Behavioral Economics: What it is and Why Applied Behavior Analysts Should Care

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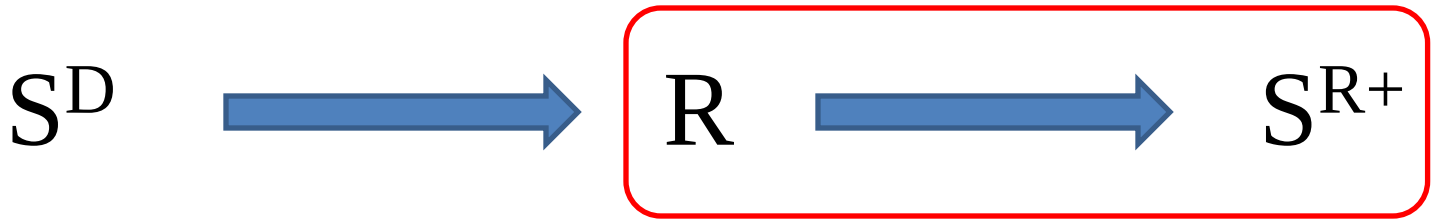


stimulus value

Overview

- *Reinforcement arrangements for children with ASD*
  - *What are we good at?*
  - *What remains to be understood?*

- *Behavioral economics: Tools for gauging stimulus value*
  - *Demand curves*
    - *Demand elasticity*
    - *Substitutable reinforcers*
    - *Interaction with interventions in ASD*
  - *Delay Discounting*

- *Some determinants of stimulus value*
  - *Contiguity: Reinforcer delay*
  - *Continuity: Reinforcer accumulation*
  - *Contingency: Historical effort and subsequent stimulus value*

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 1985, 18, 249–255 NUMBER 3 (FALL 1985)

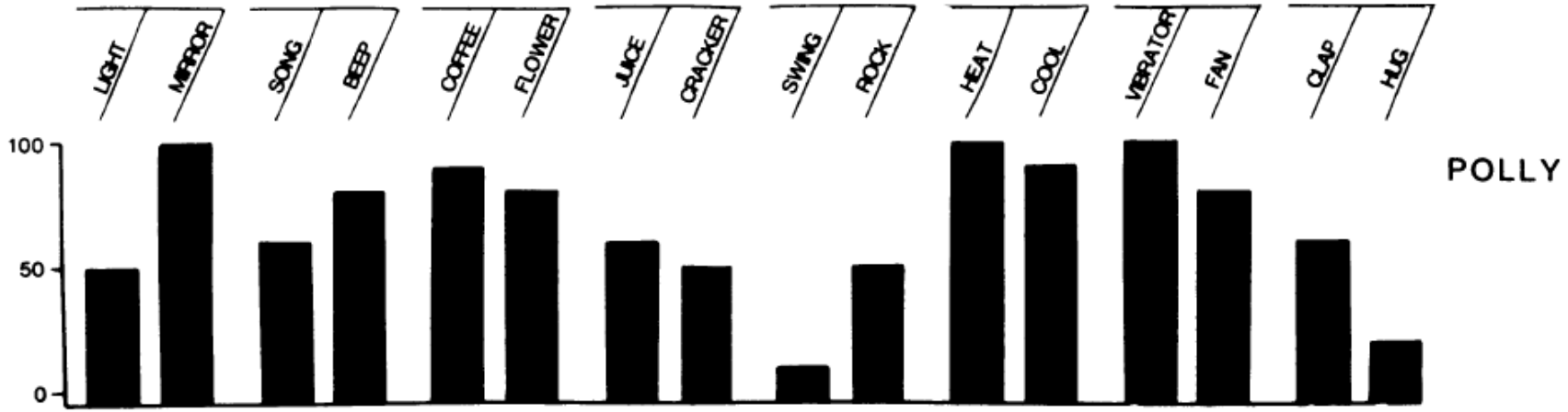
ASSESSMENT OF STIMULUS PREFERENCE AND REINFORCER VALUE WITH PROFOUNDLY RETARDED INDIVIDUALS

GARY M. PACE, MARTIN T. IVANCIC, GLYNNIS L. EDWARDS,
BRIAN A. IWATA, AND TERRY J. PAGE

THE JOHN F. KENNEDY INSTITUTE AND THE JOHNS HOPKINS
UNIVERSITY SCHOOL OF MEDICINE

"I am not sure we need more preference assessment research...we are already very good at it"

Gary Pace, Ph.D.



