body self-image.<sup>326</sup>



**Fig. 14.** Fashion magazine advertisement.

Although there are insufficient data to state that the media *cause* eating disorders, media exposure can certainly be considered as a significant risk factor.<sup>337</sup>

### **OTHER CONSIDERATIONS**

Many other aspects of media's impact on child and adolescent health have been studied. In most cases, the samples studied are correlational and not longitudinal. Hence, associations can be inferred but not causation.

#### ***Infant Media***

There are now at least 14 studies implicating infant screen time with language delays<sup>338–351</sup> and no studies conclusively showing that exposure to TV or infant videos alone for babies younger than 2 years accelerates their learning.<sup>352</sup> Only 2 studies thus far have shown new word acquisition from viewing TV or infant videos, and this was likely because of the influence of co-viewing by parents.<sup>353,354</sup> The most likely explanation is that the infant brain is “plastic” and responds to environmental stimuli, parents being the most important, by far; but also babies can discriminate between live human beings and actors on-screen.<sup>355</sup>

#### ***Attention-Deficit Disorder***

Several studies have raised the possibility of a connection between TV viewing and attention-deficit disorder (ADD) or other learning problems.<sup>356–358</sup> The initial study in

2001 found an association between daily hours of TV viewing at ages 1 to 2 years and subsequent attention problems at age 7.<sup>359</sup> One subsequent study found the opposite: that healthy children demonstrate more cognitive impairment after watching TV than children with ADD.<sup>359</sup> A recent study also found that young autistic children watch more TV than other children.<sup>360</sup> This is currently a hot topic of investigation, and no cause-and-effect conclusions are possible yet; however, it is possible to conclude that excessive screen time and the presence of a bedroom TV have a negative impact on academic performance.<sup>361–367</sup>

### ***Depression and Suicide***

---

Studies have linked media coverage of and portrayals of suicide with an increase in actual suicides, a type of “suicide contagion” that affects teens far more than adults.<sup>368–370</sup> Even sensitively made-for-TV movies have resulted in an increase.<sup>368,369</sup> The Centers for Disease Control and Prevention actually issued guidelines in 2003 for reporting suicide in the media, which asks TV stations and newspapers to avoid sensationalizing suicides (eg, Kurt Cobain) or glorifying the person involved.<sup>371</sup>

Although no recent studies have been found involving TV or movies, major publicity now surrounds suicides precipitated by Internet bullying.<sup>371,372</sup> Excessive media use may also be a marker for depression<sup>373</sup> and has been associated with increased psychological distress in children and preteens.<sup>374–378</sup>

## **THE POSITIVE ROLE OF MEDIA IN THE LIVES OF CHILDREN AND ADOLESCENTS**

Although much of this article has focused on research emphasizing the deleterious consequences of inappropriate and excessive media use, it is also critical to acknowledge the many positive roles media can play in children’s healthy development (**Fig. 15**). A 1986 meta-analysis of studies investigating the effects of television on children concluded that positive effects of prosocial TV viewing were twice as strong and more enduring than antisocial effects of violent TV.<sup>379</sup> An update of the meta-analysis, conducted in 2005 with research released since the original study, also found consistently positive effects of prosocial content on children’s behavior.<sup>380</sup> Videogames have also produced positive prosocial outcomes. In one experiment, college students who were assigned to play prosocial games were more helpful and less hurtful to a partner in a puzzle task, relative to those who played neutral or violent games.<sup>63</sup> A longitudinal survey conducted with 5th-, 8th-, and 11th-grade students in Japan found that students who played more prosocial games initially reported more prosocial behaviors 4 months later.<sup>63</sup>

Although heavy media use is implicated in obesity, relatively new products have created an opportunity to combine exercising with gaming. “Exergames” offer children and adolescents opportunities to engage in home-based exercise; and many schools have designed physical education classes around them. Although it is not yet clear whether games like *Dance Dance Revolution* or *Wii Fit* can be effective in weight loss,<sup>381,382</sup> there does seem to be some potential to use games as a positive force for health.<sup>383</sup> In one small study, 14 adolescents, 15 young adults, and 13 older adults were brought to a laboratory to compare the physiologic cost and enjoyment of playing an exergame (*Wii Fit*), a handheld inactive video game, and brisk treadmill walking and jogging. As might be expected, the physiologic cost of exergaming on *Wii Fit* was significantly greater than handheld inactive video gaming but lower than treadmill exercise. However, as the authors point out: “the acute enjoyment response derived from *Wii balance* and *Wii aerobics* was comparable if not greater than handheld inactive

27 9 DAILY NEWS, TUESDAY, SEPTEMBER 5, 1959

OWN A  
**Motorola**  
AND YOU KNOW YOU  
OWN THE BEST

# HOW TELEVISION BENEFITS YOUR CHILDREN

**Motorola, leader in television, shows how TV can mean better behavior at home and better marks in school!**



**Home, sweet TV home!** Peace! Quiet! No more "every day riots" ... with television keeping small fry out of mischief ... and out of mother's hair. And that's just one of many TV blessings. "Taking away television from children who 'act up' is a punishment that really works," writes an authority on child psychology. "The very thought of missing some pet program turns little boys into lambs. And, incidentally, those favorite programs in the late afternoon are the world's finest magnet for getting tardy youngsters home on time."



**Gets homework done—promptly!** The simple rule "homework first—television second" has solved the problem in thousands of homes ... has made children more interested in school work. "Television," says the *New York Times*, "can be enjoyed in healthy moderation in the same way as sports or movie-going, but only the mother and father can make certain this will be the case."



**Will television strengthen family ties?** Educators, religious and social workers all agree it can be one of the strongest forces in America for bringing the family together to enjoy good, clean entertainment right in the home. Parents can select their children's "TV diet" from a wide variety of wholesome programs.



Motorola's leadership in cabinet design as well as performance is recognized with the 1959 Families Academy Gold Medal Award. Typical example of Motorola ingenuity is this Table Model 377K. Clear, steady 16" picture, only 2 simple controls, Ed-in-Restroom, price only \$299.95. View it at your dealer's along with other beautiful Motorola models from \$189.95 to \$469.95. Then let a Motorola demonstration in your home show you how much TV enjoyment can benefit your own children.



# Motorola

TELEVISION

Fig. 15. Example of positive role advertisement.

gaming and treadmill exercise, especially in adolescents, suggesting individuals may be more likely to adhere to sustained light to moderate intensity exergaming.”<sup>384(p399)</sup>

Media, if used properly, can introduce children to education and learning even when they come from families with very few resources. *Sesame Street*, which is perhaps the world’s most carefully studied show, was designed to close the “knowledge gap” between children who have the financial resources to attend preschool and those who do not.<sup>339</sup> It has been wildly successful both in reaching its target audience of

at-risk preschoolers but also in setting the standard for careful formative and summative research to track the program's effectiveness.<sup>339</sup> A longitudinal study tracking children from preschool through high school found that children who viewed *Sesame Street* and other educational preschool programs arrived at school more "ready to learn" and that these gains persisted through high school, even after controlling for individual and family variables that are known to affect educational success.<sup>385</sup> Another well-known television program, *Blue's Clues*, was designed to focus on preschoolers' cognitive problem solving. In a 2-year program evaluation, researchers followed preschoolers who were regular viewers of the show and preschoolers who were not because the program did not air in their town of residence. The 2 groups were equivalent in their problem solving at the start of the study. But at the end of the 2-year period, regular viewers of *Blue's Clues* outperformed their nonviewing peers in many measures, and were more successful and systematic in their problem solving.<sup>386</sup>

New media technologies give youth the opportunity to create their own expressions of individuality, whether through social networks like Facebook or file-sharing sites like YouTube.<sup>7</sup> In her research on adolescent use of social networks, danah boyd explains that "teens are drawn to social media collectively and ... individuals choose to participate because their friends do. The appeal is not technology itself—nor any particular technology, but the presence of friends and peers."<sup>387(pp294–295)</sup> New media allow adolescents to experience community in a time of life when they often feel unmoored. The It Gets Better Project, a Web site created after a series of suicides by youth who had been bullied over their sexuality, gives lesbian, gay, bisexual, and transgender (LGBT) youth the space to tell their stories and to hear the encouragement of LGBT adults who have successfully navigated the turbulent teen years (<http://www.itgetsbetter.org/>). As media experts Heather Kirkorian, Ellen Wartella, and Dan Anderson conclude "The influences can be both for good and for ill. ... Ultimately, however, the question is whether society has the ability and will to enhance the positive aspects of media and reduce the negative."<sup>388(p54)</sup>

## SOLUTIONS

The potential for media to play a beneficial role in the lives of children and youth has not been fully realized, and strategies for reducing the negative effects have not been optimized. Clearly, children and adolescents learn from the media (**Fig. 16**).

## PARENTS

For years, the American Academy of Pediatrics<sup>389</sup> (AAP) has recommended that parents

1. Limit total screen time for children older than 2 years to no more than 1 to 2 hours per day
2. Avoid screen time for children younger than 2 years
3. Keep children's bedrooms free of screen media (including TVs, computers, iPads, cell phones)
4. Co-view media with their children and teenagers and discuss the content.

Parental efforts to interpret, elaborate, and provide supplemental information on topics introduced by television have been found to be successful in countering negative or harmful content.<sup>6</sup> As the AAP states,<sup>80</sup> co-viewing with children and teens can effectively replace "the big talk" about sex and drugs. Although 65% of 1000 parents surveyed nationally in a recent study reported that they "closely monitor" their

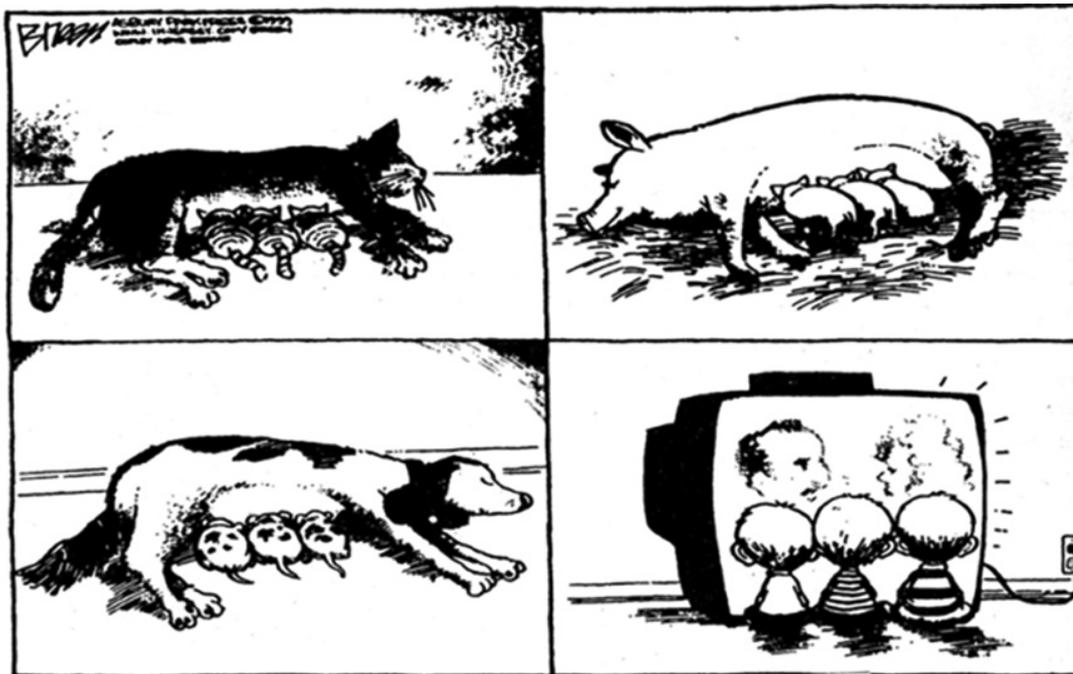


Fig. 16. (Copyright © Steve Breen/Creators Syndicate. Used with permission.)

children's media habits,<sup>390</sup> parents typically report that their children use less media than children themselves report.<sup>391</sup> Therefore, an important first step would be for health care providers to encourage parents to be more cognizant about their children's media time. Parents should be told why the AAP recommends limited time with screen media and emphasize the value of play for babies and toddlers, the importance of family dinners with the TV off, and the importance of unstructured time so that young children's imagination and creativity will be stimulated. A recent study found that interventions targeting the preschool age group might be most effective.<sup>392</sup> Parents also need to avoid exposing young children to PG-13- and R-rated movies,<sup>229,393,394</sup> and should set clear guidelines for online activities. As a corollary, parents should be mindful of their own media practices, as studies have shown that the strongest predictor of children's heavy media use is parents' heavy media use.<sup>391,395</sup>

For new technology, The AAP has launched a new parent-oriented Web site (<http://www.healthychildren.org/English/family-life/Media/Pages/default.aspx>) that provides suggestions for parents in dealing with topics as diverse as cyberbullying, food ads on TV, and media education. A recent clinical report from the AAP also advises parents to do the following<sup>396</sup>:

- Talk to their children and adolescents about their online use and the specific issues involved (eg, cyberbullying, sexting, advergaming, and so forth)
- Become better educated about the many new technologies young people have access to
- Supervise their children's online activities directly, as opposed to remote monitoring with "Net-nanny"-type programs.

