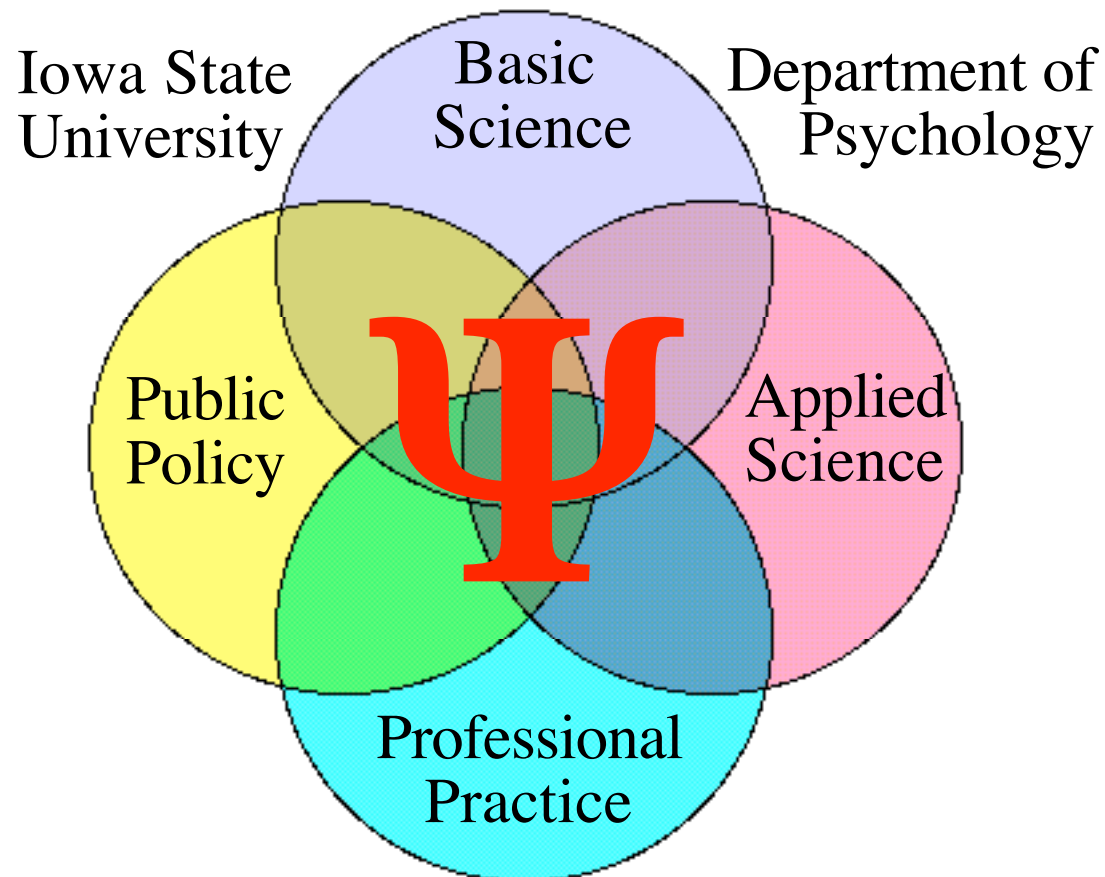


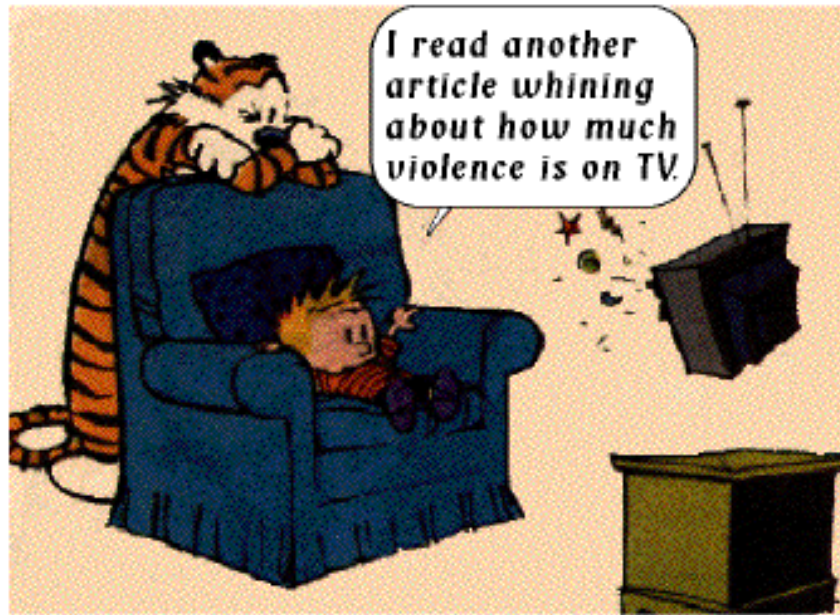
# Video Game Effects on Children & Adolescents

Craig A. Anderson, Distinguished Professor  
Director, Center for the Study of Violence



University of Western Ontario, October 21, 2011

# Calvin & Hobbes on Media Violence



# For Good or Ill

- Video games are great teaching tools
- What they teach depends on the content
- Nonviolent games: exciting, fun, appropriate
- Some educational; others mainly entertainment
  - Standard “school” content
  - Helping kids learn to manage diabetes & asthma (Lieberman), ADHD (NASA), cancer...
  - Flying simulators.

