
Thank you to those who have been good to me
ENDURING RESEARCH QUESTION:

*How can we prevent children from growing up to kill each other?*

Narrative begins with a masters project:

A randomized controlled trial to reduce aggressive behavior problems in Durham school boys

Highly successful study, showing that...
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Highly successful study, showing that....

*Intervention had no impact on boys’ behavior.*

1. Convinced that Saddam Hussein had nuclear weapons, President George W. Bush starts the Iraq War by saying, “After all, this is the guy who tried to kill my dad.”

2. A 19-yr-old mother slaps her 6-week-old infant boy after he peed all over her while she changed his diaper. She says, “I just know he got mad at me for not feeding him quick enough.”

3. A 17-yr-old boy is arrested for shooting a peer. When asked why, he said, “He dissed me by the way he looked at me.”
Goals of Talk Today

1. Describe pattern of decision-making under uncertainty called *defensive processing*, its consequences, and its antecedents.

2. Apply findings to *Fast Track* intervention to prevent chronic violence by changing defensive processing in aggressive children.

3. Apply findings to *Durham Connects* program to prevent infant maltreatment by surrounding mother with support.

4. Discuss implications for interpersonal behavior, living a longer life, public policy, and beyond.
Defensive Processing Style in Response to Uncertain Provocation

*(Social information processing model)*

**Processing Step**

1. Attention to cues
2. Interpretation of cues
3. Emotional experience
4. Response generation
5. Response evaluation

**Defensive Processing**

* Hypervigilance to threat
* Hostile attributional bias
* Anxiety, anger, self-defense goal
  * Cardiac hyper-reactivity
  * Testosterone release
  * Amygdala activation
* Aggressive impulse
* Justify retaliation, revenge

* Dodge et al., 1986, SRCD Monographs; Crick & Dodge, 1991, Psychological Bulletin.*
Procedure for Assessment of Social Information Processing Patterns

“Imagine that another kid comes from behind and bumps into you....”
After a child attributes hostile intent, that child is likely to retaliate aggressively. Triple the probability of aggressive behavior.

Dodge, 1980, Child Development.
Chronically aggressive children demonstrate chronic defensive processing.
Mean Second-by-Second Heart Rate Reactivity in Response to Provocation for Aggressive and Nonaggressive Boys

Crozier, Dodge, et al., 2008, J Abnormal Psychology.
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Mean Second-by-Second Heart Rate Reactivity in Response to Provocation for Aggressive and Nonaggressive Boys

Crozier, Dodge, et al., 2008, J Abnormal Psychology.
Defensive processing of provocation leads to testosterone release in aggressive males

Neural Mechanisms in Defensive Processing

**Amygdala** is activated by:

* Threatening faces *(Pezawaz et al., 2005)*
* Perception of anger in others *(Murphy et al., 2003)*

**Prefrontal cortex** is activated:

* In planning, inhibitory control, & decision-making *(executive function; Raine et al., 1997)*
The strong relation between hostile attributional bias and aggressive problems holds worldwide. (PAC: 1400 8-year-old children in 14 cultures followed longitudinally) Dodge et al., 2015, Proceedings of the National Academy of Sciences.
Culture differences in tendency to attribute hostile intent account for culture differences in children’s aggressive behavior problem rates.

Dodge et al., 2015, Proceedings of the National Academy of Sciences.
Trying to move toward causal interpretation: Defensive processing in childhood predicts growth in aggressive behavior problems into adulthood (CDP: 585 children followed from preschool through age 25)

Age 25 Outcomes of Early Defensive Processing

(Fast Track study of 1,199 kindergarteners followed to age 25)

Violent Convictions

<table>
<thead>
<tr>
<th>Quintile Group</th>
<th>Age 25 Violent Convictions</th>
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<tbody>
<tr>
<td>Lowest</td>
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<tr>
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<td>Mid</td>
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<td>Mid-High</td>
<td>2.0</td>
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<tr>
<td>Highest</td>
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Defensive Processing Quintile Group, Age 10
Age 25 Outcomes of Early Defensive Processing

**Violent Convictions**

- Lowest
- Low-Mid
- Mid
- Mid-High
- Highest

**Drug Convictions**

- Lowest
- Low-Mid
- Mid
- Mid-High
- Highest
Age 25 Outcomes of Early Defensive Processing

Violent Convictions

Drug Convictions

Property Convictions
Age 25 Outcomes of Early Defensive Processing

**Violent Convictions**

- Lowest
- Low-Mid
- Mid
- Mid-High
- Highest

**Drug Convictions**

- Lowest
- Low-Mid
- Mid
- Mid-High
- Highest

**Property Convictions**

- Lowest
- Low-Mid
- Mid
- Mid-High
- Highest

**Antisocial Personality**

- Lowest
- Low-Mid
- Mid
- Mid-High
- Highest
Age 25 Outcomes of Early Defensive Processing