"I am not sure we need more preference assessment research...we are already very good at it"

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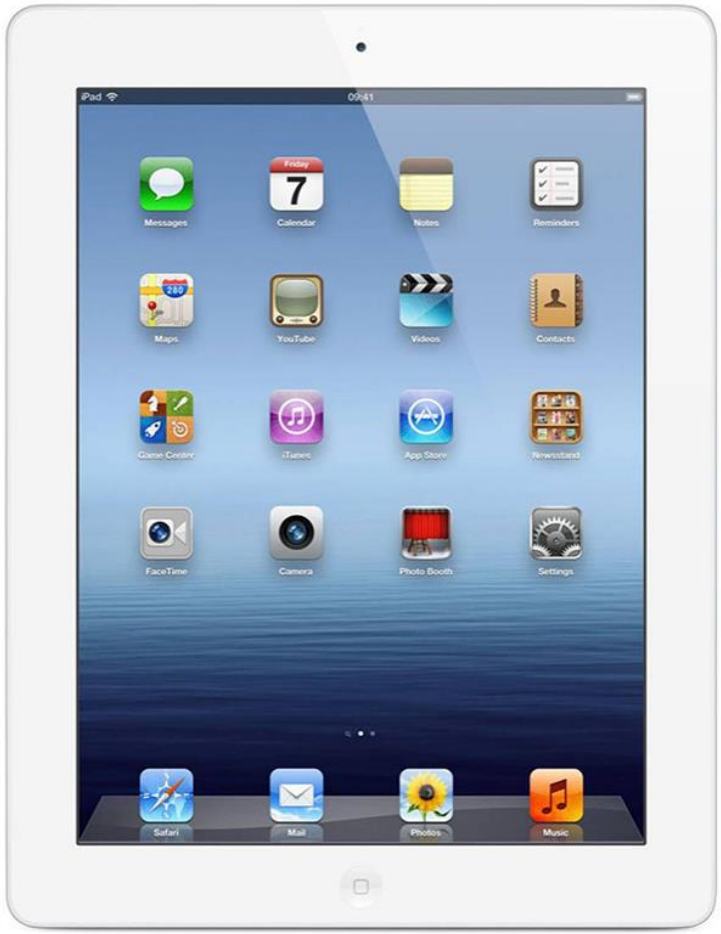
Do we need more preference assessment research?



We are done.

What's Left to Do?

- *Have we nailed it?*
  - *Developed methods*
  - *Examined stability & motivational operation effects*
  - *Matching methods to purpose & circumstance*