## PRACTITIONERS

Because the media potentially have an impact on virtually every concern that parents and pediatricians have about children and adolescents, from aggressive behavior, early sexual activity, substance abuse, obesity, to school performance, a minute or 2

of counseling on media use would be time well spent. Yet a 2004 survey of 365 pediatricians revealed that only half recommend limiting screen time according to the AAP recommendations, and half said they were not interested in learning more about media influences on their patients.<sup>44</sup> One study found that just a minute or 2 of office counseling could result in nearly 1 million children adhering to the AAP guidelines of 2 hours of screen time per day.<sup>397</sup> Clinicians who see children need to understand that discussing children's media use may be as helpful to children's healthy development as explaining the importance of a bicycle helmet or the positioning of a car seat, particularly if a child is showing signs of school difficulty, aggressiveness, disordered eating, or poor sleep patterns. The following 2 questions are useful to pose to parents in the clinical setting:

1. How much time per day does the child or teenager spend with entertainment media?
2. Is there a television set or any electronic device that allows an Internet connection in the child's bedroom?<sup>398,399</sup>

Parents should be encouraged to avoid putting electronic devices in the child's bedroom to begin with or to remove them once they are there. For households with teenagers, the computer with an Internet connection is best placed in a living room or den where there is heavy adult traffic. Traditionally, continuing medical education programs for physicians have been planned along subspecialty lines; however, given that the media have an impact on virtually every concern that clinicians and parents have about children and adolescents, physicians need more information about media effects, such as the impact on teenage sex, drug use, suicide, and school achievement. In February, 2012, the American Academy of Pediatrics announced that Children, Adolescents, and Media would become part of its Strategic Plan for the next 2–3 years.

## SCHOOLS

Schools have not kept pace with modern media, especially in violence prevention, drug prevention, and sex education programs. With the amount of sexual suggestiveness currently displayed on television and in movies, schools no longer have any excuse for not providing comprehensive school-based sex education programs for children and adolescents, including full discussions of contraception<sup>400</sup> and how sex and sexuality are portrayed in the media. Similarly, drug education programs must progress beyond scare tactics to incorporate principles of media education, teaching young people how to deconstruct alcohol and tobacco ads, and, thereby, become more resilient. Media education is now crucial. A century ago, to be "literate" meant that one could read and write; in 2009 it means having the ability to decipher a bewildering array of media and make sense of them all. Several countries, including the United Kingdom, Canada, and Australia, mandate such education in their schools.<sup>401</sup> Few American schools teach media education, but studies have shown that it may be useful in mitigating harmful media effects.<sup>165,173,390,401–404</sup> Even the use of new technologies can be affected through media education; one study revealed that teenagers can be responsive to messages about the dangers of posting sexual references in their profiles on social networking sites, for example, and will alter their online behavior accordingly.<sup>173</sup> Schools need to develop programs to educate young people about how to use new technology wisely, as well as school policies to deal with cyberbullying and sexting.<sup>405</sup>

## ENTERTAINMENT INDUSTRY

Given the tremendous positive potential of mass media to provide millions of people with accurate and important health information, the entertainment industry must

become more public health oriented than it currently is. The United States continues to have the highest teenage pregnancy rate in the Western world.<sup>83</sup> Given this fact, increasing responsible sexual content in mainstream media and advertising contraceptives widely would seem to be an urgent public health goal.<sup>81</sup> Several studios have agreed to add antismoking advertisements before feature films on new DVDs, and Disney no longer permits smoking in its movies.<sup>406</sup> Industry ratings systems have sometimes been confusing for parents, although most have indicated that they rely on the information.<sup>390</sup> For example, several national surveys of parents revealed that only 10% of parents understand that the television rating “FV” indicates “fantasy violence.”<sup>8,395</sup> One major help for parents would be a universal ratings system for all media instead of the “alphabet soup” that currently exists separately for television, movies, and video games.<sup>8</sup>

### ADVERTISING INDUSTRY

Currently, the United States spends \$250 billion per year on advertising,<sup>407</sup> yet advertisers continue to claim that they are only trying to influence brand choice, not consumption. There are good data that show that advertising does increase consumer spending by children (AAP) and the products most advertised to children may not be the healthiest for them (eg, junk food and fast food),<sup>408</sup> whereas other products are woefully underadvertised (eg, healthy foods, contraceptives).<sup>81,408,409</sup> Given the new potential of digital advertising to reach an increasingly younger audience, it seems vital to establish appropriate advertising ethics for what can and cannot be advertised to certain age groups.<sup>296</sup> In particular, with the epidemic of obesity now spreading worldwide, some experts have suggested that limits be placed on advertising junk food and sugary beverages to children and adolescents,<sup>300,410–412</sup> a move that, in the United Kingdom, has resulted in a decrease in young audiences’ exposure to products linked with childhood obesity.<sup>413</sup> Researchers in Australia have also documented that advertising healthy foods to children can increase positive attitudes toward the food and children’s willingness to choose healthy food as a snack.<sup>414</sup>

### RESEARCHERS

Many current studies of risky behaviors among adolescents, including drug use, sexual activity, and eating disorders, completely ignore the possibility of media influence.<sup>132</sup> Researchers need to incorporate measures of media use (and impact) into their studies of child and adolescent behavior. Longitudinal studies with children and adolescents representative of the population are needed to better understand the cumulative effect of media on the developing child and the differential effects of the media on distinct subpopulations of children.<sup>411</sup> As well, researchers need to stay abreast of evolving media technologies such as iPad “apps,” both to document how they are used and by whom, as well as to determine their impact on the healthy development of children. With newer technology, researchers also specifically need to consider<sup>415</sup> the following:

1. The need for longitudinal research to examine the causal relationships between on-line participation and engaging in risk-related behaviors, such as aggression and sexual behaviors.
2. The major risk factors (ie, individual, environmental, social) that are related to a child or adolescent “acting” on this Internet exposure.

3. The need for specific research on children younger than 12, given their increasing use of the Internet. In particular, there is a strong need for studying those younger than 6 who have less capacity to “cope” with riskier online content.
4. Research on expanding platforms, such as mobile phones and virtual game environments, as well as peer-to-peer exchanges. Research on social networking sites is just now beginning to proliferate.
5. Increased research on public health issues, such as self-harm, suicide, drugs, and addiction.

## GOVERNMENT

In the United States, Americans often experience a tension between 2 highly valued principles: protecting the free speech rights of media makers and advertisers and protecting the health and well-being of the nation's most vulnerable populations: children and adolescents. This has often meant that we regulate by “raised eyebrow”; that is, if Congress becomes concerned about particular content or practices, the industry offers to self-regulate. But the recent effort by the Working Group in Washington to rein in advertising of junk food and fast food shows that some industries are not even willing to engage in substantial self-regulation.<sup>416</sup> What is also lacking is often the follow-through needed to determine if a particular industry's self-regulatory practices are even effectively addressing the concerns.<sup>292</sup> For example, Coca-Cola has pledged to refrain from advertising to children; yet, the average child sees nearly 4 product placements of Coke on primetime TV every week.<sup>417</sup> Similarly, when regulations are “on the books,” such as the Children's Television Act of 1990 (which mandates 3 hours per week of educational or informational programming for children on broadcast television networks), federal agencies do not rigorously enforce them.<sup>418</sup> With the explosion in digital media, it is time to revisit the roles of federal regulatory agencies, such as the Federal Communications Commission and the Federal Trade Commission.<sup>419</sup> It is critical for research experts and health care professionals to contribute to these deliberations.

Government could also provide more funding for media education efforts and for positive media content that encourages healthy lifestyles and choices (such as the Ready to Learn programs for preschoolers from the Department of Education). Through the National Institute of Mental Health, the government could also issue a new omnibus report to update current knowledge of media effects on children and adolescents and to stimulate new research efforts. The last such report was in 1982, well before the Internet, cell phones, and interactive advertising were even available. Amazingly, the government funds very little research on either traditional media or new media.

## SUMMARY

During the past 50 years, thousands of research studies have revealed that the media can be a powerful teacher of children and adolescents and have a profound impact on their health. The media are not the leading cause of *any* major health problem in the United States, but they *do* contribute significantly to a variety of pediatric and adolescent health problems: aggressive behavior, sexual activity, drug use, obesity, sleep disorders, and others. Epidemiologically, the media contribute perhaps 10% to 20% to any specific health problem.<sup>8,48,420</sup> Given the sheer amount of time that children and teens spend with media (>7 hours a day), one would think that adult society would recognize the impact of media on young people's attitudes and behaviors. Sadly,

many choose to ignore this potentially powerful influence. To date, too little has been done by parents, health care practitioners, schools, the entertainment industry, or the government to protect children and adolescents from harmful media effects and to maximize the powerfully prosocial aspects of modern media. More research is needed, but sufficient data exist to warrant both concern and increased action.

## REFERENCES

1. Bushman BJ, Huesmann LR. Effects of televised violence on aggression. In: Singer DG, Singer JL, editors. *Handbook of children and the media*. Thousand Oaks (CA): Sage; 2001. p. 223–54.
2. Deveny K, Kelley R. Girls gone wild: what are celebs teaching kids? *Newsweek* 2007;40–7.
3. Ansen D. A handful of tangos in Paris. *Newsweek* 1999;66.
4. Eszterhas J. Hollywood's responsibility for smoking deaths. Available at: [www.nytimes.com/2002/08/09/opinion/09ESZT.html](http://www.nytimes.com/2002/08/09/opinion/09ESZT.html). Accessed January 3, 2008.
5. Pipher M. Quoted in *People Magazine*. New York (NY): Time Warner Inc., June 3, 1996.
6. Boyer R, Levine D, Zensius N. *TECHsex USA—youth sexuality and reproductive health in the digital age*. Oakland (CA): ISIS, Inc.; 2011.
7. Boyd D. Why youth (heart) social network sites: the role of networked publics in teenage social life. In: Buckingham D, editor. *MacArthur Foundation Series on Digital Learning—youth, identity, and digital media*. Cambridge (MA): MIT Press; 2007. p. 119–42.
8. Strasburger VC, Wilson BJ, Jordan AB. *Children, adolescents, and the media*. 2nd edition. Thousand Oaks (CA): Sage; 2009.
9. Fisch S, Truglio R, Cole C. The impact of *Sesame Street* on preschool children: a review and synthesis of 30 years' of research. *Media Psychol* 1999;1:165–90.
10. Hogan MJ, Strasburger VC. Media and prosocial behavior in children and adolescents. In: Nucci L, Narvaez D, editors. *Handbook of moral and character education*. Mahwah (NJ): Lawrence Erlbaum; 2008. p. 537–53.
11. Mares M-L, Woodard EH. Effects of prosocial media content on children's social interactions. In: Singer DG, Singer JL, editors. *Handbook of children and media*. 2nd edition. Thousand Oaks (CA): Sage; 2012. p. 197–214.
12. Strasburger VC. Why do adolescent health researchers ignore the impact of the media? *J Adolesc Health* 2009;44:203–5.
13. Rideout V. *Generation M2: Media in the lives of 8- to 18-year-olds*. Menlo Park (CA): Kaiser Family Foundation; 2010.
14. Lenhart A. *Teens and sexting*. Washington, DC: Pew Internet & American Life Project; 2009. Available at: [http://www.pewinternet.org/~media/Files/Reports/2009/PIP\\_Teens\\_and\\_Sexting.pdf](http://www.pewinternet.org/~media/Files/Reports/2009/PIP_Teens_and_Sexting.pdf). Accessed June 27, 2011.
15. Jordan A, Bleakley A, Manganello J, et al. The role of television access in viewing time of US adolescents. *J Child Media* 2010;4(4):335–70.
16. Dennison BA, Erb TA, Jenkins PL. Television viewing and television in bedroom associated with overweight risk among low income preschool children. *Pediatrics* 2002;109(6):1028–35.
17. Jackson C, Brown JD, L'Engle KL. R-rated movies, bedroom televisions, and initiation of smoking by white and black adolescents. *Arch Pediatr Adolesc Med* 2007;161(3):260–8.
18. Garrison MM, Leikweg K, Christakis DA. Media use and child sleep: the impact of content, timing, and environment. *Pediatrics* 2011;128:29–35.