# Presentation Outline

- Media Violence Effects–Overview
- Video Game Violence Effects: 5 key questions
- Size of Media Violence Effects
- Other Dangers
- What works? Conclusions
- Daily Show/U.S. Supreme Court.

# Media Violence Effects

- Research evidence was clear by 1975
  - Debate still rages in some countries
- Hundreds of studies
- Numerous meta-analyses (statistical averaging)
- 2 main results:
  - 1. Short term exposure ↑ aggression immediately
  - 2. Long term exposure ↑ aggression into adulthood.

# Media Violence Background

- Definitions
  - Aggression: Behavior intended to harm
  - Violence: Severe forms of aggression
  - Media violence: Media portrayals of intentionally harmful behavior directed at
    - real or imaginary characters
    - human or nonhuman.

# First Person Shooter: Soldier of Fortune



[2010clips](#)



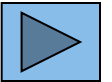
# Third Person Shooter: Otto Matic





# The Causality Conundrum, Part 1

- Scientific “causality” is probabilistic, not “necessary & sufficient”
  - Smoking causes lung cancer
  - Not all who smoke get cancer
    - Violates sufficient causality
  - Some nonsmokers get lung cancer
    - Violates necessary causality
- Most people understand this for medical issues
- Many apply the old “necessary & sufficient” criteria when they don’t like the specific case
  - e.g., Smokers & the tobacco industry on smoking issues
  - Gamers & the video game industry on video game issues.



# Media Violence Research Methods

- Triangulation
  - Multiple research methods
  - Different strengths & weaknesses
  - Look for consistency or inconsistency
  - Test plausible alternative explanations
- 3 main research designs.

# 3 Pillars of Causality

Also known as: 3 Types of Studies

	Experimental	Cross-Sectional	Longitudinal
Advantages	Causality	Type of Aggression	Causality Type of Aggression
Disadvantages	Type of Aggression	Causality	Expensive Time Frame

# Causality and the 3 Pillars

- Key goal of research:
  - Test alternatives to a causal hypothesis
- The fewer plausible alternatives that remain, the greater confidence one can have in affirming the hypothesis
- Experimental studies most powerful
  - Random assignment reduces likelihood of confounds with **any** alternative causal variable
- Longitudinal studies also powerful
  - Controlling for T1 aggression also controls for alternative causes
- Cross-sectional weakest, because of potential confounds
  - But, they provide opportunity for disconfirmation
  - Also, can test specific causal alternatives.



