

1 **Planned Adaptive Regulation and Knowledge Assessment for**
2 **Video Games and Virtual Reality**

3 MIT Science, Technology and Public Policy 17.309 Final Paper

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6
7 **1. Introduction**

8 Video games have long been at the center of a heated debate on the social consequences
9 of violent media. They have been accused of spreading violence in the society by triggering
10 several murder crimes and manipulating individuals', especially children's, mental health and
11 psychology. Despite the controversies, today, 155 million Americans from all ages spend an
12 average of 6.3 hours every week on video games (Aamoht, 2014; Theesa, 2015). Around the
13 world, people spend more than \$100bn for gaming. While video games and media present a
14 limited interactive experience with a 2D screen and optionally a console, Virtual Reality (VR)
15 immerses users to virtual worlds where any dream may be possible. VR has and will find
16 applications in various areas ranging from gaming to education and the VR products have
17 already attracted more than \$4bn investment (Vanian, 2015). In the past, VR technologies have
18 had constrained use cases in military training, and research points to the effectiveness of virtual
19 experiences in psychotherapy and education.

20 The emergence of VR devices in 2016 has again sparked arguments about how to assess
21 the risks pertaining to the media, especially to VR games and its predecessor video games, and
22 about how to put regulations in the best interest of the society. In this paper, I will analyze the
23 video game regulations in place to mitigate risks of the technology, how the regulations came to
24 be and how the video games example can establish a basis for addressing some of the short-term
25 and long-term potential psychological risks of VR technology. I will analyze Federal Trade
26 Commission's (FTC) role in addressing short-term risks and American Psychology Association's
27 (APA) efforts to assess the long-term risks of video games and virtual reality. I will show how
28 planned adaptation has been used successfully by FTC and APA in enforcing socially beneficial
29 regulations in different cases and how planned adaptation can be applied to video games and
30 virtual reality.

31

32 **2. The History and Controversy of Video Games**

33 The first commercial video games appeared in the early 70s (Cohen, 2016). Since then,
34 there have been games with controversially violent and sexual content. Death Race portraying
35 users driving over creatures called media attention with its disturbing theme and sounding
36 effects. Custer's Revenge let users control a naked man to reach to an Indian woman tied to a
37 wooden pole to rape her (Plunkett, 2011). The game triggered outrages from Indian's and
38 Women's rights representatives and Atari attempted to sue the game company (Ocala Star-
39 Banner, 1982). While both of the games had very poor graphics to be even considered violent by
40 today's standards, for the first time, they raised questions about what side effects video games
41 might have on players and what should be considered appropriate entertainment. The game
42 industry crashed in 1983 after the overwhelming increase in low-quality games, the pirate game
43 sells and saturation in the market. With demands for higher standards in the industry, Nintendo
44 of America, a major console manufacturer, put licensing requirements for the games and a lock
45 system for its consoles that permits only the licensed games to fight piracy. Nintendo also set
46 policies censoring references to tobacco, alcohol, sexuality and violence in games (GamesRadar,
47 2009).

48 In the 90s, the graphics and sound qualities of games significantly increased. Console
49 manufacturers had their own rating systems based on age or intensity, and they had differing
50 opinions on restricting violent and sexual content (Chalk, 2007). Nintendo retained its strict
51 content policy and continued censoring content that may be perceived as improper, while Sega
52 put its own age rating system together (Harris, 2006). In 1992, Joe Lieberman of Connecticut and
53 Herb Kohl of Wisconsin started hearings on complaints to games rendering highly violent and
54 sexually explicit content. In 1993 December, a joint congressional hearing took place. Observing
55 the disunity between the major game developers in resolving the content policies, Lieberman
56 proposed the Video Game Rating Acts of 1994. The act described a federal commission
57 addressing the policies regarding video games (Video Game Rating Act, 1994). At the same
58 time, Senator Kohl had a self-regulatory system in mind, similar to the regulation of motion
59 picture: "We want you to develop a voluntary rating system; we want you to let parents know
60 what they are buying for their children. We would prefer self-regulation to Government
61 regulation. But we are prepared to move ahead if your efforts falter: Regulate yourselves or we

62 will have to do it for you.” (Kenyota, 2008). These steps would lead to a self-regulatory
63 organization led by the game industry.

64

65 **3. The ESRB and Game Regulation**

66 Concerned with the business risks of government regulation, Nintendo, Sega, Electronic
67 Arts and others convened to establish an umbrella organization, Interactive Digital Software
68 Association, later Entertainment Software Ratings Board (ESRB), that would standardize the
69 video game content policies. ESRB adapted the rating categories of "Early Childhood", "Kids to
70 Adults" (later renamed "Everyone" (E) in 1998), "Teen" (T), "Mature" (M), and "Adults Only"
71 (AO) to protect minors from negative effects of video games. Later, the E10+ category was
72 added and these categories have not changed over time (Kohler, 2009).

73 Since then, ESRB has been managing the rating process for video games and enforcing
74 various policies to ensure that the consumers properly receive the content ratings of video games.
75 Rating information is presented in compliance with various principles and guidelines regarding
76 the advertisement and packaging of games. In cases of serious content non-disclosure and other
77 violations, ESRB enforces fines up to \$1 million and product recall. This is especially the case
78 for violations of boxed games that are harder to replace or update. Digitally distributed games are
79 usually subject to software updates if parts of the game content do not comply with rating given
80 to the game.

81 While ratings had been granted based on independent reviews by anonymous reviewers
82 in the past, the Global Ratings by International Age Rating Coalition has centralized the content
83 rating process. It has enabled digital developers to self-assess the content through an online
84 system and publish their games with the appropriate rating marks for different countries. The
85 system does not constrain or alter the policies of any of the game regulatory organizations, but it
86 empowers developers to easily comply with various policies around the world through a single
87 assessment survey. If a self-assessment is flawed, ESRB can later warn the developers based on
88 customer feedback (www.globalratings.com, 2017).