19. Rideout V, Roberts DF, Foehr UG. Generation M: Media in the lives of 8-18 year-olds. Menlo Park (CA): Kaiser Family Foundation; 2005.
20. Nielsen Company. Television, Internet and mobile usage in the U.S.: A2/M2 Three Screen Report. New York: Nielsen Company; 2009.
21. Rideout V, Lauricella A, Wartella E. Media use among white, black, Hispanic, and Asian American children. Evanston (IL): Northwestern University; 2011.
22. Rideout V. Zero to eight: children's media use in America. San Francisco: Common Sense Media; 2011. Available at: <http://www.commonsensemedia.org/sites/default/files/research/zerotoeightfinal2011.pdf>. Accessed December 3, 2011.
23. Nielsen Company. State of the media: TV usage trends: Q3 and Q4 2010. New York: Nielsen Company; 2011.
24. Lenhart A, Ling R, Campbell S, et al. Teens and mobile phones. Washington, DC: Pew Internet & American Life Project; 2010.
25. Vogel I, Vershuure H, van der Ploeg CP, et al. Adolescents and MP3 players: too many risks, too few precautions. *Pediatrics* 2009;123:e953-8.
26. Small G, Vorgan G. iBrain: surviving the technology alteration of the modern mind. New York: Harper Collins; 2008.
27. Lin L. Breadth-biased versus focused cognitive control in media multitasking behaviors. *Proc Natl Acad Sci U S A* 2009;106(37):15521-2.
28. Kohut A, Doherty C, Dimock M, et al. Internet gains on television as public's main news source. Washington, DC: Pew Research Center; 2011.
29. Hallin DC. Sound bite news: television coverage of elections, 1968-1988. *J Commun* 2006;42:5-24.
30. Robinson M. What sound bites are reported during the presidential campaign and why. 2007. Available at: [http://www.asocatedcontent.com/article/252458/what\\_sound\\_bites\\_are\\_reported\\_during](http://www.asocatedcontent.com/article/252458/what_sound_bites_are_reported_during). Accessed June 29, 2011.
31. Bandura A. Social cognitive theory of mass communication. In: Bryant J, Oliver MB, editors. *Media effects: advances in theory and research*. 3rd edition. New York: Routledge; 2009. p. 94-124.
32. Huesmann LR. The role of social information processing and cognitive schema in the acquisition and maintenance of habitual aggressive behavior. In: Geen RG, Donnerstein E, editors. *Human aggression: theories, research, and implications for policy*. New York: Academic Press; 1998. p. 73-109.
33. Strasburger VC. *Adolescents and the media: medical and psychological impact*. Thousand Oaks (CA): Sage; 1995.
34. Brown JD, Halpern CT, L'Engle KL. Mass media as a sexual super peer for early maturing girls. *J Adolesc Health* 2005;36:420-7.
35. Hoffner C, Plotkin R, Buchanan M, et al. The third-person effect in perceptions of the influence of television violence. *J Commun* 2006;51(2): 283-99.
36. Paul B, Salwen MB, Dupagne M. The third person effect: a meta-analysis of the perceptual hypothesis. In: Preiss R, Gayle B, Burrell N, et al, editors. *Mass media effects research: advances through meta-analysis*. Mahway (NJ): Lawrence Erlbaum; 2007. p. 81-102.
37. Strasburger VC, Council on Communications and Media. Media violence (policy statement). *Pediatrics* 2009;124:1495-503.
38. Smith A. Influence of TV crime programs on children's health. *JAMA* 1952;150:37.
39. Center on Media and Child Health. Available at: [www.cmch.tv](http://www.cmch.tv). Accessed July 25, 2011.
40. US Surgeon General's Scientific Advisory Committee on Television and Social Behavior. *Television and growing up: the impact of televised violence: report*

- to the surgeon general. Rockville (MD): National Institute of Mental Health, US Public Health Service; 1972. Publication No. HSM 72-9090.
41. Pearl D, Bouthilet L, Lazar J. Television and behavior. Ten years of scientific progress and implications for the eighties. Rockville (MD): National Institute of Mental Health; 1982.
  42. O'Toole ME. The school shooter: a threat assessment perspective. Quantico (VA): Federal Bureau of Investigation, US Department of Justice; 2000.
  43. In the matter of violent television programming and its impact on children. Statement of Commissioner Deborah Taylor Tate. Federal Communications Commission; 2007. MB docket No. 04-261.
  44. Gentile DA, Obert C, Sherwood NE, et al. Well-child exams in the video age: pediatricians and the American Academy of Pediatrics guidelines for children's media use. *Pediatrics* 2004;114(5):1235-41.
  45. Strasburger VC. Go ahead punk, make my day: it's time for pediatricians to take action against media violence. *Pediatrics* 2007;119(6):e1398-9.
  46. Murray JP. Media violence: the effects are both real and strong. *Am Behav Sci* 2008;51:1212-30.
  47. Bushman BJ, Huesmann LR. Effects of violent media on aggression. In: Singer DG, Singer JL, editors. *Handbook of children and the media*. Los Angeles (CA): Sage; 2012. p. 231-48.
  48. Comstock G, Strasburger VC. Media violence: Q&A. *Adolesc Med* 1993;4(3):495-510.
  49. Bushman BJ, Anderson CA. Comfortably numb: desensitizing effects of violent media on helping others. *Psychol Sci* 2009;20:273-7.
  50. Ybarra ML, Diener-West M, Markow D, et al. Linkages between Internet and other media violence with seriously violent behavior by youth. *Pediatrics* 2008;122:929-37.
  51. Cantor J. *Mommy, I'm scared: how TV and movies frighten children and what we can do to protect them*. New York: Harcourt Brace; 1998.
  52. Federman J, editor. *National television violence study, vol. 3*. Thousand Oaks (CA): Sage; 1998.
  53. Yokota F, Thompson KM. Violence in G-rated animated films. *JAMA* 2000;283(20):2716-20.
  54. Webb T, Jenkins L, Browne N, et al. Violent entertainment pitched to adolescents: an analysis of PG-13 films. *Pediatrics* 2007;119(6):e1219-29.
  55. Worth KA, Chambers JG, Naussau DH, et al. Exposure of US adolescents to extremely violent movies. *Pediatrics* 2008;122:306-12.
  56. Cheng TL, Brenner RA, Wright JL, et al. Children's violent television viewing: are parents monitoring? *Pediatrics* 2004;114(1):94-9.
  57. Leone R, Barowski L. MPAA ratings creep: a longitudinal analysis of the PG-13 rating category in US movies. *J Child Media* 2011;5(1):53-69.
  58. Herd DA. Changes in the prevalence of violent rap song lyrics 1979-1997. *J Public Health Policy* 2009;30(4):395-406.
  59. Ybarra ML, Diener-West M, Markow D, et al. Linkages between Internet and other media violence with seriously violent behavior by youth. *Pediatrics* 2008;122(5):929-37.
  60. Gentile DA. The rating systems for media products. In: Calvert S, Wilson B, editors. *Handbook on children and media*. Boston: Blackwell; 2007. p. 527-51.
  61. Funk JB, Buchman DD. Playing violent video and computer games and adolescent self-concept. *J Commun* 1996;46(2):19-32.

62. Walsh D, Gentile DA, Walsh E, et al. Tenth annual mediawise video game report card. Minneapolis (MN): National Institute on Media and the Family; 2006. Available at: <http://www.marketwire.com/press-release/10th-Annual-MediaWise-Video-Game-Report-Card-Console-Makers-Have-Evolved-Ratings-Have-671849.htm>. Accessed July 27, 2011.
63. Anderson CA, Gentile DA, Dill KE. Prosocial, antisocial, and other effects of recreational video games. In: Singer DG, Singer JL, editors. Handbook of children and the media. 2nd edition. Los Angeles (CA): Sage; 2012. p. 249–72.
64. Wolak J, Mitchell KJ, Finkelhor D. Does online harassment constitute bullying? An exploration of online harassment by known peers and online-only contacts. *J Adolesc Health* 2007;41:S51–8.
65. Ybarra ML, Diener-West M, Leaf PJ. Examining the overlap in Internet harassment and school bullying: implications for school intervention. *J Adolesc Health* 2007;41:S42–50.
66. Kowalski RM, Limber SP. Electronic bullying among middle school students. *J Adolesc Health* 2007;41:S22–30.
67. Hertz MF, David-Perdon C. Electronic media and youth violence: a CDC issue brief for educators and caregivers. Atlanta (GA): Centers for Disease Control; 2008.
68. Tokunaga RS. Following you home from school: a critical review and synthesis of research on cyberbullying victimization. *Comput Human Behav* 2010;26:277–87.
69. Ybarra ML, Mitchell KJ, Korchmaros JD. National trends in exposure to and experiences of violence on the Internet among children. *Pediatrics* 2011;128:e1376–86.
70. Williams KR, Guerra NG. Prevalence and predictors of Internet bullying. *J Adolesc Health* 2007;S14–21.
71. Ybarra ML, Espelage DL, Mitchell KJ. The co-occurrence of Internet harassment and unwanted sexual solicitation victimization and perpetration: associations with psychosocial indicators. *J Adolesc Health* 2007;S31–41.
72. McIntosh WD, Murray JD, Murray RM, et al. What's so funny about a poke in the eye? The prevalence of violence in comedy films and its relation to social and economic threat in the United States, 1951–2000. *Mass Comm Soc* 2003;6:345–60.
73. Kirsh SJ. Children, adolescents, and media violence: a critical look at the research. 2nd edition. Thousand Oaks (CA): Sage; 2012.
74. Anderson CA, Berkowitz L, Donnerstein E, et al. The influence of media violence on youth. *Psychol Sci Public Interest* 2003;4(3):81–110.
75. Boxer P, Huesmann LR, Bushman BJ, et al. The role of violent media preference in cumulative developmental risk for violence and general aggression. *J Youth Adolesc* 2009;38:417–28.
76. Donnerstein E. The Internet. In: Strasburger VC, Wilson BJ, Jordan AB. Children, adolescents, and the media. 3rd edition. Thousand Oaks (CA): Sage; 2013, in press.
77. Strasburger VC, Grossman D. How many more Columbines? What can pediatricians do about school and media violence? *Pediatr Ann* 2001;30:87–94.
78. Bleakley A, Hennessy M, Fishbein M, et al. How sources of sexual information relate to adolescents' beliefs about sex. *Am J Health Behav* 2009;33(1):37–48.
79. Strasburger VC. Adolescents, sex, and the media. *Pediatr Clin North Am* 2012;23(1):15–33.
80. Strasburger VC, Council on Communications and Media. Sexuality, contraception, and the media (policy statement). *Pediatrics* 2010;126:576–82.

81. Brown JD, Strasburger VC. From Calvin Klein to Paris Hilton and MySpace: adolescents, sex, and the media. *Adolesc Med State Art Rev* 2007;18:484–507.
82. Wright PJ. Mass media effects on youth sexual behavior: assessing the claim for causality. *Comm Yearbk* 2011;35:343–86.
83. National Campaign to Prevent Teen and Unplanned Pregnancy. Teen child-bearing in the United States, final 2008 birth data. Washington, DC: NCPTUP; 2010.
84. Centers for Disease Control and Prevention. Vital signs: teen pregnancy—United States, 1991-2009. *MMWR Morb Mortal Wkly Rep* 2011;60(13):414–20.
85. Centers for Disease Control and Prevention. Youth risk behavior surveillance—United States, 2009. *MMWR Morb Mortal Wkly Rep* 2010;59(No. SS-5):1–142.
86. Kunkel D, Eyal K, Finnerty K, et al. Sex on TV 4: a biennial report to the Kaiser Family Foundation. Menlo Park (CA): Kaiser Family Foundation; 2005.
87. Ybarra M. Digital adolescence: myths and truths about growing up with technology. Presented at annual meeting of American Psychological Association. Washington, DC: August 6, 2011.
88. Kunkel D, Eyal K, Donnerstein E, et al. Sexual socialization messages on entertainment television: comparing content trends 1997-2002. *Media Psychol* 2007;9:595–622.
89. Zurbriggen EL, Morgan EM. Who wants to marry a millionaire? Reality dating television programs, attitudes towards sex, and sexual behaviors. *Sex Roles* 2006;54:1–17.
90. Tomashoff C. Are the kids all right? *TV Guide* 2011;12–4.
91. Parents Television Council. Sexualized teen girls: tinseltown's new target. Washington, DC: Parents Television Council; 2010.
92. Williams ME. Television's season of the vagina. 2011. Available at: [http://www.salon.com/2011/09/26/vagina\\_sitcom\\_season/](http://www.salon.com/2011/09/26/vagina_sitcom_season/). Accessed December 2, 2011.
93. Carter B. This year's hot TV trend is anatomically correct. *NY Times* 2011. Available at: <http://www.nytimes.com/2011/09/22/arts/television/this-years-hot-tv-trend-is-a-word.html?pagewanted=all>. Accessed December 2, 2011.
94. Tuck L. Viewer discretion advised. *POZ.com*. Available at: [http://www.poz.com/articles/Teens\\_HIV\\_TV\\_2557\\_19656.shtml](http://www.poz.com/articles/Teens_HIV_TV_2557_19656.shtml). Accessed August 22, 2011.
95. Bashir M. Porn in hi-definition: too much detail? *ABC News.com*; 2007. Available at: <http://abcnews.go.com/Nightline/story?id=2854981&page=1>. Accessed July 28, 2011.
96. Wingood GM, DiClemente RJ, Harrington K, et al. Exposure to X-rated movies and adolescents' sexual and contraceptive-related attitudes and behaviors. *Pediatrics* 2001;107:1116–9.
97. Wright PJ, Malamuth NM, Donnerstein E. Research on sex in the media: what do we know about effects on children and adolescents? In: Singer DG, Singer JL, editors. *Handbook of children and the media*. 2nd edition. Los Angeles (CA): Sage; 2012. p. 273–302.
98. Bridges AJ, Wosnitzer R, Scharrer E, et al. Aggression and sexual behavior in best-selling pornography videos: a content analysis update. *Violence Against Women* 2010;16(10):1065–85.
99. Primack BA, Gold MA, Schwarz EB, et al. Degrading and non-degrading sex in popular music: a content analysis. *Public Health Rep* 2008;123:593–600.
100. Hall PC, West JH, Hill S. Sexualization in lyrics of popular music from 1959 to 2009: implications for sexuality educators. *Sexuality and Culture* 2011. DOI: 10.1007/s12119-011-9103-4.