Matching Methods to Purpose & Circumstance

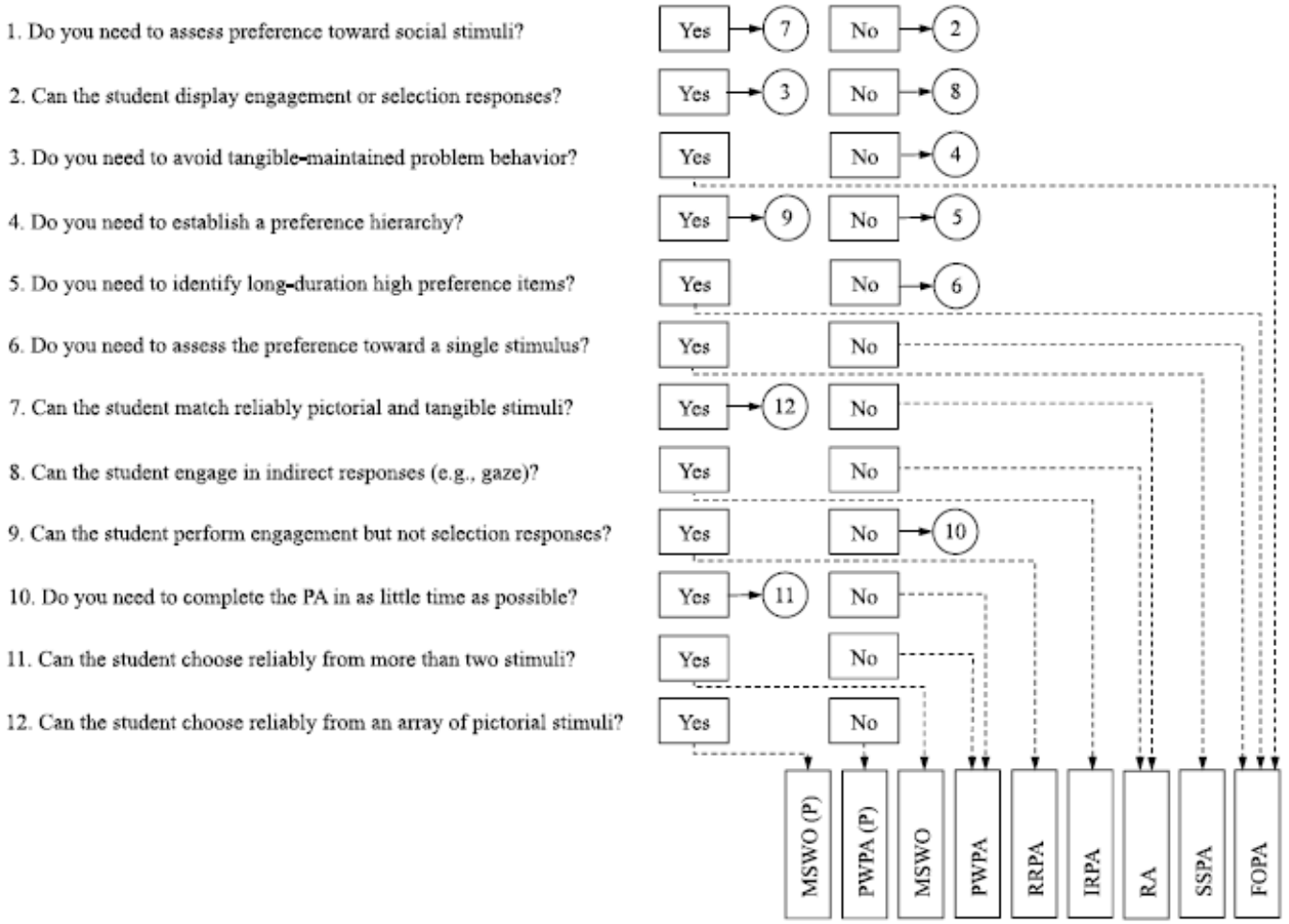


Figure 4. Decision tree for the selection of preference assessment methods.
Notes. *FOPA* = Free operant preference assessment; IRPA = Indirect/idiosyncratic response preference assessment; MSWO = Multiple-stimulus without replacement; PA = Preference assessment; PWPA = Pairwise preference assessment; (P) = Pictorial stimuli; RA = Reinforcer assessment; RRPA = Response-restriction preference-assessment; SSPA = Single stimulus preference assessment.

Virues-Ortega et al. (2014) American Journal on Intellectual and Developmental Disabilities

What's Left to Do?

- *Have We Nailed It?*
  - *Developed methods*
  - *Examined stability & motivational operation effects*
  - *Matching methods to purpose & circumstance*

- *Getting Close?*
  - *Do we really need a hierarchy?*
  - *Verbal and pictorial preference assessments*
  - *Overjustification effects*

Overjustification Effects in IDD

Q: Do extrinsic rewards decrease intrinsic motivation in persons with IDD??