89 While ESRB ratings are voluntary, most of the retailers and game distributors do not
90 handle games that do not have ESRB rating. This establishes a voluntary but practically

91 obligatory reason for game developers to comply with the ESRB standards. Usually, developers
92 change game content based on the feedback from ESRB to avoid adult-only content, because
93 most retailers do not sell adult-only games. ESRB also works closely with retailers to ensure that
94 retailers inform the customers on the ratings and do not sell M-rated or above games to minors.
95 ESRB does so without the authority to sanction the retailers for violating its policies (ESRB
96 Enforcement).

97 According to FTC’s regular inspections, game retailers follow the sales guidelines most
98 rigorously among all entertainment businesses. Retail sales of M-rated games to minors have
99 decreased from 85% to 13% from 2000 to 2011, while sales to minors can be as high as 60% in
100 other entertainment industries (FTC Undercover Shopper Survey, 2011). We will examine how
101 the success of ESRB enforcement has increased with the planned adaptive changes that ESRB
102 has adapted with FTC reviews.

103

104 **4. Planned Adaptive Approach and Protection of Minors in Video Game**

105 Planned Adaptation processes are regulative and policy-making processes by which the
106 policies are revised “when relevant new knowledge appears”, and steps are taken to “produce
107 such improved knowledge” (McCray, 2009). Planned Adaptation approach has shown to be more
108 effective than permissive and precautionary approaches in policy areas where there are high
109 levels of uncertainty and rapid change, especially policies for emerging technologies. Video
110 games fall into this category. The industry practices and scope have been rapidly changing in
111 gaming from mere hobby in the 80s, to a market of the console, PC, mobile and Internet games
112 today, and it is further changing with the arrival of virtual reality.

113 The regulation of video games have been enforced by ESRB through voluntary
114 participation since 1994, and the revision and improvement of the regulatory process have been
115 evaluated by Federal Trade Commission (FTC) since 1999. FTC started reviewing “the industry
116 practices in the motion picture, music recording and electronic game industries” (FTC, 2000) to
117 report on violent entertainment regulation for children upon President Clinton’s request after the
118 Columbine High School massacre that raised serious concerns about crime tied to violent games
119 (FTC, 2000). There have been 8 reports since 2000 with the most recent release in 2013 in the
120 form of a press release. The reports aim to inform three major decision makers - the policy

121 makers, game industry, and parents. Reports include field surveys and evaluations on the
122 efficacy of the existing organizations, mainly the ESRB for games, in enforcing video game
123 regulations and putting FTC's previous recommendations into action, not only for violence but
124 also any content that could be improper for minors. FTC makes recommendations for further
125 improving the quality of the existing regulations and points to new trends that ESRB should be
126 aware of.

127 The first report in September 2000 describes several concerning issues with the
128 regulatory practices by the ESRB. The commission conducted several surveys with parents,
129 retailers, and advertisers on issues including public awareness for ratings, and selling and
130 marketing M-rated and Adult-only games to children. Most children had access to M-rated
131 games at retail stores; some M-rated video game ads were accessible to minors, alluding them to
132 violent games, and parents were unaware of the existence or importance of ratings. The report
133 proposed several steps that the industry and ESRB should take, including revising the ESRB
134 codes to regulate the ad content of media with majority minor consumers, informing parents
135 through packaging and internet media, and ensuring consequences to ESRB regulation violations
136 (FTC, 2000).

137 The following year in December 2001, FTC conducted follow-up surveys to evaluate
138 how its recommendations were implemented. For example, in "undercover shopper survey", the
139 surveyors attempted to buy M-rated games at retail stores as minors. The FTC report compares
140 the outcomes of the surveys in 2000 and 2001 and concludes that ESRB has shown progress in
141 enforcing the retail store policies (FTC, 2001). Reports follow in 2002, 2004, 2007 and 2009.
142 FTC consistently measures the effectiveness of the ESRB, compares its effectiveness with the
143 previous years and provides further suggestions. For example, in 2007, the commission, based on
144 its consumer research, suggested ESRB investigates why parents think that ESRB could inform
145 them better (FTC, 2007). Following FTC's recommendation, ESRB conducted surveys and focus
146 groups and concluded that providing more detailed information on ratings to the parents would
147 be useful. Since July 2008, ESRB provides in-depth ratings for each rating title (FTC, 2008).
148 Here we observe that this self-regulatory system follows the planned adaptive framework. As
149 FTC reveals new information on the effectiveness of the policies, it reviews the existing policies
150 and how they are implemented. FTC then makes recommendations to the ESRB for properly

151 revising the policies to better enforce its standards. FTC plans to regularly produce knowledge
152 about the policies' effectiveness and advises ESRB to do so in areas of improvement.

153 This adaptive learning approach is effective in the video game case for several reasons.
154 The ESRB has incentives to follow the recommendations without any sanctions by the FTC,
155 while the FTC can conduct objective evaluations of the ESRB and the technology. First, the
156 ESRB was formed after federal regulation threats to games, and since then until 2011 Supreme
157 Court decision, several states had attempted to regulate video games and ban selling games to
158 minors. The ESRB can only stand the time as long as the public and the FTC are happy with the
159 ESRB regulations. Second, the ESRB ratings are robust. The video games used to be rated by
160 three people without any ties and anonymous to the industry. Nowadays, it is a self-rating
161 process through www.globalratings.com. Third, the FTC and the ESRB are separate bodies that
162 do not have any conflict of interests. Fourth, the FTC is incentivized to protect the interests of
163 the citizens, since improper ratings or legislation can easily spark a national uproar, as in the case
164 of Hot Coffee, a hidden mode in the GTA game that reveals explicitly sexual content (Lohr,
165 2005).

166 On the other hand, permissive or precautionary approaches to video games regulation
167 could prove ineffective or less beneficial for the society. In fact, almost no significant progress
168 was made in enforcing the ESRB standards until the FTC's reviews started. While the retail sales
169 of M-rated games to minors stayed around 85% from 1994 to 2000, it has dropped to 13% by
170 2011 since the FTC reviews has started. The FTC did more than ensuring that the ESRB
171 functions effectively. As we discussed above, it proposed new policies for effectively addressing
172 the regulatory challenges and followed emerging media trends such as the internet to form the
173 necessary regulative response. This indicates that a completely permissive approach could result
174 in a scenario where no age ratings would be enforced for protecting children from side effects of
175 video games. A precautionary approach could upright ban the sales of some games on void
176 grounds, limiting the creativity and production of game developers.