# Five Key Questions about Violent Video Games

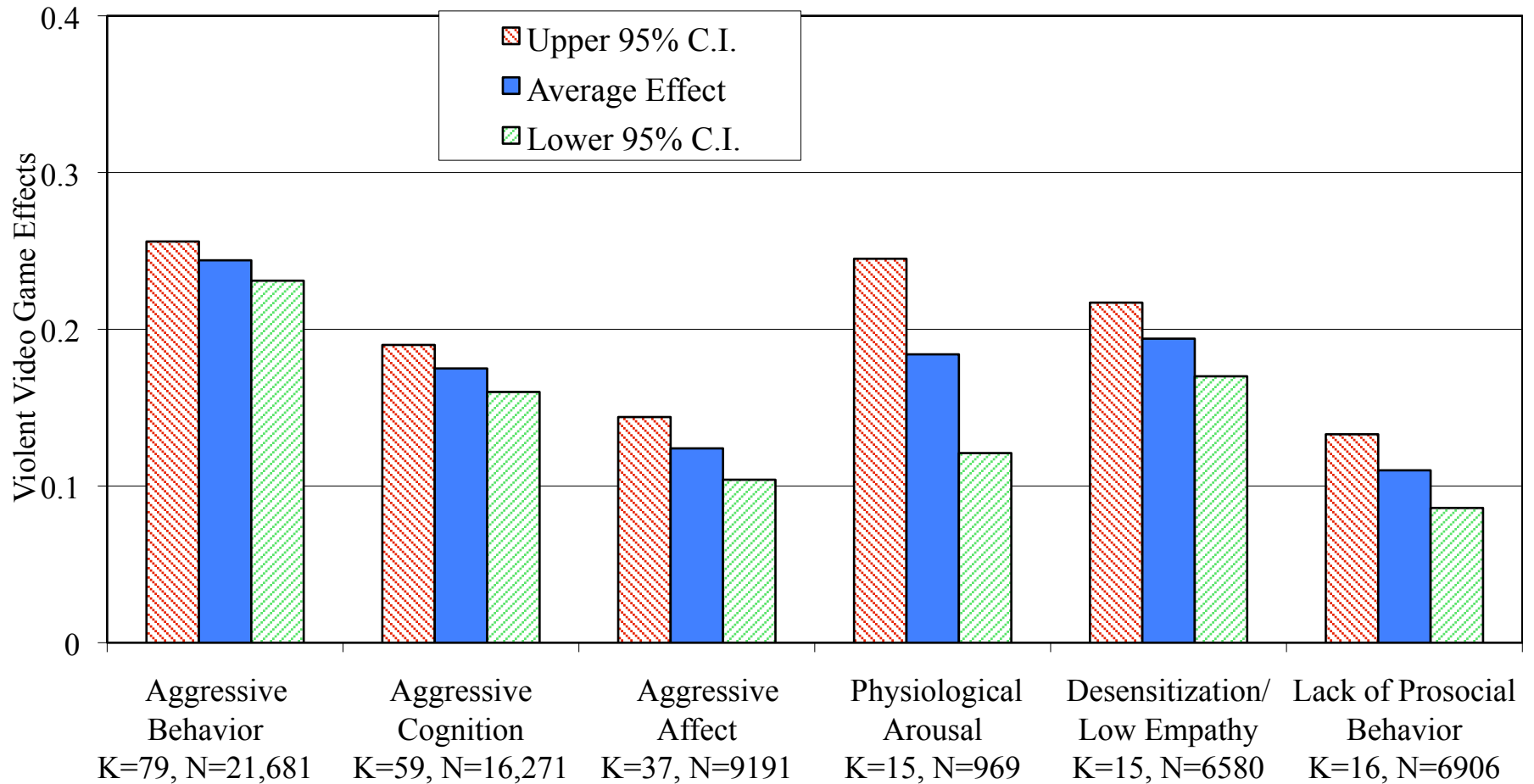
- Is the research evidence consistent?
  - **Yes**
- Do poor methods yield over-estimates of negative effects?
  - **No**
- Is there *causal* evidence?
  - **Yes**
- Is there evidence of effects on seriously aggressive behavior?
  - **Yes**
- Is there good theory?
  - **Yes.**

# Video Game Meta-analysis: Overall

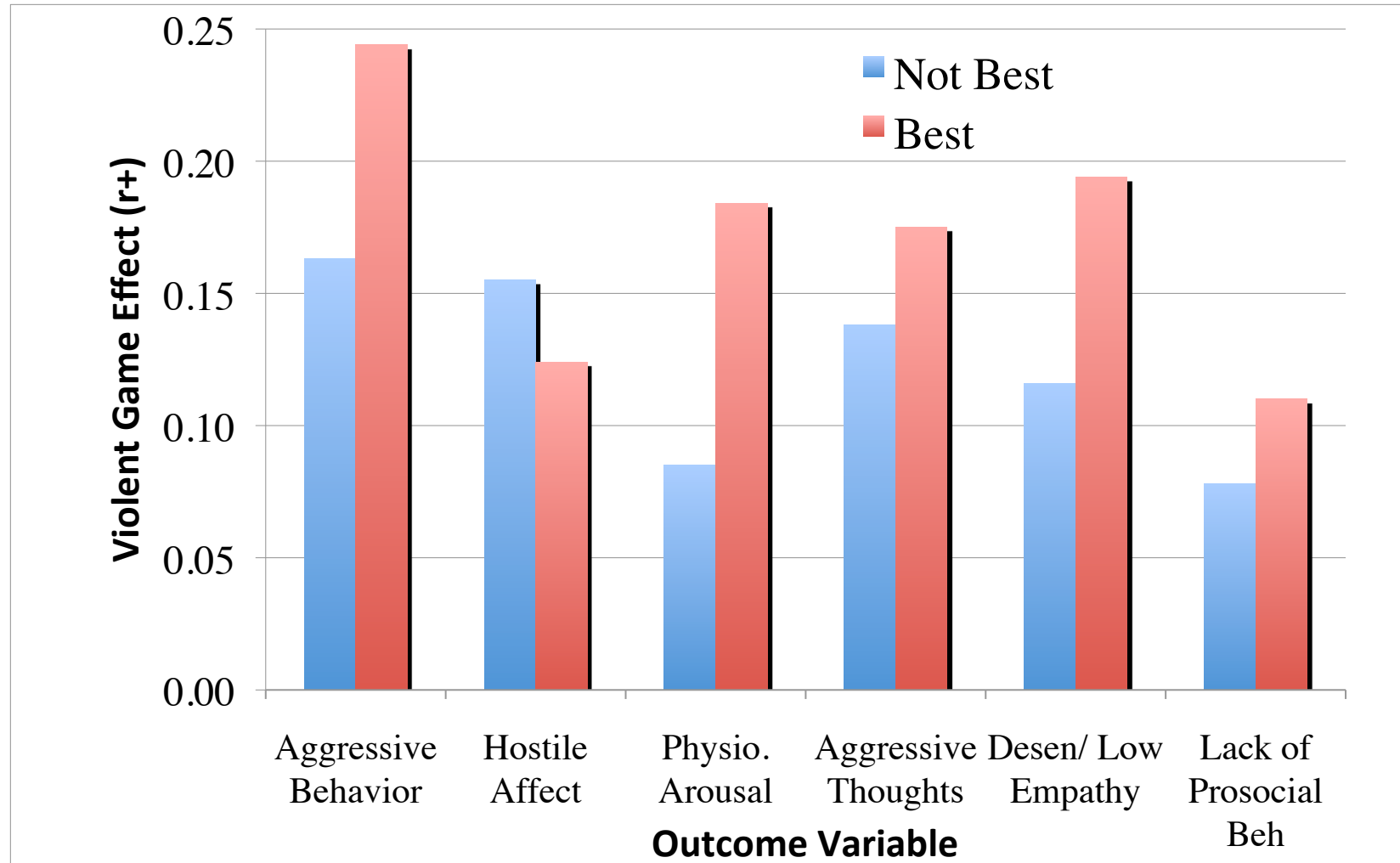
- Meta-analysis: A study of studies
  - Statistical method used to combine the results of multiple studies of the same hypothesis
  - Yields an average effect size
  - Can test whether the average is significantly different from zero
- Effect size measure:  $r^+$ 
  - Ranges from -1.0 to +1.0
  - -1.0 = perfect negative relationship
  - 0.0 = no relationship
  - +1.0 = perfect positive relationship.