101. Walsh-Childers K, Gotthoffer A, Lepre CR. From “just the facts” to “downright salacious”: teens’ and women’s magazines’ coverage of sex and sexual health. In: Brown JD, Steele JR, Walsh-Childers K, editors. *Sexual teens, sexual media*. Hillsdale (NJ): Lawrence Erlbaum; 2002. p. 153–71.
102. Reichert T, Carpenter C. An update on sex in magazine advertising: 1983 to 2003. *Journal Mass Commun Q* 2004;81:823–37.
103. Wingood GM, DiClemente RJ, Bernhardt JM, et al. A prospective study of exposure to rap music videos and African American female adolescents’ health. *Am J Public Health* 2003;93:437–9.
104. Collins RL, Elliott MN, Berry SH, et al. Watching sex on television predicts adolescent initiation of sexual behavior. *Pediatrics* 2004;114:e280–9.
105. Ashby SL, Arcari CM, Edmonson MB. Television viewing and risk of sexual initiation by young adolescents. *Arch Pediatr Adolesc Med* 2006;160:375–80.
106. Brown JD, L’Engle K, Pardun CJ, et al. Sexy media matter: exposure to sexual content in music, movies, television, and magazines predicts black and white adolescents’ sexual behavior. *Pediatrics* 2006;117:1018–27.
107. Martino SC, Collins RL, Elliott MN, et al. Exposure to degrading versus nondegrading music lyrics and sexual behavior among youth. *Pediatrics* 2006;118:e430–41.
108. Chandra A, Martino SC, Collins RL, et al. Does watching sex on television predict teen pregnancy? Findings from a National Longitudinal Survey of Youth. *Pediatrics* 2008;122:1047–54.
109. Bersamin M, Todd M, Fisher DA, et al. Parenting practices and adolescent sexual behavior: a longitudinal study. *J Marriage Fam* 2008;70:97–112.
110. Bleakley A, Hennessy M, Fishbein M, et al. It works both ways: The relationship between exposure to sexual content in the media and adolescent sexual behavior. *Media Psychol* 2008;11:443–61.
111. Peter J, Valkenburg PM. Adolescents’ exposure to sexually explicit Internet material and sexual preoccupation: a three-wave panel study. *Media Psychol* 2008;11:207–34.
112. Brown JD, L’Engle KL. X-rated: sexual attitudes and behaviors associated with U.S. early adolescents’ exposure to sexually explicit media. *Communic Res* 2009;36:129–51.
113. Delgado H, Austin SB, Rich M, et al. Exposure to adult-targeted television and movies during childhood increases risk of initiation of early intercourse [abstract]. Presented at Pediatric Academic Societies meeting. Baltimore, May 4, 2009.
114. Hennessy M, Bleakley A, Fishbein M, et al. Estimating the longitudinal association between adolescent sexual behavior and exposure to sexual media content. *J Sex Res* 2009;46:1–11.
115. Bersamin MM, Bourdeau B, Fisher DA, et al. Television use, sexual behavior, and relationship status at last oral sex and vaginal intercourse. *Sexuality and Culture* 2010;14:157–68.
116. Ybarra ML, Mitchell KJ, Hamburger M, et al. X-rated material and perpetration of sexually aggressive behavior among children and adolescents: is there a link? *Aggress Behav* 2011;37:1–18.
117. Martino SC, Collins RL, Kanouse DE, et al. Social cognitive processes mediating the relationship between exposure to television’s sexual content and adolescents’ sexual behavior. *J Pers Soc Psychol* 2005;89:914–24.
118. L’Engle KL, Jackson C. Socialization influences on early adolescents’ cognitive susceptibility and transition to sexual intercourse. *J Res Adolesc* 2008;18:353–78.

119. Gottfried JA, Vaala SE, Bleakley A, et al. Does the effect of exposure to TV sex on adolescent sexual behavior vary by genre? *Communic Res* 2011. Available at: <http://crx.sagepub.com/content/early/2011/07/16/0093650211415399.full.pdf+html>. Accessed March 16, 2012.
120. Primack BA, Douglas EL, Fine MJ, et al. Exposure to sexual lyrics and sexual experience among urban adolescents. *Am J Prev Med* 2009;36:317–23.
121. Newman AA. Pigs with cellphones, but no condoms. *New York Times* 2007;B1. Available at: <http://www.nytimes.com/2007/06/18/business/media/18adcol.html?adxnnl=1&adxnnlx=1313772936-1WXEee4fVg80ZPLh1fojeA>. Accessed August 19, 2011.
122. Brodesser-akner C. Sex on TV is ok as long as it's not safe. *Advert Age* 2007. Available at: <http://adage.com/article/news/sex-tv-long-safe/120489/>. Accessed December 3, 2011.
123. Snowbeck C. FDA tells Levitra to cool it with ad. *Post-Gazette* 2005. Available at: [www.post-gazette.com/pg/05109/490334-28.stm](http://www.post-gazette.com/pg/05109/490334-28.stm). Accessed August 22, 2011.
124. Campbell S. Promotional spending for prescription drugs. Washington, DC: Congressional Budget Office; 2009. Available at: [http://www.cbo.gov/ftpdocs/105xx/doc10522/12-02-DrugPromo\\_Brief.pdf](http://www.cbo.gov/ftpdocs/105xx/doc10522/12-02-DrugPromo_Brief.pdf). Accessed August 22, 2011.
125. Wolk LI, Rosenbaum R. The benefits of school-based condom availability: cross-sectional analysis of a comprehensive high school-based program. *J Adolesc Health* 1995;17:184–8.
126. Furstenberg FF Jr, Geitz LM, Teitler JO, et al. Does condom availability make a difference? An evaluation of Philadelphia's health resource centers. *Fam Plann Perspect* 1997;29:123–7.
127. Guttmacher S, Lieberman L, Ward D, et al. Condom availability in New York City public high schools: relationships to condom use and sexual behavior. *Am J Public Health* 1997;87:1427–33.
128. Jemmott JB III, Jemmott LS, Fong GT. Abstinence and safer sex: HIV risk-reduction interventions for African American adolescents. *JAMA* 1998;279:1529–36.
129. Schuster MA, Bell RM, Berry SH, et al. Impact of a high-school condom availability program on sexual attitudes and behaviors. *Fam Plann Perspect* 1998;30:67–72.
130. Kirby D, Brener ND, Brown NL, et al. The impact of condom distribution in Seattle schools on sexual behavior and condom use. *Am J Public Health* 1999;89:182–7.
131. Blake SM, Ledsky R, Goodenow C, et al. Condom availability programs in Massachusetts high schools: relationships with condom use and sexual behavior. *Am J Public Health* 2003;93:955–62.
132. Sellers DE, McGraw SA, McKinlay JB. Does the promotion and distribution of condoms increase sexual activity? Evidence from an HIV prevention program for Latino youth. *Am J Public Health* 1994;84:1952–9.
133. Wretzel SR, Visintainer PF, Koenigs LMP. Condom availability program in an inner city public school: effect on the rates of gonorrhoea and chlamydia infection. *J Adolesc Health* 2011;49(3):324–6.
134. Kristof N. Beyond chastity belts. *New York Times* 2006;A25. Available at: [http://select.nytimes.com/2006/05/02/opinion/02kristof.html?\\_r=2](http://select.nytimes.com/2006/05/02/opinion/02kristof.html?_r=2). Accessed August 22, 2011. 131.
135. Rideout V. *Generation RX.Com: how young people use the Internet for health information*. Menlo Park (CA): Kaiser Family Foundation; 2001.
136. Wolak J, Mitchell K, Finkelhor D. Unwanted and wanted exposure to online pornography in a national sample of youth Internet users. *Pediatrics* 2007;119:247–57.

137. Sabina C, Wolak J, Finkelhor D. The nature and dynamics of Internet pornography exposure for youth. *Cyberpsychol Behav* 2008;11:1–3.
138. Moyer MW. The sunny side of smut. *Sci Am* 2011;14–5.
139. Braun-Courville DK, Rojas M. Exposure to sexually explicit web sites and adolescent sexual attitudes and behaviors. *J Adolesc Health* 2009;45:156–62.
140. Lounsbury K, Mitchell KJ, Finkelhor D. The true prevalence of “sexting.” Durham (NH): Crimes Against Children Research Center, University of New Hampshire; 2011.
141. National Campaign to Prevent Teen and Unplanned Pregnancy. Sex and tech. Washington, DC: National Campaign to Prevent Teen and Unplanned Pregnancy; 2008.
142. Cox Communications. Teen Online & Wireless Safety Survey: cyberbullying, sexting, and parental controls. Atlanta (GA): Cox Communications; 2009.
143. Associated Press and MTV. AP-MTV Digital Abuse Study, executive summary. Available at: [http://www.athinline.org/MTV-AP\\_Digital\\_Abuse\\_Study\\_Executive\\_Summary.pdf](http://www.athinline.org/MTV-AP_Digital_Abuse_Study_Executive_Summary.pdf). Accessed August 17, 2011.
144. Phippen A. Sharing personal images and videos among young people. South West Grid for Learning & University of Plymouth, UK. Available at: <http://www.swgfl.org.uk/Staying-Safe/Files/Documents/sexting-summary>. Accessed August 17, 2011.
145. Mitchell K, Finkelhor D, Jones L, et al. Prevalence and characteristics of youth sexting: a national study. *Pediatrics* 2012;129:1–8.
146. Calvert C. Sex, cell phones, privacy, and the first amendment: when children become child pornographers and the Lolita Effect undermines the law. *Comm-Law Conspectus* 2009;18:1–65.
147. Klepper D. Teen sexting penalties may be relaxed by states. *The Huffington Post* 2011. Available at: [http://www.huffingtonpost.com/2011/06/13/teen-sexting-penalties\\_n\\_875783.html?view=print](http://www.huffingtonpost.com/2011/06/13/teen-sexting-penalties_n_875783.html?view=print). Accessed August 17, 2011.
148. Wolak J, Finkelhor D, Mitchell KJ. How often are teens arrested for sexting? Data from a national sample of police cases. *Pediatrics* 2012;129:1–9.
149. Lithwick D. Textual misconduct. *Slate*, 2009. Available at: <http://www.slate.com/id/2211169/>. Accessed August 22, 2011.
150. Wilson C. Feds: online “sextortion” of teens on the rise. Associated Press; 2010. Available at: [http://www.msnbc.msn.com/id/38714259/ns/technology\\_and-science-security/t/feds-online-sextortion-teens-rise/](http://www.msnbc.msn.com/id/38714259/ns/technology_and-science-security/t/feds-online-sextortion-teens-rise/). Accessed August 22, 2011.
151. Moreno MA, Parks MR, Zimmerman FJ, et al. Display of health risk behavior on MySpace by adolescents. *Arch Pediatr Adolesc Med* 2009;163:27–34.
152. Moreno MA, Brockman L, Rogers CB, et al. An evaluation of the distribution of sexual references among “top 8” MySpace friends. *J Adolesc Health* 2010;47(4):418–20.
153. Joshi M. Social sites may provide clues to teens’ sexual intentions. *Health News* 2010. Available at: <http://www.topnews.in/health/social-sites-may-provide-clues-teens-sexual-intentions-27065>. Accessed April 4, 2012.
154. Mitchell KJ, Wolak J, Finkelhor D. Trends in youth reports of sexual solicitations, harassment, and unwanted exposure to pornography on the Internet. *J Adolesc Health* 2007;40:116–26.
155. Ybarra ML, Mitchell KH. How risky are social networking sites? A comparison of places online where youth sexual solicitation and harassment occurs. *Pediatrics* 2008;121(2):e350–7.
156. Mitchell KJ, Finkelhor D, Jones LM, et al. Use of social networking sites in online sex crimes against minors: an examination of national incidence and means of utilization. *J Adolesc Health* 2010;47:183–90.