177 In the same reports, FTC seems to implement a planned adaptive policy framework for
178 movies and music industries by evaluating the conduct of motion picture and music industries.
179 The reports repeatedly state that game industry is the most successful among motion picture,
180 music and game industries in implementing the self-regulatory system. While evaluating the

181 policy-making mechanism for motion picture and music industries is beyond the scope of this
182 paper, it is worth pursuing for the future.

183

184 **5. The Limitations of the ESRB and Recommendations for the FTC**

185 There are limitations to the self-regulatory, adaptive system of the ESRB. Each FTC
186 report concludes with a paragraph calling out for the involvement of the industry leaders and
187 public. As Commissioner Orson Swindle stated at the end of the 2002 report, “if the public wants
188 a change in these marketing practices, the public must demand that change and express its wishes
189 in the currency of the marketplace”. If the public awareness for and interest in ensuring
190 protection from the adverse effects of the video games die out, the ESRB and the FTC would
191 have less incentive to work towards enforcing the regulations in the way most beneficial to the
192 society. The government would feel have less pressure to protect the minors from problems that
193 may come with the video games, and the FTC program could then even be abolished. If there are
194 no public complaints, the ESRB can easily ignore content disclosure violations or fail to enforce
195 proper sanctions to games violating its policies.

196 In fact, the latter may become the case especially if there are conflicts of interest within
197 the ESRB. Video game industry leaders on the ESRB board can influence the way how their own
198 games are treated by the organization. The industry leaders would be incentivized to produce
199 games with types of violent content that attract children and take soft stands on sanctioning their
200 own games. This may have been happening for some of the most controversial ESRB decisions,
201 including the Grand Theft Auto (GTA). GTA games simulate a realistic world where players can
202 gamble, explicitly kill, and arrange prostitutes. With its violent, abusive, sexually explicit
203 content, the game has long been central to the video game debates. However, the game has never
204 been rated as adult-only, or policy steps were taken to re-evaluate standards for adult-only with
205 emergence of new game genres like GTA. The critics argue that since rating games as adult-only
206 limits games’ market reach and can diminish sales significantly, the ESRB have strong interest in
207 avoiding the adult-only rating, because some games with high success potential may otherwise
208 be categorized as adult-only. While it is unclear if such improprieties have ever been the case,
209 there are potential grounds for conflict of interest. For example, Strauss Zelnick, a chairman for
210 the ESRB board, is also the CEO of Take Two Games that develops the GTA series. Since the
211 public is invested in the video games cause, the conflict of interest has not become a major

212 problem for the organization. In any case, such issues of conduct should be included in the FTC
213 reviews. The FTC should investigate if the conflicts of interests have any impact on individual
214 game rating cases. Right now, the FTC only focuses on the outcome of the ESRB enforcement,
215 not the process of the enforcement.

216 Moreover, the FTC seems to be falling short in the last 5 years in describing the emerging
217 trends, and recommending action for recent technologies, which is the knowledge producing and
218 evaluative component of the planned adaptation. After 2009, there hasn't been a comprehensive
219 FTC report other than the commission press releases in 2011 and 2013 that does not address or
220 follow up with most of the points from the 2009 report. In the meantime, mobile apps have
221 become prevalent and VR games have been emerging. FTC has not researched or published on
222 mobile apps or VR games yet, although VR games will include violent actions in potentially
223 more influential ways requiring serious attention. Only after 2015 has the ESRB ratings become
224 available at Google Play, the Android mobile app store.

225 Finally, FTC should investigate how emerging gaming platforms that establish its own
226 rating standards comply with the ESRB standards. The Apple iTunes App Store for mobile
227 applications for iPhones and Oculus Experiences for Oculus' VR applications have their own
228 standards and rating procedure. Although their ratings seem to parallel the ESRB ratings, FTC
229 should still ensure the coherency across existing and emerging technologies.

230

231 **6. Adverse Psychological Effects of Video Games:**

232 So far, we have discussed the historical development of video games and regulative
233 responses to reduce risks for minors who may be affected by the media content. These responses
234 follow the trajectory of the entertainment regulation. Motion picture and television has long been
235 rated similarly, and it could be expected that video games were going to be subject to a similar
236 regulatory process. On the other hand, there has been an ongoing scientific debate about what
237 type of media content is actually harmful for children, if some of the video game content
238 psychologically manipulate their consumers, if such effects hold not only for children, but also
239 for adults and if these effects are worth policy attention.

240 There are two types of potential psychological effects of video games. First, there are
241 short-term effects that can be more easily observed. The regulations I have discussed so far aim
242 to reduce risks of short-term harms on children who may be vulnerable to various content and

243 engagement in video games and may develop abnormal behaviors in a “short” amount of time. I
244 will present below examples that are attributed as video games’ short-term effects. One of the
245 arguments for not regulating games for adults is that adults can choose what is right for them,
246 and they would not be affected significantly from violent or abusive media. This leads us to the
247 distinction of video games’ long-term effects. Some research argues that video games may have
248 long-term, cumulative influence on individuals. Video games may be making the consumers
249 more aggressive over the span of years in a subtle way that the consumers do not realize. As
250 more people are exposed to TV and video games with violent, aggressive, and misleading
251 content, our reactions and behaviors may be shifting towards more aggressive, less empathetic
252 and so forth. These potential long-term effects of video games are very tough to point to and may
253 be the outcome of numerous other factors over years as much as the outcomes of video games.