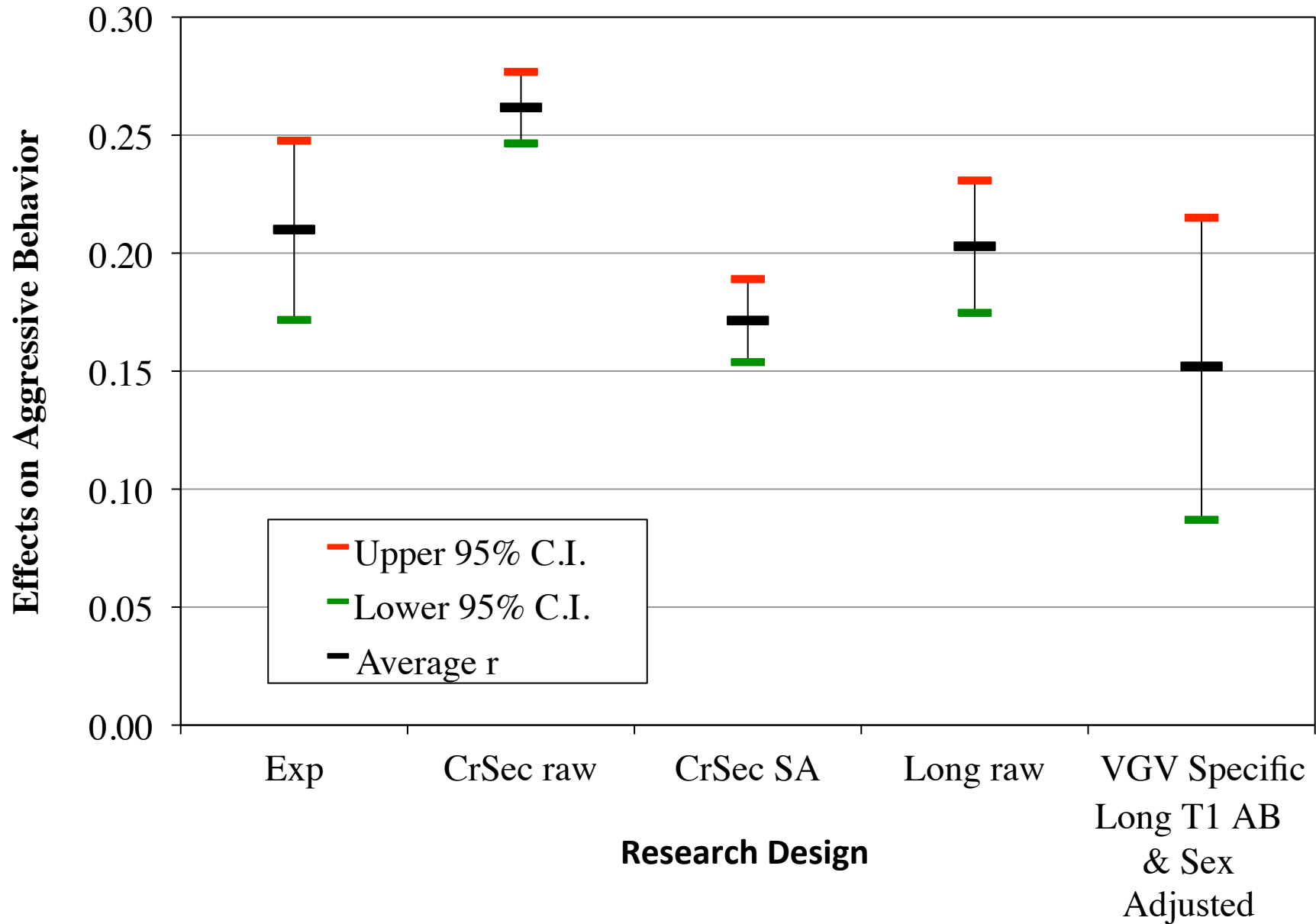
# Video Game Meta-analysis: Overall



# Meta-analysis of Video Game Research Quality



# Video Game Meta-analysis: Aggressive Behavior

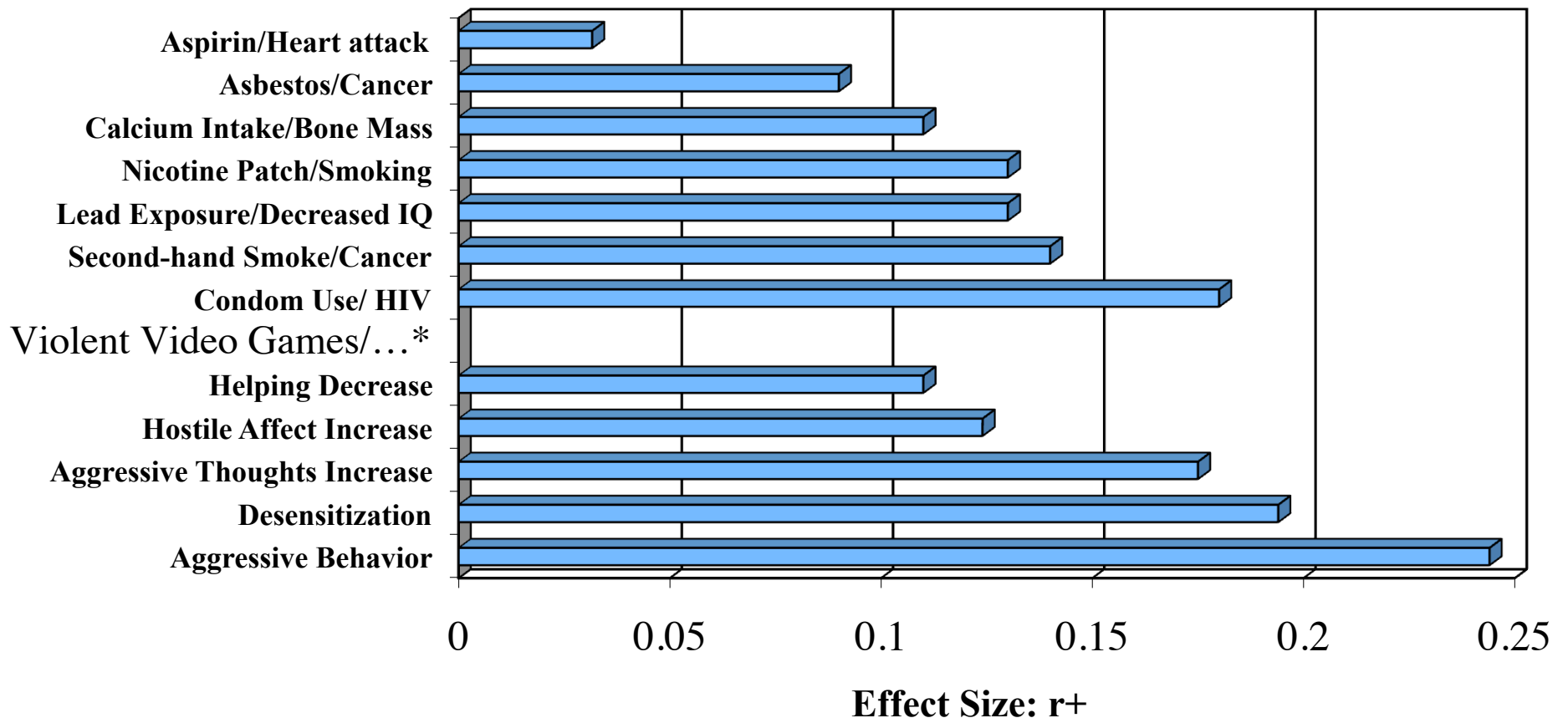


# Aggressive Behavior in Video Game Studies

- Punishment level for opponent
- Hitting, kicking, punching, biting...
- Fights at school
- Physical assault (teachers, peers, parents)
- Robbery
- Verbal aggression
- Teacher ratings
- Peer ratings
- Parent ratings.