157. Noll JG, Shenk CE, Barnes JE, et al. Childhood abuse, avatar choices, and other risk factors associated with Internet-initiated victimization of adolescent girls. *Pediatrics* 2009;123:e1078–83.
158. Wolak J, Finkelhor D, Mitchell KH, et al. Online “predators” and their victims: myths, realities, and implications for prevention and treatment. *Am Psychol* 2008;63:111–28.
159. Brodie M, Foehr U, Rideout V, et al. Communicating health information through the entertainment media. *Health Aff (Millwood)* 2001;20(1):192–9.
160. Collins RL, Elliott MN, Berry SH, et al. Entertainment television as a healthy sex educator: the impact of condom-efficacy information in an episode of *Friends*. *Pediatrics* 2003;112(5):1115–21.
161. Rideout V. Television as a health educator: a case study of *Grey’s Anatomy*. Menlo Park (CA): Kaiser Family Foundation; 2008.
162. Armstrong J. Gay teens on TV. *TV Guide* 2011;34–41.
163. Hoffman J. Fighting teenage pregnancy with MTV stars as Exhibit A. *New York Times* 2011;1–11.
164. National Campaign to Prevent Teen and Unplanned Pregnancy. Is media glamorizing teen pregnancy [press release]. Washington, DC: NCPTUP; 2010.
165. Pinkleton BE, Austin EW, Cohen M, et al. Effects of a peer-led media literacy curriculum on adolescents’ knowledge and attitudes toward sexual behavior and media portrayals of sex. *Health Commun* 2008;23(5):462–72.
166. DuRant RH, Wolfson M, LaFrance B, et al. An evaluation of a mass media campaign to encourage parents of adolescents to talk to their children about sex. *J Adolesc Health* 2006;38(3):298,e1–9.
167. Collins RL, Martino SC, Shaw R. Influence of new media on adolescent sexual health: evidence and opportunities. Santa Monica (CA): RAND; 2011.
168. Levine D, McCright J, Dobkin L, et al. SEXINFO: a sexual health text messaging service for San Francisco youth. *Am J Public Health* 2008;98:393–5.
169. Winston L. Good, better, best: school-based STD screening in Washington, DC. Washington, DC: U.S. Department of Health; 2010.
170. Paperny DM, Starn JR. Adolescent pregnancy prevention by health education computer games: computer-assisted instruction of knowledge and attitudes. *Pediatrics* 1989;83:742–52.
171. Tortolero SR, Markham CM, Peskin MF, et al. It’s your game: keep it real: delaying sexual behavior with an effective middle school program. *J Adolesc Health* 2009;46:169–79.
172. Freimuth VS, Snyder L, Nadorff GG, et al. Assessing the viral transmission of HIV mobile media messages. Paper presented at CDC Annual Conference on Health Communication, Marketing, and Media. Atlanta, August 12, 2009.
173. Moreno MA, VanderStoep A, Parks MR, et al. Reducing at-risk adolescents’ display of risk behavior on a social networking web site. *Arch Pediatr Adolesc Med* 2009;163:35–41.
174. Strasburger VC, Council on Communications and Media. Children, adolescents, substance abuse, and the media. *Pediatrics* 2010;126:791–9.
175. Strasburger VC. Children, adolescents, drugs, and the media. In: Singer DG, Singer JL, editors. *Handbook children and the media*. 2nd edition. Los Angeles (CA): Sage; 2012. p. 419–54.
176. American Academy of Pediatrics. Committee on Substance Abuse. Tobacco use: a pediatric disease. *Pediatrics* 2009;124(5):1474–87.

177. Johnston LD, O'Malley PM, Bachman JG, et al. Monitoring the future national results on adolescent drug use: overview of key findings, 2010. Ann Arbor (MI): Institute for Social Research, University of Michigan; 2011.
178. US Department of Health and Human Services. The Surgeon General's call to action to prevent and reduce underage drinking. Rockville (MD): US Department of Health and Human Services; 2007.
179. Federal Trade Commission. Federal Trade Commission cigarette report for 2007 and 2008. Washington, DC: FTC; 2011. Available at: <http://www.ftc.gov/os/2011/07/110729cigarettereport.pdf>. Accessed August 27, 2011.
180. Fritschler AL, Hoefler JM. Smoking & politics: policy making and the federal bureaucracy. 6th edition. Upper Saddle River (NJ): Prentice Hall; 2006.
181. US Department of Health and Human Services. Preventing tobacco use among young people: report of the Surgeon General. Washington, DC: US Government Printing Office; 1994.
182. Pierce JP, Messer K, James LE, et al. Camel No. 9 cigarette-marketing campaign targeted young girls. *Pediatrics* 2010;125:619–26.
183. Wellman RJ, Sugarman DB, DiFranza J, et al. The extent to which tobacco marketing and tobacco use in films contribute to children's use of tobacco. *Arch Pediatr Adolesc Med* 2006;160(12):1285–96.
184. Centers for Disease Control. Cigarette brand preference among middle and high school students who are established smokers—United States, 2004 and 2006. *MMWR Morb Mortal Wkly Rep* 2009;58:112–5.
185. Cortese DK, Lewis MJ, Ling PM. Tobacco industry lifestyle magazines targeted to young adults. *J Adolesc Health Care* 2009;45:268–80.
186. DiFranza JR, Wellman RJ, Sargent JD, et al. Tobacco Consortium, Center for Child Health Research of the American Academy of Pediatrics. Tobacco promotion and the initiation of tobacco use: assessing the evidence for causality. *Pediatrics* 2006;117(6):e1237–48.
187. Sargent J, Gibson J, Heatherton T. Comparing the effects of entertainment media and tobacco marketing on youth smoking. *Tob Control* 2009;18(1):47–53.
188. Hanewinkel R, Isensee B, Sargent JD, et al. Cigarette advertising and teen smoking initiation. *Pediatrics* 2011;127:e271–8.
189. US Food and Drug Administration. Overview: Cigarette health warnings. Available at: [http://www.fda.gov/TobaccoProducts/Labeling/ucm259214.htm#High\\_Resolution\\_Image\\_Formats](http://www.fda.gov/TobaccoProducts/Labeling/ucm259214.htm#High_Resolution_Image_Formats). Accessed March 16, 2012.
190. Center on Alcohol Marketing and Youth. Alcohol advertising and youth [fact sheet]. Washington, DC: Center on Alcohol Marketing and Youth; 2007.
191. Grube JW, Waiters E. Alcohol in the media: content and effects on drinking beliefs and behaviors among youth. *Adolesc Med Clin* 2005;16(2):327–43.
192. Jernigan DH. Importance of reducing youth exposure to alcohol advertising. *Arch Pediatr Adolesc Med* 2006;160(1):100–2.
193. Center on Alcohol Marketing and Youth. Youth exposure to alcohol advertising on television, 2001–2009. Baltimore (MD): CAMY; 2010.
194. Tanski SE, McClure AC, Jernigan DH, et al. Alcohol brand preference and binge drinking among adolescents. *Arch Pediatr Adolesc Med* 2011;165:675–6.
195. Center on Alcohol Marketing and Youth. Youth exposure to alcohol advertising in national magazines, 2001–2008. Baltimore (MD): CAMY; 2010.
196. Henriksen L, Feighery EC, Schleicher NC, et al. Receptivity to alcohol marketing predicts initiation of alcohol use. *J Adolesc Health* 2009;42:28–35.

197. Anderson P, de Bruijn A, Angus K, et al. Impact of alcohol advertising and media exposure on adolescent alcohol use: a systematic review of longitudinal studies. *Alcohol Alcohol* 2009;44:229–43.
198. McClure AC, Stoolmiller M, Tanski SE, et al. Alcohol-branded merchandise and its association with drinking attitudes and outcomes in US adolescents. *Arch Pediatr Adolesc Med* 2009;163:211–7.
199. Smith LA, Foxcroft DR. The effect of alcohol advertising, marketing and portrayal on drinking behavior in young people: systematic review of prospective cohort studies. *BMC Public Health* 2009;9:51. Available at: <http://www.biomedcentral.com/1471-2458/9/51>. Accessed March 16, 2012.
200. Jernigan DH. Alcohol-branded merchandise. *Arch Pediatr Adolesc Med* 2009;163(3):278–9.
201. Morgenstern M, Isensee B, Sargent JD, et al. Attitudes as mediators of the longitudinal association between alcohol advertising and youth drinking. *Arch Pediatr Adolesc Med* 2011;165:610–6.
202. Stange KC. Time to ban direct-to-consumer prescription drug marketing. *Ann Fam Med* 2007;5:101–4.
203. Rubin A. Prescription drugs and the cost of advertising them. 2007. Available at: [www.therubins.com/geninfo/advertise2.htm](http://www.therubins.com/geninfo/advertise2.htm). Accessed August 28, 2011.
204. Angell M. The truth about the drug companies: how they deceive us and what to do about it. New York: Random House; 2005.
205. American Legacy Foundation. Trends in top box-office movie tobacco use: 1996 –2004. Washington, DC: American Legacy Foundation; 2006.
206. Sargent JD, Tanski SE, Gibson J. Exposure to movie smoking among US adolescents aged 10 to 14 years: a population estimate. *Pediatrics* 2007;119(5):e1167–76.
207. Goldstein AO, Sobel RA, Newman GR. Tobacco and alcohol use in G-rated children's animated films. *JAMA* 1999;281(12):1131–6.
208. Sargent JD, Heatherton TF. Comparison of trends for adolescent smoking and smoking in movies, 1990–2007. *JAMA* 2009;301(21):2211–3.
209. Glantz SA, Titus K, Mitchell S, et al. Smoking in top-grossing movies—United States, 1991–2009. *MMWR Morb Mortal Wkly Rep* 2010;59(32):1014–7.
210. Dalton MA, Sargent JD, Beach ML, et al. Effect of viewing smoking in movies on adolescent smoking initiation: a cohort study. *Lancet* 2003;362(9380):281–5.
211. Sargent JD, Beach ML, Adachi-Mejia AM, et al. Exposure to movie smoking: its relation to smoking initiation among US adolescents. *Pediatrics* 2005;116:1183–91.
212. National Cancer Institute. The role of the media in promoting and reducing tobacco use. Tobacco Control Monograph No. 19. Bethesda (MD): U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute; 2008. NIH Pub. No. 07–6242.
213. Titus-Ernstoff L, Dalton MA, Adachi-Mejia AM, et al. Longitudinal study of viewing smoking in movies and initiation of smoking by children. *Pediatrics* 2008;121(1):15–21.
214. Dalton M, Beach M, Adachi-Mejia AM, et al. Early exposure to movie smoking predicts established smoking by older teens and young adults. *Pediatrics* 2009;123:e551–8.
215. Heatherton TF, Sargent JD. Does watching smoking in movies promote teenage smoking? *Curr Dir Psychol Sci* 2009;18:63–7.
216. Tanski SE, Stoolmiller M, Dal Cin S, et al. Movie characters smoking and adolescent smoking: who matters more, good guys or bad guys? *Pediatrics* 2009;124:135–43.