254 Short-term and long-term adverse effects of video games have long been a scientific
255 controversy. Since 80s, there has been conflicting research on video games’ negative and
256 positive psychological effects on the consumers. In 2015, the American Psychological
257 Association (APA) published the “Technical Report on the Review of the Violent Media Game
258 Literature” that revises a similar APA report from 2005 and reviews the academic literature
259 between 2005 and 2015 on video games in depth. The report was carried out by the APA Task
260 Force on violence media in a similar fashion by which the APA reviewed important social issues
261 such as sexual orientation and discrimination. The report demonstrates that there is “an
262 association between violent video game use and both increases in aggressive behavior,
263 aggressive affect, aggressive cognitions and decreases in prosocial behavior, empathy, and moral
264 engagement” and describes video games’ impacts on aggressive behavior as robust. The impact
265 of violent video games is claimed to be long lasting as shown by long-term studies. However, the
266 report remarks that there are some methodological issues with the collection of studies, including
267 the measures used, the sample distributions, small and varied sample sizes and inconsistent
268 metrics.

269 The APA report and similar studies suggesting negative effects of video games have
270 been disputed with the claims of methodological issues. In 2013, 228 scholars and academics
271 around the world published an open letter to refute the APA’s 2005 violent media statement and
272 pointed to potential problems regarding the ongoing report for 2015. The report underlined that
273 the laboratory experiments are not externally valid, that there is a negative correlation between

274 video games and crime rates in populous cities, and that the self-selecting academic process for
275 “positive” findings providing evidence for the link between aggression and video game violence
276 manipulates the scientific discourse (The Media Coalition, 2013).

277 Even if the APA’s conclusions are robust, the conclusions do not tell anything about how
278 serious the aggression is invoked by violent video games. As long as the intensity of the
279 increased aggression or other psychological reactions is not scientifically established, the
280 research is very unlikely to affect policy decisions. The challenge of the long-term effects of
281 video games is to properly investigate how video game use may be subtly altering human
282 behavior and how this change brings about higher crime rate, gun violence or other problems.

283 The same inconclusiveness arguments for short-term effects of video games can be made.
284 Unfortunately, it is very tough to explicitly link video gaming to serious crimes, because video
285 games’ effects are psychological, and psychological factors are harder to measure without
286 explicit statements of the crime makers. Yet, there are crime cases around the world suggesting
287 adverse short-term effects, or at least convincing the public that there may be negative effects of
288 video games. In 2003, Devin Moore, 18-year-old American, murdered two policemen and
289 another man after being arrested for stealing a vehicle. Moore told the police “Life is like a video
290 game. Everybody's got to die sometime.” Devin’s moral engagement and empathy was possibly
291 diminished after his engagement with video games (Leung, 2005). In 2007, Daniel Petric killed
292 her mother and wounded his father by shooting them to head. His parents took away his favorite
293 video game Halo 3, a first-person shooter game where players kill aliens, and they locked the
294 game to a lockbox where the father keeps his pistol. Stealing the box’s key, Daniel took the
295 game and grabbed the gun to shoot his parents. The Judge Burge stated his belief that “Daniel
296 Petric had no idea at the time he hatched this plot that if he killed his parents they would be dead
297 forever”, while he rejected the notion that Daniel had become psychologically insane due to the
298 game. Daniel perhaps lost his moral engagement as well as developed strong aggressive behavior
299 tied to the game (Daily Telegraph, 2013). In 2012, a 13-years-old cut his friend’s throat after
300 playing Gears of War 3 together. The research team investigating the issue concluded that
301 violent games may foster the conviction that conflict and anger can be dealt with aggression
302 (Yin-Poole, 2013). The actors of the crimes were immersed in the game in a way that the death
303 and violence in the game did not seem to be any different to him from that in the real life, and
304 violence and aggression in the game may have had spillover effects to real life. These incidences

305 suggest that aggressive behavior, lack of empathy and moral disengagement might be triggered
306 by video games.

307

308 **7. Psychology Research and Regulation**

309 The short-term effects of the video games can be mitigated by the existing regulatory
310 structure, and in practice, the ESRB approach seems to be working. However, the scientific basis
311 for the ratings is not well established. APA recommends revisions and detailed the ratings, but
312 the basis for this recommendation is subject to criticism itself. The ESRB only accounts for
313 protecting minors and the discussions on the psychological impacts of video games to young
314 adults and beyond in the long-term has always been secondary at best. The scientific evidence on
315 long-term effects for restricting video game use for adults and further limiting minors' access to
316 video games seems to be inconclusive. In fact, in 2011, Supreme Court pointed to the flaws in
317 the psychology research on violent media to withhold the California ban on selling M-rated
318 video games to minors, and argued that the video games are protected as speech (Supreme Court,
319 2011).

320 Though more than 30 years past, the scientific community could not yet come to a
321 consensus about the adverse effects of video games. Not only adverse effects, but positive effects
322 are not clear. While there is research describing the positive contributions of video games to
323 children's learning, the benefits of educational games are still unclear. If a collective and
324 systematic effort is not directed towards understanding the implications of the technology, we
325 may only arrive to a suboptimal outcome. This discussion leads us asking several questions on
326 psychology research.

327 How and by whom should the psychology research be conducted and advocated that the
328 research can establish proper knowledge assessment for important social and political issues?
329 How can better tools and incentives be developed to establish better scientific practices that
330 produce conclusive and consistent results? I will focus on American Psychology Association that
331 has long been the most vocal and impactful organization in psychology knowledge assessment.

332

333

334

335 **8. APA and Knowledge Assessment with Planned Adaptation**

336 APA acts as a guiding body in the knowledge assessment for psychological aspects of
337 policies. APA is the umbrella psychology organization in the US that aims to “to advance the
338 creation, communication and application of psychological knowledge to benefit society and
339 improve people's lives” (About APA, 2017). APA leads various efforts to promote best practices
340 in psychology, review the literature to make conclusions on psychology, and channelize the
341 scientific knowledge into practice through its policy statements, resolutions and government
342 relations.