Maltreat Offspring

Lowest  Low-Mid  Mid  Mid-High  Highest
Age 25 Outcomes of Early Defensive Processing

Maltreat Offspring

- Lowest
- Low-Mid
- Mid
- Mid-High
- Highest

Partner Violence

- Lowest
- Low-Mid
- Mid
- Mid-High
- Highest
Age 25 Outcomes of Early Defensive Processing

Maltreat Offspring

Partner Violence

High School Dropout
Age 25 Outcomes of Early Defensive Processing

Maltreat Offspring

Partner Violence

High School Dropout

Depression / Anxiety
Age 25 Outcomes of Early Defensive Processing

Full-Time Employment
Age 25 Outcomes of Early Defensive Processing

Full-Time Employment

Well-Being
(Strengths, Happiness, Health)
Defensive processing predicts increased probability of mortality 30 years later (Law students followed for 30 years)

Hostile Defensive Processing in Young Adulthood

How does defensive processing develop in dyadic and group interactions?

I. Real-time observation in new relationships
II. Development across life course
Design of laboratory observation – interview study
(Previously unacquainted children brought together for 45-minute play groups for 8 consecutive days)

“Why did that boy act that way?”
1. Hostile attributional biases begin within 45 minutes.
2. They are mutual: by, and toward, aggressive children.
3. Observed aggressive acts follow attribution patterns.

Defensive processing develops within a dyadic relationship

Defensive dyadic relationships develop across time.

Aggressive children have more defensive relationships than do nonaggressive children.

Once initiated, defensive relationships become stable and unlikely to change.

Defensive processing becomes a self-fulfilling prophecy in behavior.

*Dodge, 1983, Child Development.*
Defensive processing begins in early-life relationships: Early physical maltreatment by a parent (12%) leads to defensive processing.

\[ \text{Hypervigilance} \]
\[ \text{Hostile Attributional Bias} \]
\[ \text{Aggressive Response Generation} \]

\[ \text{Not Maltreated} \]
\[ \text{Maltreated} \]

Children over-generalize: Defensive processing patterns mediate the impact of early physical maltreatment on adult violence

Defensive Processing patterns mediate the impact of early physical maltreatment on adult violence. Hostile Attributions, Aggressive Res Gen, and Response Evaluation are key factors in this mediation. Early Maltreatment (Age 0-5) influences Defensive Processing, which in turn affects Violence (Age 24) as reported in Self and Partner reports.

Social rejection by peers leads to defensive processing.

Dodge, et al., 2003, Child Development.
Defensive processing patterns mediate the impact of early peer rejection on later aggression

Defensive Processing

- Hyper-vigilance
- Hostile Attributions
- Aggressive Res Gen
- Response Evaluation

Early Peer Rejection (Grades K-3)

Child Aggression (Grade 4)

.22**

(.32**) .25**

.18**

Dodge et al., 2003, Child Development.
Laboratory experiments to alter defensive processing

Can we stop it?

What not to do:

Direct persuasion

Revengeful punishment
Experiments show that hostile attributional bias can be mitigated by:

1. Helping an aggressive child de-personalize the provocation
   *(Dodge & Frame, 1982, Child Development)*
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1. Helping an aggressive child de-personalize the provocation
   *(Dodge & Frame, 1982, Child Development)*

2. Helping an aggressive child relax before responding
   *(Dodge & Somberg, 1987, Child Development)*

3. Helping an aggressive child to slow down before responding
   *(Dodge & Newman, 1981, J Abnormal Psychology)*

4. Teaching an aggressive child to attend to all cues
   *(Dodge & Frame, 1982, Child Development)*

5. Teaching an aggressive child to utilize cues (not memories) when making an attribution
   *(Dodge & Tomlin, 1987, Social Cognition)*

6. Making a peer’s cues more clear
   *(Dodge, Murphy, & Buchsbaum, 1984, Child Development)*
The stop light metaphor teaches self-control and problem solving

STOP!
slow down
calm down

THINK!
see things differently
problem solve

GO!
try your best solution
see if it works
The Fast Track Study
1990: Era of “super-predator” and NIH funding

891 highly aggressive kindergarteners at 4 sites in 3 cohorts
-- 69% male; 45% African American; low SES
Randomly assign, by school cluster, to intervention or control
10-year intervention to change defensive processing
Follow up through age 25 (85%) and still ongoing

Level 1 (Individual)
\[ Y_{ij} = b_{0j} + b_{1j} \text{ (gender)} + b_{2j} \text{ (covariate)} + r_{ij} \]