217. Morgenstern M, Poelen EAP, Sholte R, et al. Smoking in movies and adolescent smoking: cross-cultural study in six European countries. *Thorax* 2011. Published online August 25, 2011. Available at: <http://thorax.bmj.com/content/early/2011/08/25/thoraxjnl-2011-200489.short>? Accessed August 30, 2011.
218. Dalton MA, Adachi-Meija AM, Longacre MR, et al. Parental rules and monitoring of children's movie viewing associated with children's risk for smoking and drinking. *Pediatrics* 2006;118(5):1932–42.
219. Jago R, Davison KK, Thompson J, et al. Parental sedentary restriction, maternal parenting style, and television viewing among 10- to 11-year-olds. *Pediatrics* 2011;128(3):e572–8.
220. Cullen J, Sokol NA, Slawek D, et al. Depictions of tobacco use in 2007 broadcast television programming popular among US youth. *Arch Pediatr Adolesc Med* 2011;165:147–51.
221. Healton CG, Watson-Stryker ES, Allen JA, et al. Televised movie trailers: undermining restrictions on advertising tobacco to youth. *Arch Pediatr Adolesc Med* 2006;160:885–8.
222. Hanewinkel R. Cigarette smoking and perception of a movie character in a film trailer. *Arch Pediatr Adolesc Med* 2009;163:15–8.
223. Murphy ST. How healthy is prime time? An analysis of health content in popular prime time television programs. Menlo Park (CA): Kaiser Family Foundation; 2008.
224. Gruber EL, Thau HM, Hill DL, et al. Alcohol, tobacco and illicit substances in music videos: a content analysis of prevalence and genre. *J Adolesc Health* 2005;37(1):81–3.
225. National Center on Addiction and Substance Abuse. National survey of American attitudes on substance abuse XVI: teens and parents. New York: Columbia University; 2011. Available at: <http://www.casacolumbia.org/upload/2011/20110824teensurveyreport.pdf>. Accessed August 28, 2011.
226. Sargent JD, Wills TA, Stoolmiller M, et al. Alcohol use in motion pictures and its relation to early-onset teen drinking. *J Stud Alcohol* 2006;67:54–65.
227. Primack BA, Kraemer KL, Fine MJ, et al. Media exposure and marijuana and alcohol use among adolescents. *Subst Use Misuse* 2009;44(5):722–39.
228. Wills TA, Sargent JD, Gibbons FX, et al. Movie exposure to alcohol cues and adolescent alcohol problems: a longitudinal analysis in a national sample. *Psychol Addict Behav* 2009;23(1):23–5.
229. Hanewinkel R, Sargent JD. Longitudinal study of exposure to entertainment media and alcohol use among German adolescents. *Pediatrics* 2009;123:989–95.
230. National Center on Addiction and Substance Abuse. National survey of American attitudes on substance abuse IX: teens and parents. New York: National Center on Addiction and Substance Abuse; 2005.
231. Dalton MA, Bernhardt AM, Gibson JJ, et al. Use of cigarettes and alcohol by preschoolers while role-playing as adults. *Arch Pediatr Adolesc Med* 2005;159(9):854–9.
232. Engels RC, Hermans R, van Baaren RB, et al. Alcohol portrayal on television affects actual drinking behaviour. *Alcohol Alcohol* 2009;44(3):244–9.
233. Callister M, Coyne SM, Robinson T, et al. "Three sheets to the wind": substance use in teen-centered film from 1980 to 2007. *Addiction Res Theor* 2011. DOI: 10.3109/16066359.2011.552818. Published online on May 23, 2011.
234. Christenson PG, Henriksen L, Roberts DF. Substance use in popular prime-time television. Washington, DC: Office of National Drug Policy Control; 2000.
235. Halperin S. Going to pot. *Entertainment Weekly* 2008;38–41.

236. Primack BA, Douglas EL, Kraemer KL. Exposure to cannabis in popular music and cannabis use among adolescents. *Addiction* 2010;105(3):515–23.
237. Jenssen BP, Klein JD, Salazar LR, et al. Exposure to tobacco on the Internet: content analysis of adolescents' Internet use. *Pediatrics* 2009;124:e180–6.
238. Moreno MA, Briner LR, Williams A, et al. A content analysis of displayed alcohol references on a social networking web site. *J Adolesc Health* 2010; 47:168–72.
239. Moreno MA, Briner LR, Williams A, et al. Real use or “real cool”: adolescents speak out about displayed alcohol references on social networking websites. *J Adolesc Health* 2009;45:420–2.
240. Hitti M. Teens buying alcohol online. *WebMD Medical News* 2006. Available at: <http://www.webmd.com/parenting/news/20060811/teens-buy-alcohol-online>. Accessed August 28, 2011.
241. C.S. Mott Children's Hospital. National poll on children's health. Vol. 13, No. 3. August 15, 2011. Available at: <http://www.med.umich.edu/mott/npch/pdf/081511toptenreport.pdf>. Accessed September 1, 2011.
242. Special Feature. Obesity rates spin out of control. *Nutrition Action HealthLetter* 2011;11.
243. Ogden C, Carroll M. Prevalence of obesity among children and adolescents: United States, trends 1963-1965 through 2007-2008. Available at: [http://www.cdc.gov/nchs/data/hestat/obesity\\_child\\_07\\_08/obesity\\_child\\_07\\_08.pdf](http://www.cdc.gov/nchs/data/hestat/obesity_child_07_08/obesity_child_07_08.pdf). Accessed August 29, 2011.
244. Balkau B, Deanfield JE, Despres J-P, et al. International day for the evaluation of abdominal obesity (IDEA). A study of waist circumference, cardiovascular disease, and diabetes mellitus in 168,000 primary care patients in 63 countries. *Circulation* 2007;116:1942–51.
245. Danaei G, Finucane MM, Lu Y, et al. National, regional, and global trends in fasting plasma glucose and diabetes prevalence since 1980: systematic analysis of health examination surveys and epidemiological studies with 370 country-years and 2.7 million participants. *Lancet* 2011;378:31–40.
246. Today USA. Obesity costs U.S. \$168 billion, study finds. 2010. Available at: [http://www.usatoday.com/yourlife/fitness/2010-10-18-obesity-costs\\_N.htm](http://www.usatoday.com/yourlife/fitness/2010-10-18-obesity-costs_N.htm). Accessed August 29, 2011.
247. Jordan A. Children's television viewing and childhood obesity. *Pediatr Ann* 2010; 39(9):569–73.
248. Dennison BA, Edmunds LS. The role of television in childhood obesity. *Progr Pediatr Cardiol* 2008;25(2):191–7.
249. Hancox RJ, Milne BJ, Poulton R. Association between child and adolescent television viewing and adult health: a longitudinal birth cohort study. *Lancet* 2004; 364(9430):257–62.
250. Viner RM, Cole TJ. Television viewing in early childhood predicts adult body mass index. *J Pediatr* 2005;147(4):429–35.
251. Reilly JJ, Armstrong J, Dorosty AR, et al. Early life risk factors for obesity in childhood: cohort study. *BMJ* 2005;330(7504):1357.
252. Sugimori H, Yoshida K, Izuno T, et al. Analysis of factors that influence body mass index from ages 3 to 6 years: a study based on the Toyama cohort study. *Pediatr Int* 2004;46(3):302–10.
253. Proctor MH, Moore LL, Gao D, et al. Television viewing and change in body fat from preschool to early adolescence: the Framingham Children's Study. *Int J Obes Relat Metab Disord* 2003;27:827–33.

254. Henderson VR. Longitudinal associations between television viewing and body mass index among white and black girls. *J Adolesc Health* 2007;41:544–50.
255. Mendoza JA, Zimmerman FJ, Christakis DA. Television viewing, computer use, obesity, and adiposity in US preschool children. *Int J Behav Nutr Phys Act* 2007;4:44. Available at: <http://www.ijbnpa.org/content/4/1/44>. Accessed August 31, 2011.
256. Sisson SB, Broyles ST, Baker BL, et al. Screen time, physical activity, and overweight in U.S. youth: National Survey of Children's Health 2003. *J Adolesc Health* 2010;47:309–11.
257. Zimmerman FJ, Bell JF. Associations of television content type and obesity in children. *Am J Public Health* 2010;100:334–40.
258. Anderson SE, Whitaker RC. Household routines and obesity in US preschool-age children. *Pediatrics* 2010;125:420–8.
259. Hoelscher PA, Springer AE, Brown HS, et al. Physical activity, watching television, and the risk of obesity in students, Texas, 2004–2006. *Prev Chronic Dis* 2011;8(3). Available at: [http://www.cdc.gov/pcd/issues/2011/may/10\\_0007.htm](http://www.cdc.gov/pcd/issues/2011/may/10_0007.htm). Accessed August 31, 2011.
260. Salmon J, Campbell KJ, Crawford DA. Television viewing habits associated with obesity risk factors: a survey of Melbourne schoolchildren. *Med J Aust* 2006;184:64–7.
261. Iannotti RJ, Kogan MD, Janssen I, et al. Patterns of adolescent physical activity, screen-based media use, and positive and negative health indicators in the U.S. and Canada. *J Adolesc Health* 2009;44:493–9.
262. Jackson DM, Djafarian K, Stewart J, et al. Increased television viewing is associated with elevated body fatness but not with lower total energy expenditure in children. *Am J Clin Nutr* 2009;89:1031–6.
263. Ozmert EN, Ozdemir R, Pektas A, et al. Effect of activity and television viewing on BMI z-score in early adolescents in Turkey. *World J Pediatr*. 2011;7:37–40.
264. Parvanta SA, Brown JD, Du S, et al. Television use and snacking behaviors among children and adolescents in China. *J Adolesc Health* 2010;46:339–45.
265. Adachi-Mejia AM, Longacre MR, Gibson JJ, et al. Children with a TV set in their bedroom at higher risk for being overweight. *Int J Obes (Lond)* 2007;31(4):644–51.
266. Barr-Anderson DJ, van den Berg P, Neumark-Sztainer D, et al. Characteristics associated with older adolescents. *Pediatrics* 2008;121:718–24.
267. Delmas C, Platat C, Schweitzer B, et al. Association between television in bedroom and adiposity throughout adolescence. *Obesity (Silver Spring)* 2007;15(10):2495–503.
268. Sisson SB, Broyles ST, Newton RL Jr, et al. TVs in the bedrooms of children: does it impact health and behavior? *Prev Med* 2011;52(2):104–8.
269. Stamatakis E, Hamer M, Dunstan DW. Screen-based entertainment time, all cause mortality, and cardiovascular events: population-based study with ongoing mortality and hospital events followup. *J Am Coll Cardiol* 2011;57(3):292–9.
270. Morrison JA, Glueck CJ, Daniels S, et al. Determinants of persistent obesity and hyperinsulinemia in a biracial cohort: a 15-year prospective study of schoolgirls. *J Pediatr* 2010;157:559–65.
271. Hardy LL, Denney-Wilson E, Thrift AP, et al. Screen time and metabolic risk factors among adolescents. *Arch Pediatr Adolesc Med* 2010;164:643–9.
272. Grøntved A, Hu FB. Television viewing and risk of type 2 diabetes, cardiovascular disease, and all-cause mortality: a meta-analysis. *JAMA* 2011;305(23):2448–55.

273. Mark AE, Janssen I. Relationship between screen time and metabolic syndrome in adolescents. *J Public Health* 2008;30(2):153–60.
274. Martinez-Gomez D, Tucker J, Heelan KA, et al. Associations between sedentary behavior and blood pressure in young children. *Arch Pediatr Adolesc Med* 2009;163:724–30.
275. Veerman JL, Healy GN, Cobiac LJ, et al. Television viewing time and reduced life expectancy: a life table analysis. *Br J Sports Med* 2011. Available at: <http://press.psprings.co.uk/bjasm/august/bjasm85662.pdf>. Accessed August 31, 2011.
276. Hardy LL, Bass SL, Booth ML. Changes in sedentary behavior among adolescent girls: a 2.5-year prospective cohort study. *J Adolesc Health* 2007;40:158–65.
277. Taveras EM, Field AE, Berkey CS, et al. Longitudinal relationship between television viewing and leisure-time physical activity during adolescence. *Pediatrics* 2007;119(2):e314–9.
278. Melkevik O, Torsheim T, Iannotti RJ, et al. Is spending time in screen-based sedentary behaviors associated with less physical activity: a cross national investigation. *Int J Behav Nutr Phys Act* 2010;7:46. Available at: <http://www.ijbnpa.org/content/7/1/46>. Accessed September 1, 2011.
279. Guthold R, Cowan MJ, Autenrieth CS, et al. Physical activity and sedentary behavior among schoolchildren: a 34-country comparison. *J Pediatr* 2010;157(1):43–9.
280. Cleland V, Venn A. Encouraging physical activity and discouraging sedentary behavior in children and adolescents. *J Adolesc Health* 2010;47:221–2.
281. Epstein LH, Roemmich JN, Cavanaugh MD, et al. The motivation to be sedentary predicts weight change when sedentary behaviors are reduced. *Int J Behav Nutr Phys Act* 2011;8:13. Available at: <http://www.ijbnpa.org/content/pdf/1479-5868-8-13.pdf>. Accessed August 31, 2011.
282. Leatherdale ST. Factors associated with communication-based sedentary behaviors among youth: are talking on the phone, texting, and instant messaging new sedentary behaviors to be concerned about? *J Adolesc Health* 2010;47:315–8.
283. Robinson TN. Reducing children's television viewing to prevent obesity: a randomized controlled trial. *JAMA* 1999;282(16):1561–7.
284. Epstein LH, Roemmich JN, Robinson JL, et al. A randomized trial of the effects of reducing television viewing and computer use on body mass index in young children. *Arch Pediatr Adolesc Med* 2008;162(3):239–45.
285. Maniccia DM, Davison KK, Marshall SJ, et al. A meta-analysis of interventions that target children's screen time for reduction. *Pediatrics* 2011;128(1):e193–210.
286. Graf DL, Pratt LV, Hester CN, et al. Playing active video games increases energy expenditure in children. *Pediatrics* 2009;124:534–40.
287. Daley AJ. Can exergaming contribute to improving physical activity levels and health outcomes in children? *Pediatrics* 2009;124:763–71.
288. Guy S, Ratzki-Leewing A, Gwady-Sridhar G. Moving beyond the stigma: systematic review of video games and their potential to combat obesity. *Int J Hypertens* 2011. Available at: <http://www.hindawi.com/journals/ijht/2011/179124/abs/>. Accessed August 31, 2011.
289. Peng W, Lin JH, Crouse J. Is playing exergames really exercising? A meta-analysis of energy expenditure in active video games. *Cyberpsychol Behav Soc Netw* 2011. Available at: <http://www.liebertonline.com/doi/abs/10.1089/cyber.2010.0578?journalCode=cyber>. Accessed August 31, 2011.
290. Harris JL, Schwartz MB, Brownell KD, et al. Evaluating fast food nutrition and marketing to youth. New Haven (CT): Yale Rudd Center for Food Policy & Obesity; 2010.