343 APA assesses the scientific knowledge for the psychologists by issuing guidelines
344 prepared by using a planned adaptive framework. APA reviews and approves guidelines in areas
345 of professional conduct such as treatment of homosexual clients, children, and autistic clients.
346 The guidelines are prepared to educate psychologists in existing or new practice areas and also
347 outline best practices. The guidelines review the literature or the relevant APA task forces,
348 summarize the key concepts and provide the state-of-the-art best practices drawn from the
349 literature. Rather than a checklist of “do’s and don’ts”, the guidelines describe how practitioners
350 should approach to their clients in cases of medical certainty and uncertainty. The rationale
351 behind the recommendations is explained based on extensive literature review. The reports
352 expire with time or with major advances in the field and revisions and reviews are conducted
353 (APA Guidelines, 2016). APA has issued dozens of guidelines so far. This guideline system is
354 very similar to the guideline system for cardiac surgeries that follows a planned adaptive
355 framework for knowledge assessment (McCray, 2016). Both APA and cardiac surgery guidelines
356 are meant to be revised and improved over time, i.e. they are adaptive to learning and planned
357 ahead.

358 Moreover, APA forms policy opinions through its task forces that make extensive review
359 and knowledge assessment on various socio-political issues from a psychological perspective.
360 The task force topics include education, media, family and children, and sexual orientation. Task
361 forces review the whole literature on the topic, methodologically study the findings, make
362 conclusions and point to the gaps in the research. The task force reports conclude with a set of
363 resolutions or recommendations. The reports state APA’s standpoint on the issue, sets goals on
364 the issue for further development, and points to what areas of research to further focus on, and

365 what the groups and people affected by the findings should do. The reports also include specific
366 policy recommendations for the government or organizations. Just like the guidelines, the report
367 is revised if the topic stays relevant as an important social issue and the existing report becomes
368 outdated over time (Task Force Reports, 2016).

369 The “Sexualization of Girls” report is a good example of what task forces work on. The
370 task force consists of 7 expert members from APA. The report starts by stating that the task force
371 was formed to address public concerns on the issue. It covers the theory and findings on the
372 topic, proving the sexualization in our societies and its consequences for girls. Then, it describes
373 further research on the topic, including that most research so far has been conducted on women,
374 but not on girls. The report outlines what practitioners can do and what should be done for
375 education, training and increasing public awareness. On the policy side, the task force
376 recommends the APA to advocate for funding for research it outlines, advocate for educational
377 programs, and work with federal agencies, industry and Congress to reduce sexualization of girls
378 (APA Task Force on Sexualization of Girls, 2016).

379 Through task forces, APA updates its policies in a planned adaptive manner. While task
380 forces do not regularly research a topic, they aim to revise APA’s existing goals and efforts for
381 the subject matter as the need arises or time passes. For example, APA has published four reports
382 since 2004 on sexual orientation and homosexuality. Task force on “Appropriate Therapeutic
383 Responses to Sexual Orientation” in 2007 reviewed the 1998 report, and similarly other reports
384 built on previous reports.

385 APA’s knowledge assessments are meant to be of the highest credibility, voicing the
386 authoritative scientific opinion on the issues APA investigates. APA has established a strong
387 organizational structure for its guidelines, task forces and other efforts to ensure that the opinions
388 it presents are relevant, up-to-date and expert opinions. However, APA is more than a purely
389 scientific community with high involvement in policy-making and with ties to the US
390 government and federal agencies. A task force formed by an APA executive with a political
391 agenda may as well merely voice one aspect of the reality on a divisive scientific issue. The high
392 controllability in APA in deciding which part of the opinions among thousands of APA members
393 is to be presented raises concerns about credibility, too.

394

395 **9. APA's Impact on Social Policies**

396 APA lobbies its opinions through The Public Policy Office and other government
397 relations offices. It sends member psychologists to Washington for policy fellowships that make
398 to positions of influence in government, including the legislative director for Senator Jeff
399 Bingaman, and president of National Research Center for Women and Families. So far, more
400 than 10 APA members made their way to The House of Representatives (Maton, 2006).

401 However, aside from the guidelines used by the psychologists in their practices, it is hard
402 to measure how effective APA's efforts have been in driving change on the issues it addresses.
403 In the policy-making arena, the impact of the reports and advocacy efforts is long-term and
404 indirect. It is usually not clear how much of the policy-makers' decisions are based on
405 psychology research or APA's studies, and how the policy decisions would be different without
406 the psychology research conclusions in hand. APA's opinions penetrate through the federal
407 offices, but it is hard to know which decisions are heavily influenced by the APA's opinions
408 without statements by policy-makers that attest the psychology research's impact on the issue.
409 One concrete example is the CIA's secret collaboration with APA to create an ethics policy for
410 its tortures as part of its post-Sept. 11 war on terror interrogation program. I could not find other
411 evidences that point to APA's direct contribution to federal policy decisions, while I
412 acknowledge that more research may reveal other concrete examples. Despite the lack of
413 concrete and direct APA contributions, indirect effects such as creating public awareness,
414 changing public perception should not be underestimated.

415 Psychology research is increasingly becoming more effective on the legal cases regarding
416 public policies. APA sends amicus briefs to Supreme Court cases presenting scientific research
417 and knowledge assessment on the issues in hand and can in some cases influence the court
418 opinion. *City of Akron v. Akron Center for Reproductive Health* struck down various restrictions
419 on abortion. APA's brief on who can provide abortion counseling was the single piece of
420 scientific evidence that supported the Court's decision. Supreme Court cited several identical
421 resources and alternative regulation suggestions that APA presented. In this case, APA's opinion
422 very likely had a direct impact on the decision. In *Oregon v. Miller* case that discussed the
423 patient-psychotherapist confidentiality privileges, Supreme Court based its decision on APA's
424 arguments and upheld the interpretation of privilege that APA promoted (Tremper, 1987). There

425 are also cases where APA's briefs with psychology knowledge assessment were less effective.
426 Lockhart v. McCree at Supreme Court discussed how the jury's pre-supposed opinions on death
427 penalty could violate the neutrality of the court, the APA brief presenting sound research over 30
428 years was cited heavily by defendants of "death qualified" jurors who don't have religious or
429 ethical convictions about the capital punishment. The research may have had convincing
430 arguments for the defendants of the case, but the majority opinion was not swayed by the
431 research. In the Bowers v. Hardwick case on if sodomy can be criminalized, APA contributed
432 with an amicus brief including a breadth of research supporting that sodomy does not incur any
433 psychological problems. The evidence was weighed low against morality and history and the
434 court upheld that Georgia could criminalize homosexual sodomy. (Bersoff, 1987). We can
435 conclude that APA has had direct as well as indirect impact on policies through regulative and
436 legislative structures.