TABLE 1

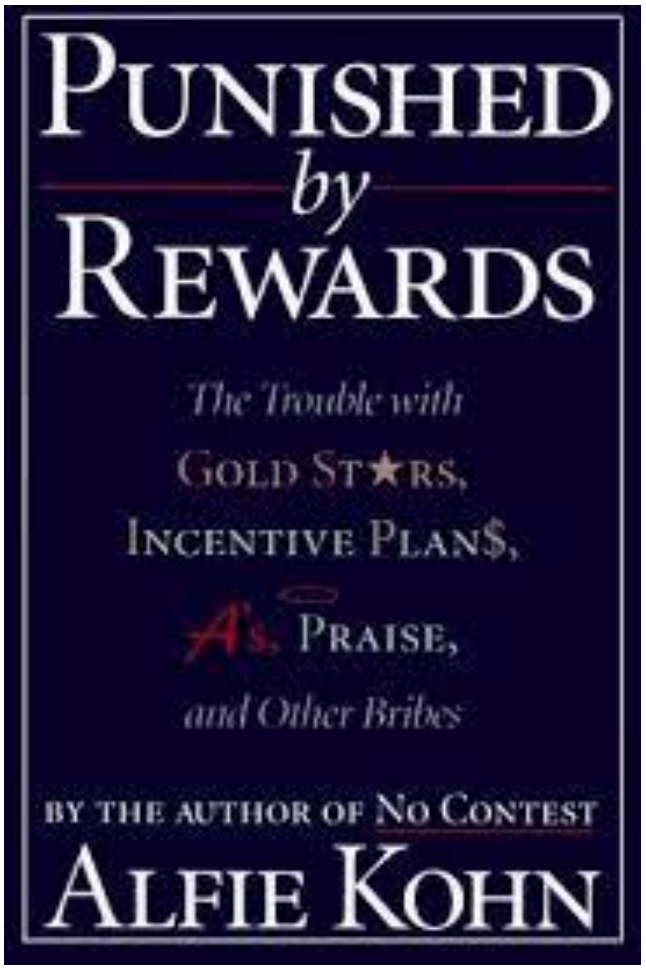
MEAN NUMBER OF SECONDS SPENT WORKING ON THE PUZZLE DURING THE EIGHT-MINUTE FREE CHOICE PERIODS

Group	Time 1	Time 2	Time 3	Time 3 − Time 1
Experimental (n = 12)	248.2	313.9	198.5	−49.7
Control (n = 12)	213.9	205.7	241.8	27.9
		$E(T_3 - T_1)$ − $C(T_3 - T_1)$		−77.6 sec.* (SE = 58.5)

Note.—The higher the score, the higher the motivation.
* $p < .10$, $df = 22$, one-tailed t test.

Deci (1971), Journal of Personality and Social Psychology

Overjustification



"…extrinsic motivators—including *A's, sometimes praise, and other rewards—are not merely ineffective over* the long haul but counterproductive with respect to the things that concern us most: desire to learn, commitment to good values, and so on."