291. Powell LM, Szczypka G, Chaloupka FJ, et al. Nutritional content of television food advertisements seen by children and adolescents in the United States. *Pediatrics* 2007;120(3):576–83.
292. Kunkel D, McKinley C, Stitt C. Food advertising during children's programming: a two-year comparison. Tucson (AZ): University of Arizona; 2010.
293. Gantz W, Schwartz N, Angelini JR, et al. Food for thought: television food advertising to children in the United States. Menlo Park (CA): Kaiser Family Foundation; 2007.
294. Sutherland LA, MacKenzie T, Purvis LA, et al. Prevalence of food and beverage brands in movies: 1996–2005. *Pediatrics* 2010;125:468–74.
295. Moore ES. It's child's play: advergaming and the online marketing of food to children. Menlo Park (CA): Kaiser Family Foundation; 2006.
296. Montgomery KC, Chester J. Interactive food and beverage marketing: targeting adolescents in the digital age. *J Adolesc Health* 2009;45(Suppl 3):S18–29.
297. Weber K, Story M, Harnack L. Internet food marketing strategies aimed at children and adolescents: a content analysis of food and beverage brand Web sites. *J Am Diet Assoc* 2006;106:1463–6.
298. Lee M, Choi Y, Quilliam ET, et al. Playing with food: content analysis of food advergaming. *J Consum Aff* 2009;43:129–54.
299. Pempek TA, Calvert SL. Tipping the balance: use of advergaming to promote consumption of nutritious foods and beverages by low-income African American children. *Arch Pediatr Adolesc Med* 2009;163:633–7.
300. Institute of Medicine. Preventing childhood obesity: health in the balance. Washington, DC: National Academies Press; 2005.
301. Robinson TN, Borzekowski DLG, Matheson DM, et al. Effects of fast food branding on young children's taste preferences. *Arch Pediatr Adolesc Med* 2007;161:792–7.
302. Federal Trade Commission. Interagency working group seeks input on proposed voluntary principles for marketing food to children. 2011. Available at: <http://www.ftc.gov/opa/2011/04/foodmarket.shtm>. Accessed September 1, 2011.
303. Layton L. Food makers resist lawmakers' proposal for guidelines in marketing to children. 2011. Available at: [http://www.washingtonpost.com/politics/food-makers-resist-lawmakers-proposal-for-guidelines-in-marketing-to-children/2011/05/24/AFKf3mAH\\_story.html](http://www.washingtonpost.com/politics/food-makers-resist-lawmakers-proposal-for-guidelines-in-marketing-to-children/2011/05/24/AFKf3mAH_story.html). Accessed September 1, 2011.
304. Kunkel D, McKinley C, Wright P. The impact of industry self-regulation on the nutritional quality of foods advertised on television to children. Oakland (CA): Children Now; 2009.
305. Koplan JP, Brownell KD. Response of the food and beverage industry to the obesity threat. *JAMA* 2010;303:1487–8.
306. Levi J, Segal LM, St. Laurent R, et al. F as in fat 2011: how obesity threatens America's future. Washington, DC: Robert Wood Johnson Foundation; 2011.
307. Blass EM, Anderson DR, Kirkorian HL, et al. On the road to obesity: television viewing increases intake of high-density foods. *Physiol Behav* 2006;88(4–5):597–604.
308. Utter J, Neumark-Sztainer D, Jeffery R, et al. Couch potatoes or French fries: Are sedentary behaviors associated with body mass index, physical activity, and dietary behaviors among adolescents? *J Am Diet Assoc* 2003;103:1298–305.
309. Vereecken CA, Todd J, Roberts C, et al. Television viewing behavior and associations with food habits in different countries. *Public Health Nutr* 2005;9:244–50.
310. Barr-Anderson DJ, Larson NI, Nelson MC, et al. Does television viewing predict dietary intake five years later in high school students and young adults? *Int J*

- Behav Nutr Phys Act 2009;6:7. Available at: [www.ijbnpa.org/content/6/1/7](http://www.ijbnpa.org/content/6/1/7). Accessed August 31, 2011.
311. Strobele N, de Castro JM. Television viewing is associated with an increase in meal frequency in humans. *Appetite* 2004;42:111–3.
  312. Wiecha JL, Peterson KE, Ludwig DS, et al. When children eat what they watch: impact of television viewing on dietary intake in youth. *Arch Pediatr Adolesc Med* 2006;160(4):436–42.
  313. Harris JL, Bargh JA, Brownell KD. Priming effects of television food advertising on eating behavior. *Health Psychol* 2009;28(4):404–13.
  314. Chamberlain LJ, Wang Y, Robinson TN. Does children's screen time predict requests for advertised products? *Arch Pediatr Adolesc Med* 2006;160:363–8.
  315. Bell JF, Zimmerman FJ. Shortened nighttime sleep duration in early life and subsequent childhood obesity. *Arch Pediatr Adolesc Med* 2010;164(9):840–5.
  316. Lytle LA, Pasch K, Farbakhsh K. Is sleep related to obesity in young adolescents [abstract]? Presented at Pediatric Academic Societies meeting. Vancouver, British Columbia, Canada, May 2, 2010.
  317. Garaulet M, Ortega FB, Ruiz JR, et al. Short sleep duration is associated with increased obesity markers in European adolescents: effect of physical activity and dietary habits. The HELENA study. *Int J Obesity (Lond)* 2011. Available at: <http://www.nature.com/ijo/journal/vaop/ncurrent/full/ijo2011149a.html>. Accessed September 1, 2011.
  318. Taheri S. The link between short sleep duration and obesity: we should recommend more sleep to prevent obesity. *Arch Dis Child* 2006;91(11):881–4.
  319. Johnson JG, Cohen P, Kasen S, et al. Association between television and sleep problems during adolescence and early adulthood. *Arch Pediatr Adolesc Med* 2004;158(6):562–8.
  320. Dworak M, Schierl T, Bruns T, et al. Impact of singular excessive computer game and television exposure on sleep patterns and memory performance of school-aged children. *Pediatrics* 2007;120:978–85.
  321. Wells TT, Cruess DG. Effects of partial sleep deprivation on food consumption and food choice. *Psychol Health* 2006;21(1):79–86.
  322. Nelson MC, Gordon-Larsen P. Physical activity and sedentary behavior patterns are associated with selected adolescent health risk behaviors. *Pediatrics* 2006;117(4):1281–90.
  323. Van Cauter E, Holmback U, Knutson K, et al. Impact of sleep and sleep loss on neuroendocrine and metabolic function. *Horm Res* 2007;67(Suppl 1):2–9.
  324. Higuchi S, Motohashi Y, Liu Y, et al. Effects of playing a computer game using a bright display on presleep physiological variables, sleep latency, slow wave sleep and REM sleep. *J Sleep Res* 2005;14(3):267–73.
  325. Associated Press. More kids hospitalized for eating disorders. *USA Today* 2010. Available at: [http://www.usatoday.com/yourlife/health/medical/pediatrics/2010-11-30-eating-disorders\\_N.htm](http://www.usatoday.com/yourlife/health/medical/pediatrics/2010-11-30-eating-disorders_N.htm). Accessed September 2, 2011.
  326. Hogan MJ, Strasburger VC. Body image, eating disorders, and the media. *Adolesc Med State Art Rev* 2008;19(3):521–46.
  327. Field AE, Javaras KM, Aneja P, et al. Family, peer, and media predictors of becoming eating disordered. *Arch Pediatr Adolesc Med* 2008;162(6):574–9.
  328. Hayes S, Tantleff-Dunn S. Am I too fat to be a princess? Examining the effects of popular children's media on young girls' body image. *Br J Dev Psychol* 2010;28:413–26.
  329. Anschutz DJ, Spruijt-Metz D, Van Strien T, et al. The direct effect of thin ideal focused adult television on young girls' body figure. *Body Image* 2011;8:26–33.

330. Field AE, Camargo CA, Taylor CB, et al. Relation of peer and media influences to the development of purging behaviors among preadolescent and adolescent girls. *Arch Pediatr Adolesc Med* 1999;153(11):1184–9.
331. Abraham T. American Medical Association slams advertising industry for “exposing teens to bodies only attainable with the help of photo editing software.” *Daily Mail* 2011. Available at: <http://www.dailymail.co.uk/femail/article-2007532/American-Medical-Association-slams-advertising-industry-exposing-teens-bodies-attainable-help-photo-editing-software.html>. Accessed September 2, 2011.
332. Martínez-Gonzalez MA, Gual P, Lahortiga F, et al. Parental factors, mass media influences, and the onset of eating disorders in a prospective population based cohort. *Pediatrics* 2003;111(2):315–20.
333. Moriarty CM, Harrison K. Television exposure and disordered eating among children: a longitudinal panel study. *J Commun* 2008;58:361–81.
334. Becker AE. Eating behaviours and attitudes following prolonged exposure to television among ethnic Fijian adolescent girls. *Br J Psychiatry* 2002;180:509–14.
335. Borzekowski DL, Schenk S, Wilson J, et al. e-Ana & e-Mia: a content analysis of pro-eating disorder Websites. *Am J Public Health* 2010;100:1526–34.
336. Becker AE, Fay KE, Agnew-Blaise J, et al. Social network media exposure and adolescent eating pathology in Fiji. *Br J Psychiatry* 2011;198:43–50.
337. Levine MP, Murnen SK. “Everybody knows that mass media are/are not [pick one] a cause of eating disorders”: a critical review of evidence for a causal link between media, negative body image, and disordered eating in females. *J Soc Clin Psychol* 2009;28:9–42.
338. Nelson K. Structure and strategy in learning to talk. *Monogr Soc Res Child Dev* 1973;38(1-2):1–135. Serial 149.
339. Fisch SM, Truglio RT. “G” is for growing: thirty years of research on children and Sesame Street. Mahwah (NJ): Erlbaum; 2001.
340. Linebarger DL, Walker D. Infants’ and toddlers’ television viewing and language outcomes. *Am Behav Sci* 2005;48(5):624–5.
341. Tanimura M, Okuma K, Kyoshima K. Television viewing, reduced parental utterance, and delayed speech development in infants and young children. *Arch Pediatr Adolesc Med* 2007;161(6):618–9.
342. Zimmerman FJ, Christakis DA, Meltzoff AN. Associations between media viewing and language development in children under age 2 years. *J Pediatr* 2007;151(4):364–8.
343. Chonchaiya W, Pruksananonda C. Television viewing associates with delayed language development. *Acta Paediatr* 2008;97(7):977–82.
344. Mendelsohn AL, Berkule SB, Tomopoulos, et al. Infant television and video exposure associated with limited parent-child verbal interactions in low socioeconomic status households. *Arch Pediatr Adolesc Med* 2008;162:411–7.
345. Christakis DA, Gilkerson J, Richards J, et al. Audible television and decreased adult words, infant vocalizations, and conversational turns. *Arch Pediatr Adolesc Med* 2009;163(6):554–8.
346. Kirkorian HL, Pempek T, Murphy LA, et al. The impact of background television on parent-child interaction. *Child Dev* 2009;80:1350–9.
347. Schmidt ME, Rich M, Rifas-Shiman SL, et al. Television viewing in infancy and child cognition at 3 years of age in a US cohort. *Pediatrics* 2009;123:e370–5.
348. Richert RA, Robb MB, Fender JG, et al. Word learning from baby videos. *Arch Pediatr Adolesc Med* 2010;164:432–7.