437

438 **10. What Should Be APA's Role In Video Game Violence?**

439 APA has long played the pioneering role in knowledge assessment for psychological
440 aspects of policy-making and legislation. It has the resources to work closely with the
441 government on the video game violence issue especially in addressing the long-term effects of
442 video games. It has the expertise and the organizational culture to make knowledge assessment
443 through psychology research. APA should collaborate with the FTC to conduct comprehensive
444 knowledge assessment on the relation between the video games and violence. This collaboration
445 should follow a planned adaptive framework for knowledge assessment. While APA is managing
446 the knowledge assessment process and improving its knowledge assessment procedure based on
447 new research outcomes, the FTC should be evaluating APA's procedure and recommending
448 revisions. This knowledge assessment framework should cover 3 areas: problem assessment,
449 funding, and data collection.

450 First, following a planned adaptive approach, FTC should assess what research problems
451 should be pursued for resolving practical policy and legal questions and advise APA on that.
452 APA should set internal policies for researching a specific aspect of the knowledge assessment
453 problem that would most effectively contribute to the society. These policies can include
454 advocacy and grant collaborations for conducting research on the specific problem. Currently,

455 when Supreme Court or federal agencies are seeking scientific expertise, APA experts review the
456 existing literature and prepare a report, but they do not conduct research to address the problem.
457 The incentives for the knowledge generation by academia and use of this knowledge by different
458 bodies are mostly misaligned and independent from each other. Since proving causality on even
459 a single issue requires thorough and meticulous psychological studies, research done without
460 considering concrete public benefits beforehand sometimes fail to establish the desired
461 knowledge assessment. Assessment for violent media is a clear example of this problem. Due to
462 variance across measures and methodological problems, the research cannot form strong
463 evidence for the knowledge assessment. If the research community years ago set a goal to
464 collaborate on various aspects of properly understanding the effects of violent media, a more
465 coherent set of studies could have existed. To address this problem, researchers should be
466 incentivized by APA to produce knowledge that can collectively establish proper knowledge
467 assessment for relating media and violence. In this way, psychology research will be directed by
468 APA to address issues that FTC determines to be relevant for policy-making. FTC should
469 regularly evaluate the current scientific discourse on the problem area and make
470 recommendations to APA if there is a misalignment between the scientific discourse and public
471 needs.

472 Second, APA should assess the amount and potential use of funds for conducting
473 research on the problem area determined. APA should regularly evaluate the distribution of
474 funds among various areas of research concerning the problem area to find out what research is
475 underfunded. FTC should evaluate this process, and advocate to NSF and other federal agencies
476 for providing funding to psychology research.

477 Third, APA should develop better methods for data collection, data sharing and
478 collaboration with the FTC's assistance. When a transparent and systematic collaboration is not
479 established, the studies around the same topic may not conform to a consistent framework.
480 Conventional lab experiments, field studies and longitudinal studies pose various challenges that
481 slow down the experiments, and practically limit the number of participants. Most of the
482 psychology lab experiments cannot be scaled or conducted on various independent and
483 dependent variables with larger sample sizes without increasing the organizational burden of the
484 experiments. A data initiative should aim at collecting anonymized data of video game users in
485 collaboration with game developers with consumers' full consent on shared data content and

486 shared parties. This would give researchers access to millions of data points collected from
487 natural experiment-like environments for finding patterns. This data initiative should expand on
488 APA's recent initiative for open access to research data of papers. The FTC can come up with
489 policy ideas to voluntarily encourage game developers to engineer consumer data access points
490 within the games. These policy ideas can be voluntarily enforced through ESRB.

491

492 **11. Conclusion for Video Games Regulation and Knowledge Assessment**

493 Mitigating the adverse effects of video games require proper knowledge assessment and
494 regulation. The ESRB in cooperation with the FTC has been successfully regulating the video
495 game content ratings with planned adaptation, where ESRB is enforcing and revising the
496 regulations based on FTC's evaluations on the effectivity of the regulations. On the other hand,
497 APA, as the credible authority for providing knowledge assessment for various policy issues,
498 should direct the scientific research for better assessing video games' adverse effects. APA and
499 FTC should implement an adaptive knowledge assessment process.

500 While concluding the analysis on video games regulation, we move on to virtual reality, a
501 new medium for media and video games, with potentially much more powerful social and
502 psychological consequences.

503

504 **12. Virtual Reality and The Future**

505 Virtual Reality will open doors for unprecedented possibilities. VR will open a window
506 to a real-like interactive experience in any lab and educational environment with anyone around
507 the world. Students in Malaysia will be able have a virtual lecture in an archeological field in
508 Mozambique investigating the stones there, and switch to a field trip to CERN the next lecture.
509 In virtual worlds, players will create their dream lives, with the virtual characters of their dreams,
510 and they will live, work, get married, make virtual money and trade goods. Arguably, some will
511 like the infinite possibilities of virtual life more than the constraints of real life, and they will
512 want to just be part of the virtual life. On the extreme, virtual worlds will open a new world with
513 little to no accountability, where players can act out the most violent things without hurting
514 anyone.

515 However, the success of these developments will depend on understanding how humans
516 perceive, interact with and be influenced by the virtual worlds and how we utilize the technology
517 for maximizing social benefits and minimizing adverse outcomes.

518

519 **13. Video Games and Virtual Reality**

520 Virtual reality devices have already entered to mainstream consumer market in 2016 with
521 Oculus Rift and HTC Vive. While many more VR applications in areas ranging from education
522 to tourism are expected, the current major use case of the virtual reality technology is and will be
523 gaming that will involve virtual worlds. At the moment, at least half of the VR applications are
524 games, and the most time-consuming use case of the technology is gaming (Cnet, 2016). Virtual
525 reality has enabled video games to become more immersive in different ways. In comparison to
526 traditional video games that are projected on 2D screen and played with a basic game control
527 mechanism like game consoles or keyboards, VR games immerse users to a 3D environment
528 where players can interact with the environment and each other using a VR console or body
529 movements. Aside from the differences in some of the game dynamics of VR and video games,
530 existing VR games are mostly continuations of the existing video games or they are based on the
531 same technological principles with similar content.