Alfie Kohn
Educational Leadership

Overjustification Effects in IDD

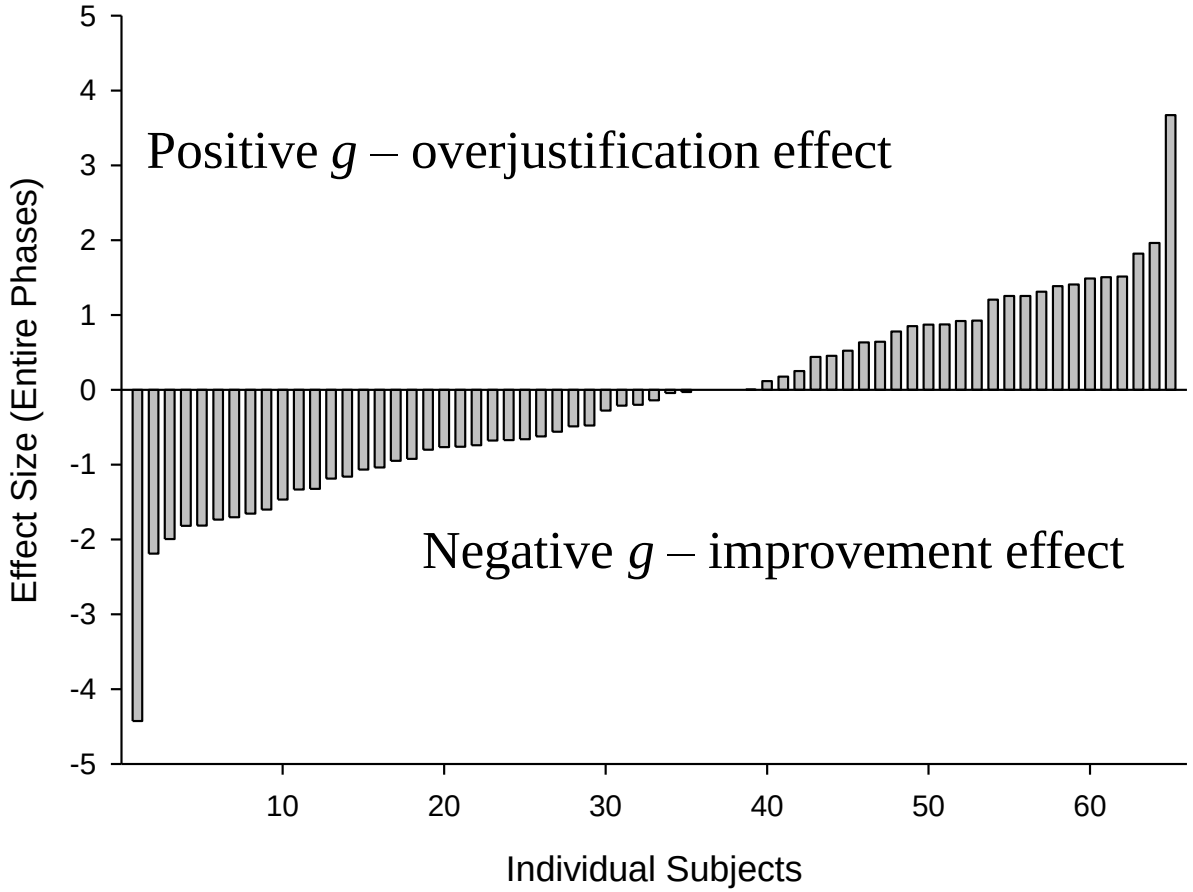


Figure 1. Distribution of effect sizes for each individual included in the analysis. Effect sizes in the top graph were calculated using the entire phase, effects size in the bottom graph were calculated using only the last 3 sessions of each phase.

Levy, DeLeon, Martinez, Fernandez, Gage, Sigurdsson, & Frank-Crawford (2016), JABA

Overjustification Effects in IDD

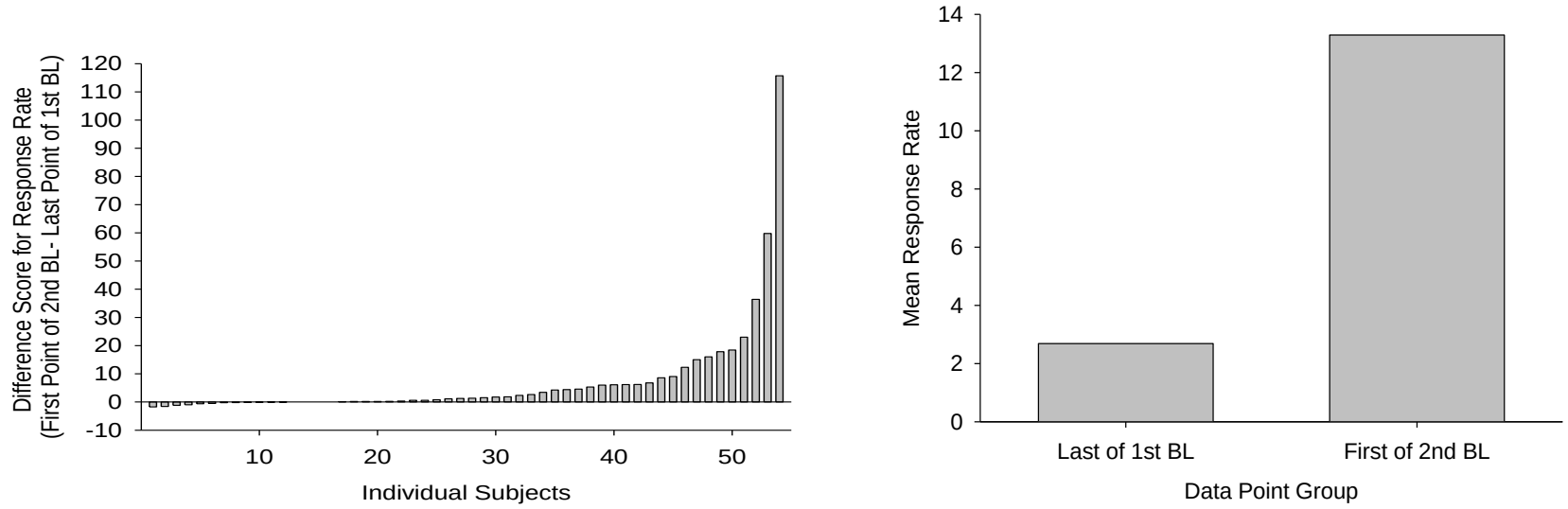


Figure 2. Distribution of difference scores (left panel) and mean responding for the last point of the first no-reinforcement phase and first point of the second no-reinforcement phase (right panels).