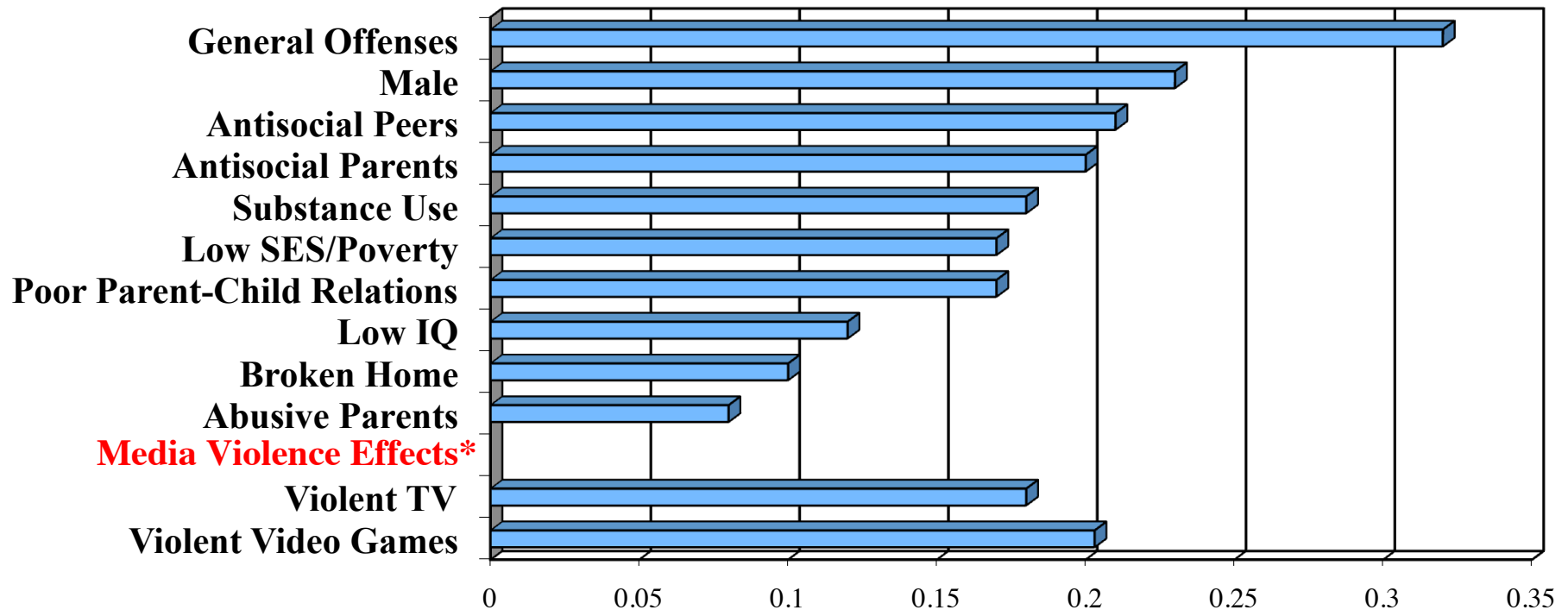


# How “big” are the video game effects?



\*From Best practices studies, Anderson et al., *Psychological Bulletin*, 2010

# Some Longitudinal Risk Factors for Youth Violence

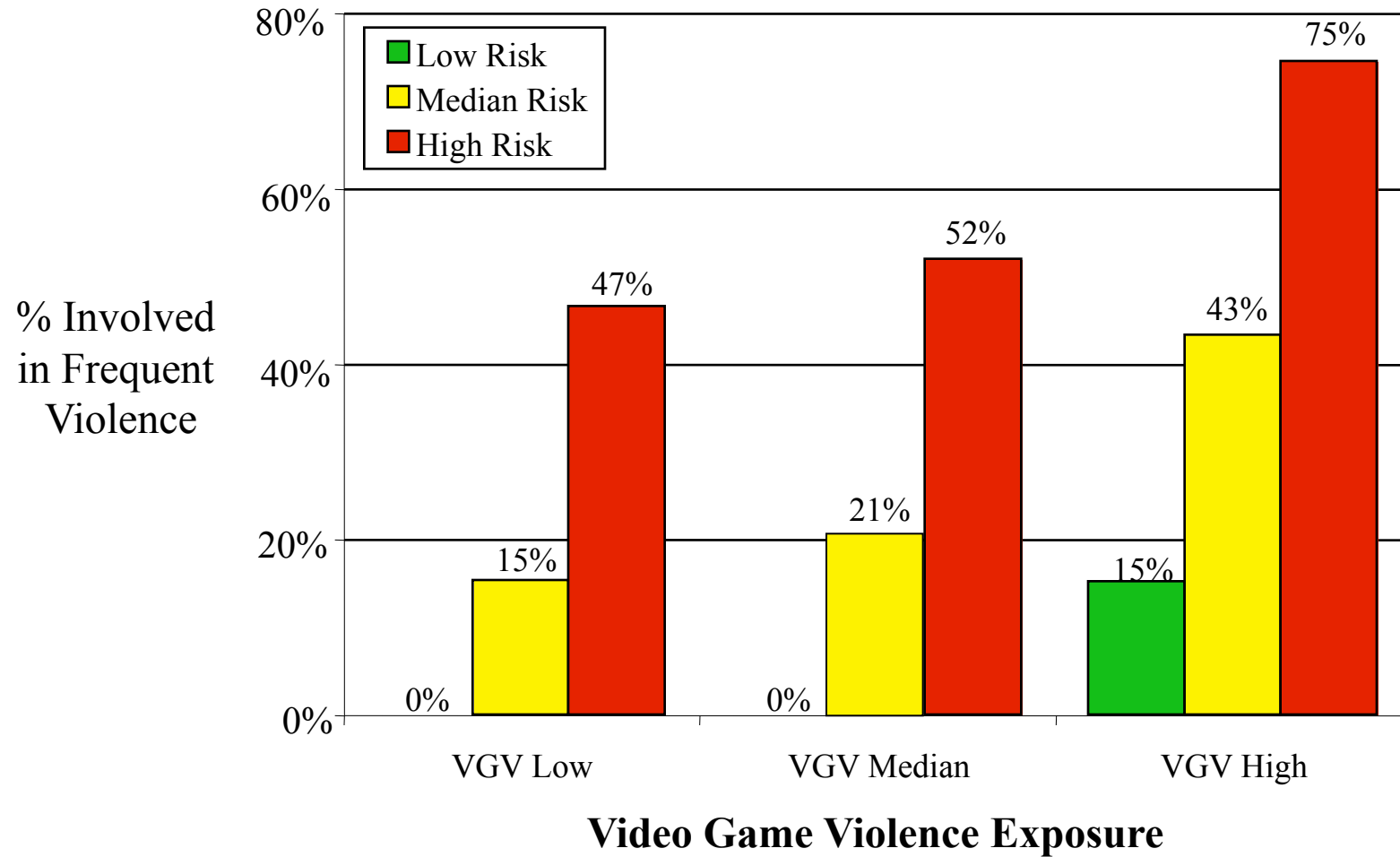


Adapted from U.S. Department of Health and Human Services (2001). *Youth violence: A report of the Surgeon General*. Rockville, MD: U.S. Government Printing Office. \* TV estimate from Bushman & Huesmann, 2006, *Archives of Pediatric & Adolescent Medicine*, 160, 348-352. Video games estimate from Anderson et al. (2010) *Violent Video Game Effects on Aggression in Japan and Western Countries*.