532 Due to this close proximity, VR games are currently regulated with the frameworks used
533 for the video games. I will extend the discussions and considerations made for video games to
534 VR and base the regulatory solutions regarding VR on these discussions. However, VR requires
535 special attention and reconsideration of the existing frameworks, because VR devices introduce a
536 new type of immersive experience, beyond the experience from a game console. VR games
537 manipulate the players' psychology at least as much, and probably more than games. Virtual
538 environments immerse the user into games in much stronger ways than video games. They
539 strongly signal to the brain the perception that the game is actually real, as I discussed below in
540 detail, and they enable players with body motions to be more active agents in enacting the
541 violence. The potential adverse effects of video games carry to VR games and require more
542 careful attention since the virtual environments are more powerful in influencing human
543 psychology. A review of the psychological effects of VR will highlight this feature of the
544 technology.

545

546

547 **14. Psychological Effects of Virtual Reality Environments**

548 Potential short-term psychological effects of VR are concerning to a level that they
549 require regulatory attention. Since virtual worlds enable players to act and interact freely with
550 other virtual players, some violent and abusing actions that are not programmed to be possible in
551 video games are left possible in virtual worlds. Strongly negative acts may induce strong traumas
552 especially if the consumers start perceiving the virtual worlds near to real. Jordan Belamire's
553 experience in a multiplayer virtual world names QuiVR marked one of the first serious
554 incidences of abuse in virtual worlds. Another player abused her by groping her with his hands
555 While she had a virtual experience that didn't involve any real interaction, she recounts that "The
556 virtual groping feels just as real" (Belamire, 2016). Once she started perceiving the world as
557 "real", her VR experience had strong effects on her psychology. Similarly, an explicitly violent
558 and unexpected scene may be traumatic for someone who starts perceiving the virtual
559 environment as real. Research supports the premise that humans may perceive VR as real. When
560 participants next to the edge of a deep pit in the virtual world are asked to lean over the edge of
561 the pit to put an object on the ground, the subjects show increased stress, even though they know
562 that the pit is just virtual. When the participants are asked to walk over a beam over a virtual pit,
563 they again show increased stress and fear (Meehan, 2012). These effects are certainly not present
564 in video games, and calls for more careful consideration of adverse effects and content regulation
565 policies for VR games. To mitigate these risks, content rating policies and informative
566 descriptions should be used. How these policies can be put into action will be discussed in the
567 next section.

568 The long term psychological effects of immersive virtual environments on human mind
569 and behavior are grounded on three concepts of modern psychology. First, brain plasticity
570 suggests that brain is able to learn attitudes and behaviors drastically different than its existing
571 attitudes and behaviors in any age (Rakic, 2002). Second, the context-sensitivity shows that
572 human behavior is easily manipulatable depending on the environment. Our behaviors and
573 attitudes can change in the context of immersive virtual environments when we embody different
574 self-representations, a phenomenon termed as "Proteus Effect" by Jeremy Bailenson from
575 Stanford VHIL. In his study, attractive avatars, the characters used by the participants in the
576 virtual environments, approached strangers more quickly and demonstrated increased self-

577 disclosure and more intimate interactions compared to the behaviors of less attractive avatars.
578 Taller avatars negotiated more confidently by showing willingness to split negotiation tasks
579 unfairly compared to shorter avatars (Bailenson, 2007). Third, the brain is able to perceive
580 virtual worlds as real. For instance, VR environments, individuals can start associating their self
581 and body with virtual identities and bodies, and start feeling strokes on a virtual hand located
582 virtually in the real arm's position without the real hand being stroked (Ehrsson, 2005). In the
583 light of these concepts, we can easily perceive virtual worlds as a different, real context;
584 demonstrate different attitudes and behaviors depending on the context, and our brains may start
585 adapting these attitudes and behaviors outside of that context.

586 Research indicates that the real-life effects of virtual experiences can be negative. The
587 Proteus effect can invoke negative attitudes and behaviors. In a study of self-objectification and
588 sexualized representation, participant women were randomly assigned to sexualized and not
589 sexualized avatars. They observed themselves in mirror in a virtual environment and had
590 interactions with other virtual users. Women with sexualized appearances reported more body-
591 related thoughts than women with neutered appearances. As the research concludes, “women
592 who wear sexualized avatars may internalize the features of their avatars and start perceiving
593 themselves in a sexually objectified manner” in real life (Bailenson, 2013). Modern psychology
594 shows that self-objectification can lead to depression, aggression, acceptance of violence against
595 women and decreased cognitive performance. Moreover, interactions with sexualized characters
596 in video games lead men to be more inclined to harass women and lead women to show lower
597 self-efficacy. In an immersive virtual environment, these effects can be magnified (Bailenson,
598 2013). The self-objectification study is a concrete example of a psychological mechanism that
599 roughly explains how virtual experiences can change social attitudes over years and decades.

600 Over time, the virtual engagement might be dominated by addictive and attractive virtual
601 worlds with highly violent, abusive and sexually explicit content driven by the financial interest
602 of private companies. The violence attitudes, race and gender biases, deceptive practices in
603 virtual environments might unconsciously manipulate our real life through the mechanism
604 explained above. In the further future, if virtual reality becomes too real and prevalent in our
605 lives, our virtual identities built on problematic foundations and ethical principles may become a
606 major driving part of our lives. While these claims may sound too stretched, they deserve
607 research attention.

608 On the other hand, critics of claims on VR's psychological effects argue that individuals
609 might be experiencing heightened effects, since the experience is fairly new. When people first
610 watched motion picture in early 20th century, some were frightened and uncomfortable. The
611 critics also point to contradictory research on video games' effects and claim that current VR
612 research similarly cannot be trusted (Marshall, 2016).