- Little evidence of systematic OJE in IDD
  - Effect sizes were just as likely to be negative or positive
- Even if OJE occur, programmed contingencies:
  - Establish repertories that place one in contact with more frequent SR+
  - Lay groundwork for adaptive functioning

Levy, DeLeon, Martinez, Fernandez, Gage, Sigurdsson, & Frank-Crawford (2016), JABA

What's Left to Do?

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  - *Developed methods*
  - *Examined stability and its determinants*
  - *Effects of motivational operations*
  - *Matching methods to purpose & circumstance*

- *Getting Close?*
  - *Do we really need a hierarchy?*
  - *Verbal and pictorial preference assessments*
  - *Overjustification effects*

- *Where are the data?*
  - *But…does it enhance learning?*
  - *Establishing reinforcers and transferring control*
  - *Determinants of reinforcer effectiveness (stimulus value)*

Determinants of Stimulus Value

- "Mainstream" Behavioral Economics
  - *Psychological concepts applied towards understanding human decision-making*
  - *Human irrationality; cognitive biases, suboptimal choice*
- Behavioral Economics in Behavior Analysis
  - *"...concepts from microeconomic theory are extended to the study of consumption by a range of species in the laboratory and the concepts of operant conditioning are extended to an understanding of demand for economic commodities."*

    Hursh, Madden, Spiga, DeLeon, & Francisco (2013)
  - *Choice and consumption under conditions of constraint; determinants of stimulus value*

Behavioral Economics

- Why import microeconomic theory into BA?
  - *Many points of convergence*
    - Understanding determinants of the value of goods
    - Interest in the process of choice
  - *Once parallels are drawn, suggests relations heretofore only considered by economists*
    - New phenomena previously ignored
    - New functional relations previously unnamed

Behavioral Economics

- Commodities
  - *Econ: Goods and services*
  - *B. Econ: Reinforcers*

- Unit Price:
  - *Econ: $$$ paid per unit of commodity (2.25 per gallon)*
  - *B. Econ: Number of responses "paid" per unit of reinforcer*

- Consumption:
  - *Econ: Total quantity of a commodity consumed, typically at the group or population level*
  - *B. Econ: Total amount of a reinforcer obtained per unit time,* ***typically at the individual level***

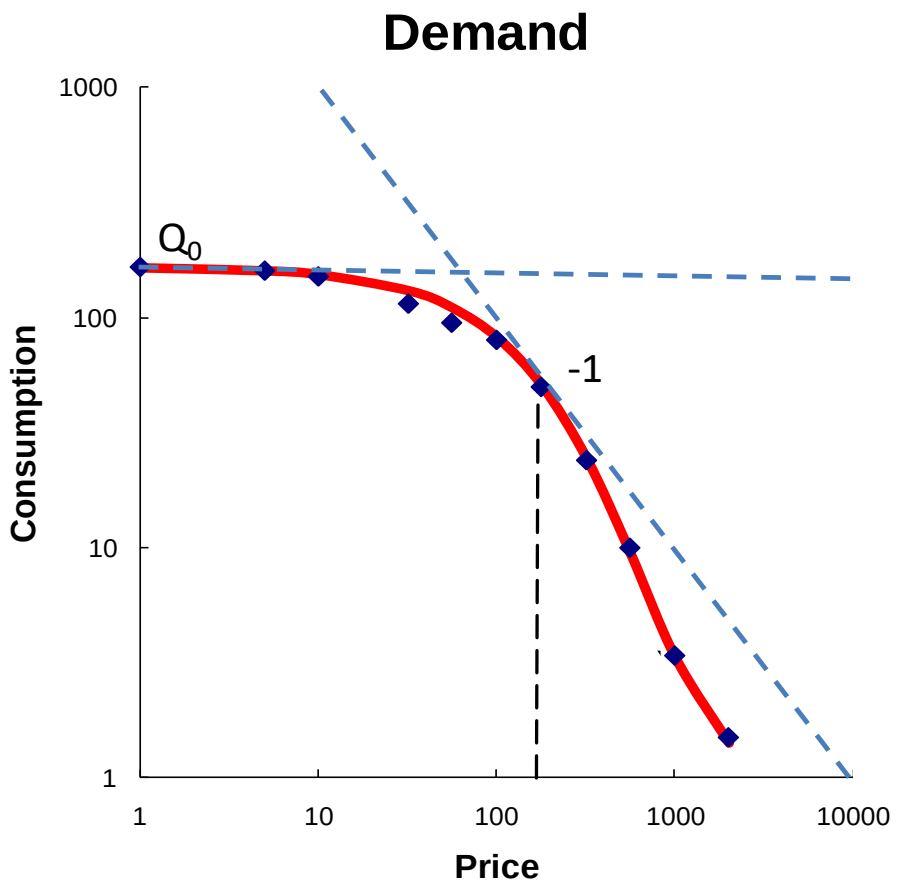
Behavioral Economics

Demand curves relate:

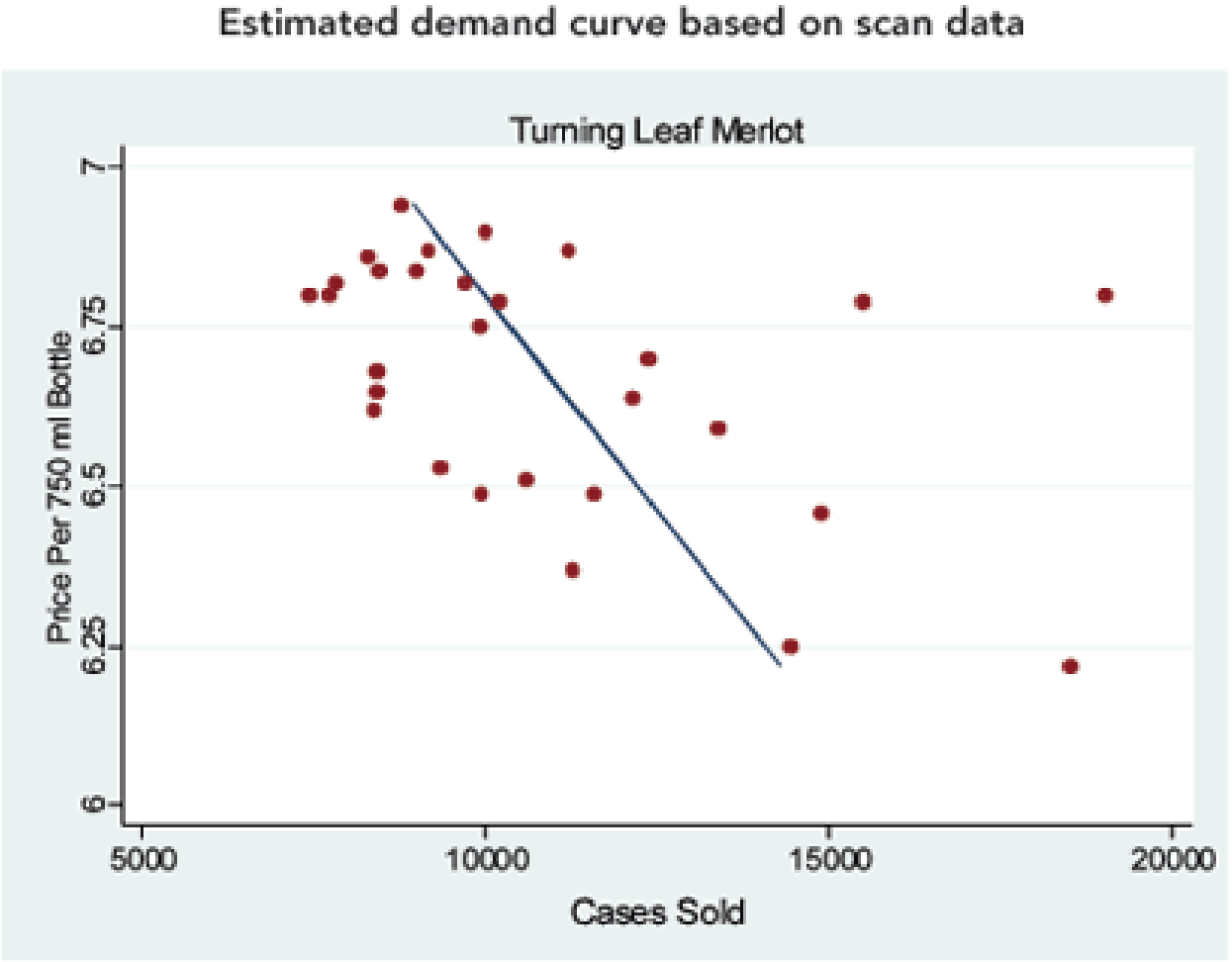
- *Unit price of the commodity*
- *Amount of the commodity consumed*