Level 2 (School Classroom)
\[ b_{0j} = g_{00} + g_{01j} \text{ (site)} + g_{02j} \text{ (cohort)} + g_{03j} \text{ (intervention)} + g_{04j} \text{ (site x cohort)} + g_{05j} \text{ (site x intervention)} \]
\[ + g_{06j} \text{ (cohort x intervention)} + g_{07j} \text{ (site x cohort x intervention)} + u_{0j} \]
\[ B_{1j} = g_{10} + g_{11j} \text{ (site)} + g_{12j} \text{ (cohort)} + g_{13j} \text{ (intervention)} + g_{14j} \text{ (site x cohort)} + g_{15j} \text{ (site x intervention)} \]
\[ + g_{16j} \text{ (cohort x intervention)} + g_{17j} \text{ (site x cohort x intervention)} + u_{1j} \]
\[ B_{2j} = g_{2j}. \]
Fast Track Intervention Components

- Parenting groups plus home visits
- Peer coaching
- Friendship groups for defensive processing
- Classroom curricula in social-emotional learning (PATHS)
- Academic tutoring
Random assignment to FT intervention reduces defensive processing

Emotion Recognition Errors
Hostile Attributional Bias
Aggressive Response Generation
Aggressive Retaliation

Changes in defensive processing account for 25% of FT intervention effect on aggression

Random Assignment to Intervention

A. Hostile Attribution
B. Aggressive Response Generation
C. Aggressive Response Evaluation

Antisocial Behavior After Grade 9

-0.16* (-0.12 n.s.)

A: -0.21*  
B: -0.23*  
C: -0.15*

A: 0.21*  
B: 0.17*  
C: 0.10*

* Indicates p<.05.

Dodge, Godwin, & CPPRG, 2013, Psychological Science.
Intervention lowers testosterone release following provocation, which mediates FT intervention effect.

Random assignment to FT intervention leads to improvements in life outcomes at age 25

Dissemination of Fast Track and PATHS: Cognitive behavior therapy & social-emotional learning

Fast Track
4 countries; 8 sites

PATHS curriculum
24 countries; 750 school districts;
5,000 schools, 400,000 children
Can we apply similar concepts to the prevention of child abuse at the population level?
A pregnant woman’s defensive processing about her baby predicts child abuse at age 24 months
(500 pregnant women interviewed and followed across time)

Durham Connects
(With thanks to The Duke Endowment)

*Durham Connects* aims to:

1. Connect with every newborn parent by framing parenting task as important and baby as positive.
2. Connect families with community resources as needed.
3. Help parent connect with infant.

Umbrella of community resources
Cost: $600 per family
Evaluation of *Durham Connects*

1. Randomly assign every Durham resident birth over 18 months to intervention or control by even-odd birthdate (n=4,777)

2. Implement intervention
   -- 80% agree to participate
   -- 86% of agreeing parents complete program
   -- Fidelity to protocol = 86%, $K$ in scoring = .69

3. Outcomes measures:
   -- condition-blinded interviews at age 6 months
   -- administrative record review through age 48 months

4. Replication in second RCT and third field quasi-experiment
*Durham Connects* reduces emergency medical care episodes across first 12 months of life

Dodge et al., 2013, Pediatrics.
*Durham Connects* prevents child protective services investigations for child maltreatment through age 48 months.

36% reduction

Control

*Durham Connects*
Family Connects sites across the nation
Implications for Prevention, Practice, and Public Policy

1. Policies and practices that place aggressive children with each other will only strengthen their aggressive behaviors.
   - educational tracking, juvenile detention, residential care

2. Policies and practices that encourage a child to confirm a hostile world view will only deepen defensive processing and fail.
   - zero tolerance; expulsion; rejection from community; revenge

3. Policies that provide consequences for misbehavior while not allowing the child to perpetuate this world view will succeed.
   - rules with opportunity for regaining status
Implications for Other Domains and Daily Behavior

Similar processes may operate in:

- marital relations
- race relations
- work environments
- international relations

Resist the pull to become defensive in processing the world.
-- attend to positive cues and make positive attributions
The Antidote to Defensive Processing

In October, 1962, the Soviet Union placed nuclear missiles in Cuba and pointed them toward the United States. The world expected a nuclear war to ensue. President John F. Kennedy received two cryptic, contradictory messages from Soviet Premier Nikita Khrushchev:

1. On October 26, a message stated Soviet intent to withdraw missiles, as long as U.S. agreed not to invade.
2. On October 27, a new message more aggressively stated Soviet intent to launch missiles immediately unless the U.S. backs down and leaves Cuba and Turkey.

Audiotapes show that Kennedy wanted to interpret Khrushchev benignly and to declare his own benign intentions. He decided to ignore the second message and to accept the first. Kennedy wrote to Khrushchev:

“I have read your letter of October 26 with great care and welcomed your statement of your desire to seek a prompt solution...the United States is very much interested in reducing tensions...I hope we can quickly agree...”

and we are still alive today.