613 Aside from the mentioned potential adverse effects, virtual environments can possibly be
614 designed to increase positive attitudes in the society, create novel educational opportunities and
615 foster empathy, confidence, collaboration, multicultural understanding, social well-being,
616 connectedness and happiness. As a matter of fact, it is too early to make conclusive statements
617 about how human attitudes and behavior will be affected by VR. The current body of research
618 and practice is just too preliminary. Knowledge assessment for long-term cumulative effects of
619 VR and assessment for how VR can be used for education and therapy should be accomplished.
620 The knowledge assessment for psychology of VR and its implications will be further discussed.

621

622

623 **15. Virtual Reality Content Regulation**

624 As discussed in the previous section, within virtual environments, user behavior and
625 psychology may be more strongly affected by the environment, since users engage with a more
626 immersive, 3D environment, and use body motions. Exposure to inappropriate VR content may
627 even cause traumas or other strong negative effects on the customers. The FTC and the ESRB
628 should at least have the same protective incentives they have for the video games case to regulate
629 VR.

630 Similar to the video game case, short-term risks of virtual reality, most importantly
631 games and virtual worlds content, can be addressed by properly informing consumers about what
632 content may be appropriate for them. The ESRB and the FTC collaboration is a successful
633 example of enforcing self-regulatory standards that are revised and improved with changes in the
634 technology and new information. Virtual reality content should be rated by the ESRB with the
635 oversight of the FTC, in the same way the FTC made recommendations with the emergence of
636 game content in new environments like internet and mobile apps in its earlier reports.

637 As of December 2016, the FTC has not made any comment or showed interest in
638 investigating the best practices for entertainment in VR. Because the technology is new,

639 interpreting VR games' content based on their impact on the users is still an open-ended
640 question. So far, the ESRB has rated VR games solely based on the explicitness of the content,
641 seemingly disregarding how the users experience the virtual immersion and body interactions.
642 For instance, should knifing in a game using keyboard buttons be considered at the same
643 violence level as knifing using hands in VR as in real life? VR experiences require revision of
644 the ratings and may require addition of further descriptions to best inform consumers.

645 The ESRB and the PEGI, the EU version of the ESRB, seem to be keeping with the VR
646 trends and considering revisions as the VR market expands. The PEGI director Dirk Bosmans
647 stated that the rating criteria involving horror and fear might be revised (Calvin, 2015). An
648 ESRB representative commented that the current the ESRB ratings for the existing VR games are
649 sufficient, but the ESRB will be tracking the developments in VR games to make rating revisions
650 as necessary (Jagneaux, 2016). The initial reactions of the organizations show promise for
651 adaptive learning. However, FTC in the US and NICAM in the EU should follow-up with and
652 evaluate the new rating standards to increase the credibility of the knowledge assessment for VR
653 games' impacts.

654 In fact, rating titles describing the intensity of the games may as well be useful for adult
655 users. The review of the research in the previous section on immersive virtual environments
656 suggests that brain can perceive the virtual environment as real and a traumatic event in VR may
657 be able to perturb the consumers as much as it would perturb in real life. Since the potential
658 effects are much stronger, the game ratings describing the intensity and other elements of the
659 games would be useful for all of the users. Ideally, these ratings should be based on sound
660 scientific evidence. Knowledge assessment should be done to investigate the effectiveness of the
661 ratings as well as longer-term effects of VR.

662

663 **16. Knowledge Assessment for Virtual Reality**

664 The most important step towards better virtual reality in the long run is to bridge the
665 scientific knowledge gap on the potential beneficial and adverse effects of virtual reality and how
666 these effects can be realized. As long as the clouds of uncertainties around virtual reality and its
667 effects exist, a healthy knowledge assessment for public good is impossible. Without proper
668 knowledge assessment, the laissez faire approach towards the development and use of various
669 virtual reality technologies will continue to pose potential long-term risks. Moreover, in the

670 absence of sound exploration of various aspects of VR, neither the public awareness on virtual
671 reality will be created nor the potential beneficial use cases of the technology especially in
672 education will become reality.

673 Video games case is a good example on what can go wrong with the knowledge
674 assessment as well as what practices should be applied for the VR case. The discussion in section
675 6 suggests that the knowledge assessment on adverse effects of video games have failed. This is
676 mainly due to the lack of research standards and research direction. If proper steps are not taken,
677 research on VR's impact on the society will fail in a similar fashion. A valid knowledge
678 assessment can be conducted with a similar framework described in section 10. For better
679 knowledge assessment, better problem assessment, funding and data collection processes should
680 be developed. APA should work with the FTC to put the framework into action. The difference
681 between the video games and virtual reality cases is the existing scientific ecosystem and
682 government awareness on the two technologies. While video games have a long history of
683 research and policy discussions, there is little research done on VR and no serious policy or legal
684 debates. It is not clear how differently the public will perceive VR over time and if Supreme
685 Court rulings and some existing regulations for video games will apply to VR. This uncertainty
686 with the technology and the technology's social implications emphasize again the importance of
687 adaptive learning in establishing better knowledge assessment, as described in section 10.

688

689 **17. Conclusion**

690 Video games have long been part of our lives. Virtual reality is about to revolutionize the
691 way we think of education, social interactions and gaming. Yet, new technologies come with the
692 cost of disrupting our existing practices and bringing changes to our lives that can have positive
693 and negative externalities. This analysis of the psychological effects of video games and VR and
694 how to better assess the adverse effects and put necessary regulatory practices in action has
695 presented several existing successful and potential applications of planned adaptation for better
696 public policy.

697 The ESRB and the FTC have already been regulating the video games in a planned
698 adaptive manner. However, the FTC has been failing to fulfill its responsibility of evaluating
699 video games regulations in the last 5 years, and this failure has demonstrated itself on the

700 effectiveness of the ESRB in regulating recent media technologies. VR regulation should learn
701 lessons from the video game case and its regulation should be based on the same framework as
702 the regulatory framework for video games. APA has shown success and failure in advocating
703 scientific knowledge for policy-making, particularly due to lack of external accountability. A
704 planned adaptive collaboration between the FTC and APA will prove successful in directing
705 scientific research for understanding the psychological aspects of VR for public policy.

706

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