349. Tomopoulos S, Dreyer BP, Berkule S, et al. Infant media exposure and toddler development. *Arch Pediatr Adolesc Med* 2010;164:1105–11.
350. DeLoache JS, Chiong C, Sherman K, et al. Do babies learn from baby media? *Psychol Sci* 2010;21:1570–4.
351. Krcmar M. Word learning in very young children from infant-directed DVDs. *Journal of Communication* 2011;61(4):780–94.
352. Brown A, Council on Communications and Media. Infant media use. *Pediatrics* 2011;128:1040–5.
353. Mendelsohn AL, Brockmeyer CA, Dreyer BP, et al. Do verbal interactions with infants during electronic media exposure mitigate adverse impacts on their language development as toddlers? *Infant Child Dev* 2010;19:577–93.
354. Richert R, Fender J. Parents' use of a DVD to teach toddlers' language. Presented at International Communication Association conference. Boston, MA, May 28, 2011.
355. Kuhl PK, Tsao FM, Liu HM. Foreign-language experience in infancy: effects of short-term exposure and social interaction on phonetic learning. *Proc Natl Acad Sci U S A* 2003;100:9096–101.
356. Christakis DA, Zimmerman FJ, DiGiuseppe DL, et al. Early television exposure and subsequent attentional problems in children. *Pediatrics* 2004;113(4):708–13.
357. Zimmerman FJ, Christakis DA. Associations between content types of early media exposure and attentional problems. *Pediatrics* 2007;120:986–92.
358. Swing EL, Gentile DA, Anderson CA, et al. Television and video game exposure and the development of attention problems. *Pediatrics* 2010;126:214–21.
359. Acevedo-Polakovich ID, Lorch EP, Milich R, et al. Disentangling the relation between television viewing and cognitive processes in children with attention deficit/hyperactivity disorder and comparison children. *Arch Pediatr Adolesc Med* 2006;160(4):354–60.
360. Chonchaiya W, Nuntnarumit P, Pruksananonda C. Comparison of television viewing between children with autism spectrum disorder and controls. *Acta Paediatr* 2011;100:1033–7.
361. Hancox RJ, Milne BJ, Poulton R. Association of television viewing during childhood with poor educational achievement. *Arch Pediatr Adolesc Med* 2005;159(7):614–8.
362. Zimmerman FJ, Christakis DA. Children's television viewing and cognitive outcomes: a longitudinal analysis of national data. *Arch Pediatr Adolesc Med* 2005;159(7):619–25.
363. Borzekowski DL, Robinson TN. The remote, the mouse, and the No. 2 pencil: the household media environment and academic achievement among third grade students. *Arch Pediatr Adolesc Med* 2005;159(7):607–13.
364. Sharif I, Sargent JD. Association between television, movie, and video game exposure and school performance. *Pediatrics* 2006;118:e1061–70.
365. Sharif I, Wills TA, Sargent JA. Effect of visual media use on school performance: a prospective study. *J Adolesc Health* 2010;46:52–61.
366. Weis R, Cerankosky BC. Effects of video-game ownership on young boys' academic and behavioral functioning: a randomized, controlled study. *Psychol Sci* 2010. Available at: <http://pss.sagepub.com/content/early/2010/02/17/0956797610362670.abstract>. Accessed September 3, 2011.
367. Mossle T, Leimann M, Rehbein F, et al. Media use and school achievement—boys at risk? *Br J Dev Psychol* 2010;38(Pt 3):699–725.
368. Gould M, Jamieson P, Romer D. Media contagion and suicide among the young. *Am Behav Sci* 2003;46:1269–84.

369. Romer D, Jamieson PE, Jamieson KH. Are news reports of suicide contagious? A stringent test in six US cities. *J Commun* 2006;56(2):253–70.
370. Centers for Disease Control and Prevention (CDC): Guidelines for reporting suicide in the media. Available at: [http://www.afsp.org/files/Misc\\_/recommendations.pdf](http://www.afsp.org/files/Misc_/recommendations.pdf). Accessed September 3, 2011.
371. Biddle L, Donovan J, Hawton K, et al. Suicide and the Internet. *BMJ* 2008;336:800–2.
372. Dunlop SM, More E, Romer D. Where do youth learn about suicides on the Internet, and what influence does this have on suicidal ideation? *J Child Psychol Psychiatry* 2011. Available at: <http://onlinelibrary.wiley.com/doi/10.1111/j.1469-7610.2011.02416.x/full>. Accessed September 3, 2011.
373. Primack BA, Swanier B, Georgiopoulos AM, et al. Association between media use in adolescence and depression in young adulthood: a longitudinal study. *Arch Gen Psychiatry* 2009;66:181–8.
374. Kappos AD. The impact of electronic media on mental and somatic children's health. *Int J Hyg Environ Health* 2007;210:555–62.
375. Hamer M, Stamatakis E, Mishra G. Psychological distress, television viewing, and physical activity in children aged 4 to 12 years. *Pediatrics* 2009;123:1263–8.
376. Pagani LS, Fitzpatrick C, Barnett TA, et al. Prospective associations between early childhood television exposure and academic, psychosocial and physical well-being by middle childhood. *Arch Pediatr Adolesc Med* 2010;164:425–31.
377. Page AS, Cooper AR, Griew P, et al. Children's screen viewing is related to psychological difficulties irrespective of physical activity. *Pediatrics* 2010;126:e1011–7.
378. Lam LT, Peng Z- W. Effect of pathological use of the Internet on adolescent mental health. *Arch Pediatr Adolesc Med* 2010;164:901–6.
379. Hearold S. A synthesis of 1,043 effects of television on social behavior. In: Comstock G, editor. *Public communication and behavior*, vol. 1. New York: Academic Press; 1986. p. 65–133.
380. Mares L, Woodard E. Positive effects of television on children's social interactions: a meta-analysis. *Media Psychol* 2005;7(3):301–22.
381. Madsen K, Yen S, Wlasiuk L, et al. Feasibility of a dance videogame to promote weight loss among overweight children and adolescents. *Arch Pediatr Adolesc Med* 2007;161(1):105–7.
382. Bailey BW, McInnis K. Energy cost of exergaming. *Arch Pediatr Adolesc Med* 2011;165(7):597–602.
383. Sallis J. Potential vs. actual benefits of exergames. *Arch Pediatr Adolesc Med* 2011;165(7):667–9.
384. Graves LEF, Ridgers ND, Williams K, et al. The physiological cost and enjoyment of Wii Fit in adolescents, young adults, and older adults. *J Phys Activ Health* 2010;7(3):393–401.
385. Anderson D, Huston A, Schmitt K, et al. Early childhood television viewing and adolescent behavior: the Recontact Study. *Monogr Soc Res Child Dev* 2001;66(1):1–147.
386. Crawley AM, Anderson DR, Santomero A, et al. Do children learn how to watch television? The impact of extensive experience with “Blue's Clues” on preschool children's television viewing behavior. *J Commun* 2002;5292:264–80.
387. Boyd D. Taken out of context: American teen sociality in networked publics [doctoral dissertation]. Berkeley (CA): University of California; 2008.
388. Kirkorian HL, Wartella EA, Anderson DR. Media and young children's learning. *Future Child* 2008;18(1):39–61.

389. Strasburger VC, Hogan MJ, Council on Communications and Media. Media education (policy statement). *Pediatrics* 2010;126(5):1012–7.
390. Rideout V. Parents, children, and media. Menlo Park (CA): Kaiser Family Foundation; 2007.
391. Jordan A, Hersey J, McDivitt J, et al. Reducing children's television-viewing time: a qualitative study of parents and their children. *Pediatrics* 2006;118(5):e1305–10, xxx.
392. Wahi G, Parkin PC, Beyene J, et al. Effectiveness of interventions aimed at reducing screen time in children. *Arch Pediatr Adolesc Med* 2011;165(11):979–86.
393. Strasburger VC. Media and children: what need to happen now? *JAMA* 2009;301(21):2265–6.
394. Longacre MR, Adachi-Mejia AM, Titus-Ernstoff L, et al. Parental attitudes about cigarette smoking and alcohol use in the Motion Picture Association of America rating system. *Arch Pediatr Adolesc Med* 2009;163(3):218–24.
395. Woodard E, Gridina N. Media in the home. Philadelphia: University of Pennsylvania Annenberg Public Policy Center; 2000.
396. O'Keefe GS, Clarke-Pearson K, Council on Communications and Media. Clinical report: the impact of social media on children, adolescents, and families. *Pediatrics* 2011;127:800–4.
397. Barkin SL, Finch SA, Ip EH, et al. Is office-based counseling about media use, timeouts, and firearm storage effective? Results from a cluster-randomized, controlled trial. *Pediatrics* 2008;122(1):e15–25.
398. Jackson C, Brown JD, Pardun CJ. A TV in the bedroom: implications for viewing habits and risk behaviors during early adolescence. *J Broadcast Electronic Media* 2008;52(3):349–67.
399. Strasburger VC. Children, adolescents, and the media: what we know, what we don't know, and what we need to find out (quickly!). *Arch Dis Child* 2009;94(9):655–7.
400. Kirby D, Laris BA. Effective curriculum based sex and STD/HIV education programs for adolescents. *Child Dev Perspect* 2009;3(1):21–9.
401. McCannon B. Media literacy/media education: solution to big media? A review of the literature. In: Strasburger VC, Wilson BJ, Jordan A, editors. *Children, adolescents, the media*. 2nd edition. Thousand Oaks (CA): Sage; 2009. p. 519–69.
402. Rosenkoetter LI, Rosenkoetter SE, Acock AC. Television violence: an intervention to reduce its impact on children. *J Appl Dev Psychol* 2008;30(4):381–97.
403. Primack BA, Hobbs R. Association of various components of media literacy and adolescent smoking. *Am J Health Behav* 2009;33(2):192–201.
404. Primack BA, Sidani J, Carroll MV, et al. Associations between smoking and media literacy in college students. *J Health Commun* 2009;14(6):541–55.
405. Strasburger VC. School daze: why are teachers and schools missing the boat on media? *Pediatr Clin North Am* 2012. [Epub ahead of print].
406. Up in smoke: Disney bans cigarettes. ABCnews.com; 2007. Available at: <http://abcnews.go.com/GMA/story?id=3416434&page=1>. Accessed December 1, 2011.
407. American Academy of Pediatrics, Committee on Communications. Children, adolescents, and advertising. *Pediatrics* 2006;118(6):2563–9.
408. Brownell KD, Schwartz MB, Puhl RM, et al. The need for bold action to prevent adolescent obesity. *J Adolesc Health* 2009;45(3S):S8–17.
409. Stitt C, Kunkel D. Food advertising during children's television programming on broadcast and cable channels. *Health Commun* 2008;23(6):573–84.

410. Jordan A, Kramer-Golinkoff E, Strasburger VC. Do the media cause obesity and eating disorders? *Adolesc Med State Art Rev* 2008;19(3):431–49.
411. Jordan AB, Robinson TN. Children, television viewing, and weight status: summary and recommendations from an expert panel meeting. *Ann Am Acad Pol Soc Sci* 2008;615(1):119–32.
412. Harris JL, Pomeranz JL, Lobstein T, et al. A crisis in the marketplace: how food marketing contributes to childhood obesity and what can be done. *Annu Rev Public Health* 2009;30:211–25.
413. Ofcom. Children watching fewer TV adverts for less healthy foods, review finds. 2008. Available at: <http://media.ofcom.org.uk/2008/12/17/children-watching-fewer-tv-adverts-for-less-healthy-foods-review-finds/>. Accessed December 1, 2011.
414. Dixon HG, Scully ML, Wakefield MA, et al. The effects of television advertisements for junk food versus nutritious food on children's food attitudes and preferences. *Soc Sci Med* 2007;65(7):1311–23.
415. Livingstone S, Haddon L, Gorzig A, et al. EU Kids Online: Final report. LSE. London: EU Kids Online; 2011. Available at: <http://www2.lse.ac.uk/media@lse/research/EUKidsOnline/Home.aspx>. Accessed December 1, 2011.
416. Simon M. Junk food industry determined to target kids. 2011. Available at: <http://www.foodsafetynews.com/2011/07/junk-food-industry-determined-to-target-kids/>. Accessed December 1, 2011.
417. Speers SE, Harris JL, Schwartz MB. Child and adolescent exposure to food and beverage brand appearances during prime-time television programming. *Am J Prev Med* 2011;41(3):291–6.
418. Wilson BJ, Kunkel D, Drogos KL. Educationally/insufficient? An analysis of the availability & educational quality of children's E/I programming. Oakland (CA): Children Now; 2008. Available at: [http://www.childrennow.org/uploads/documents/eireport\\_2008.pdf](http://www.childrennow.org/uploads/documents/eireport_2008.pdf). Accessed December 1, 2011.
419. Eggerton J. FCC to revisit kids TV rules. *Broadcast Cable*. 2009. Available at: [http://www.broadcastingcable.com/article/316123-FCC\\_To\\_Revisit\\_Kids\\_TV\\_Rules.php](http://www.broadcastingcable.com/article/316123-FCC_To_Revisit_Kids_TV_Rules.php) Accessed December 1, 2011.
420. Christakis DA, Zimmerman FJ. Media as a public health issue. *Arch Pediatr Adolesc Med* 2006;160:445–6.