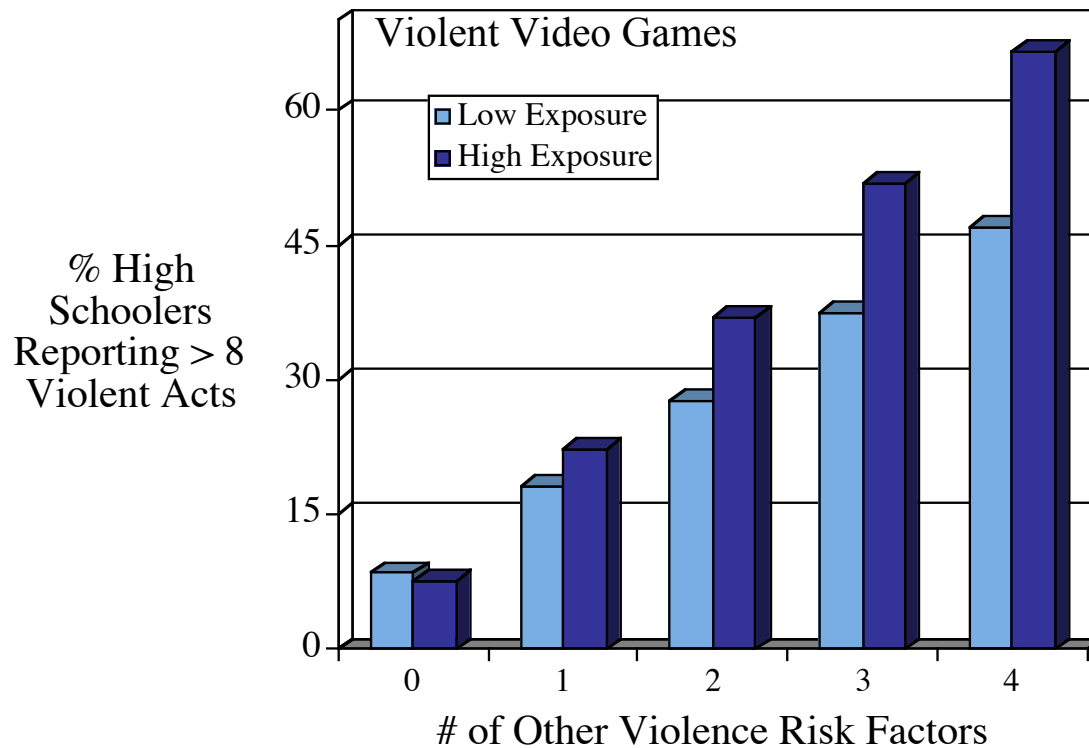




# High School Students



# Violent Behavior by High School Students



From Study 2 of Anderson, C. A., Gentile, D. A., & Buckley, K. E. (2007). *Violent Video Game Effects on Children and Adolescents: Theory, Research, and Public Policy*. Oxford University Press. Additional analysis.



# What Can We Do?

- Parents & teachers:

1. Reduce media violence at home & school
2. Counter-attitudinal interventions, at school & home
3. Parental mediation with children

- Health care professionals:

1. Discuss media violence problems with patients/clients
2. Encourage parents & school officials to take positive action
3. Make literature on media effects available in waiting rooms

- Citizens in general:

1. Discuss the problem with retailers
2. Buy from helpful retailers, boycott others
3. Let your elected officials know of your concerns and preferred solutions.

# What Can We Do?

- Public Policy Options
  1. Education (PSAs, schools, PTAs, medical settings...)
  2. Voluntary industry rating systems
  3. Mandatory industry rating systems
  4. Mandatory warning labels
  5. Governmental ratings of advisory nature
  6. Governmental ratings of regulatory nature
  7. Mandatory ratings by truly independent 3rd party
  8. Legal access restrictions
- Take home message: Public Policy Issues
  1. Scientific facts are relevant
  2. Nonscientific issues are important
  3. Governmental regulation: Necessary if education and industry self-regulation continues to fail?



# Video Games in 2010

- Super Mario Galaxy 2 castle (E)
- Lego Indiana Jones 2 lawnmower (E-10)
- UFC Undisputed 2010 (T)
- God of War III (M)



# Super Mario Galaxy 2 (E)



2010clips



# Lego Indiana Jones lawn mower (E-10)



[2010clips](#)

# UFC Undisputed 2010 (T)



[2010clips](#)

# God of War III (M)



2010clips

# Other Gaming Dangers: Attention/Executive Control

- Especially proactive executive control
  - fMRI, ERP, & Stroop Reaction Time data
  - Action gamers:
    - have difficulty maintaining proactive control over time
    - working memory maintenance is attenuated
    - these effects can be induced with 10 or fewer hours of training with a first-person shooter video game
    - brain function and Stroop RT patterns are very similar to conduct disorder adolescents
- ADD/ADHDA linked to excessive screen time
  - Self-report, Teacher report, Diagnosis, fMRI, ERP.

# Other Gaming Dangers

- Emotional information processing
  - Desensitization to violent images (Stroop, ERP, fMRI)
- Video Game Addiction
  - about 8% of gamers in the U.S. & Singapore
  - longitudinal data imply a causal effect
- Poor school performance
  - All grade levels (AGB07)
  - Weis & Cerankosky (2010) experimental data.





# Gaming & School Performance

- High gaming → poor school performance
  - All grade levels, elementary school – college
  - Multiple cross-sectional studies
- Weis & Cerankosky (2010) experiment
  - 6-9 year old boys
  - Randomly assigned to receive a PlayStation II
    - Either at beginning of study, or end (4 months)
  - Game play (min./day): PSII=39, Control=9
  - After-school academics: PSII=18, Control=32
  - Reading scores (adjusted): PSII=96, Control=102
  - Writing scores (adjusted): PSII=95, Control=101.



# Other Harmful Consequences of Excessive Screen Time

- Poorer school performance (all grade levels, AGB, 2007)
- Social isolation (Bickman & Rich, 2006)
- Obesity
- Early sexual behavior
- Early alcohol use and abuse
- Illicit drug use
- Tobacco use.



# Supreme Court Decision