Law of Demand:

- All else being equal…
  - *As unit price increases*
  - *demand (consumption) decreases*
  - *and vice versa*

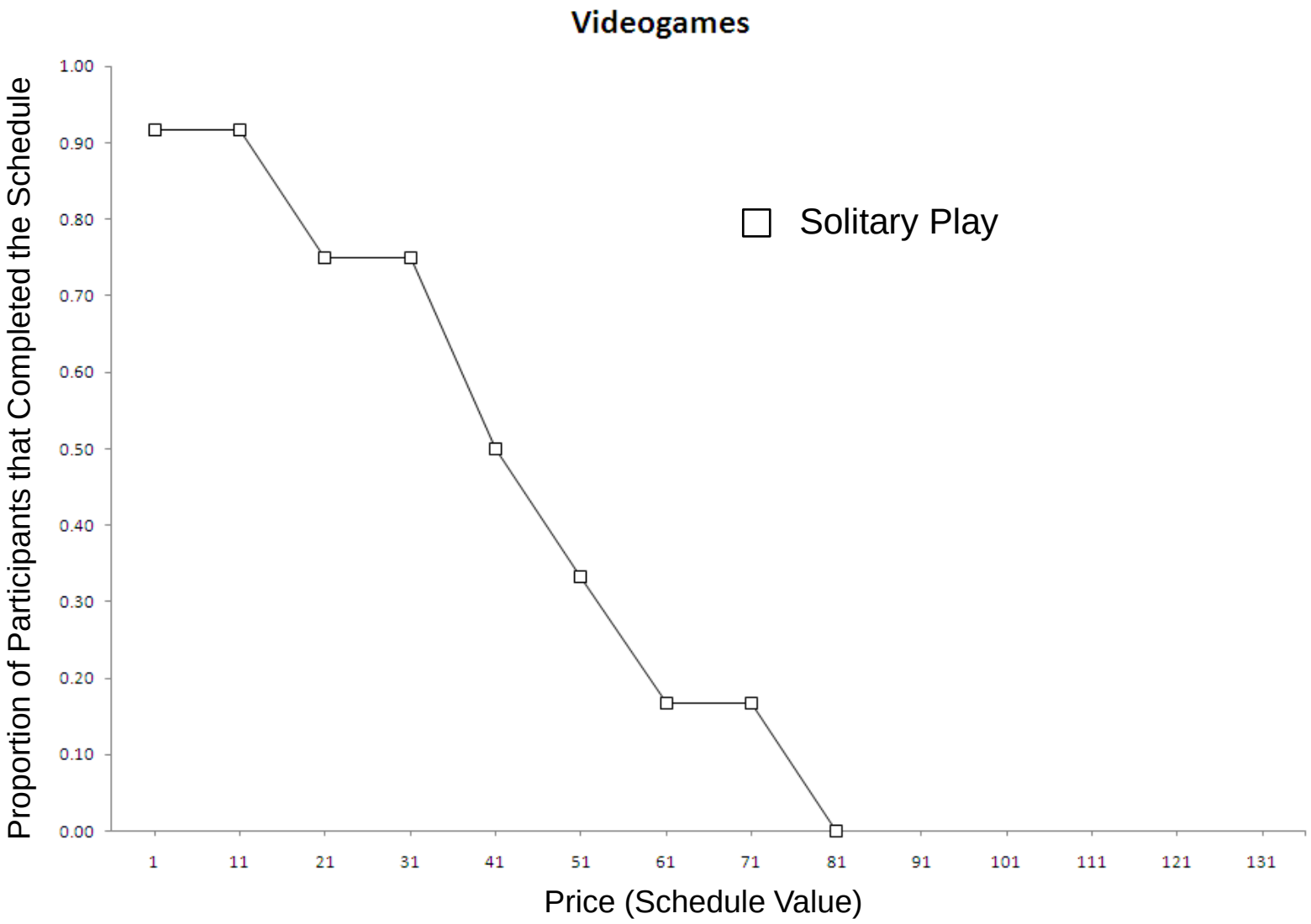


Population Demand Curve



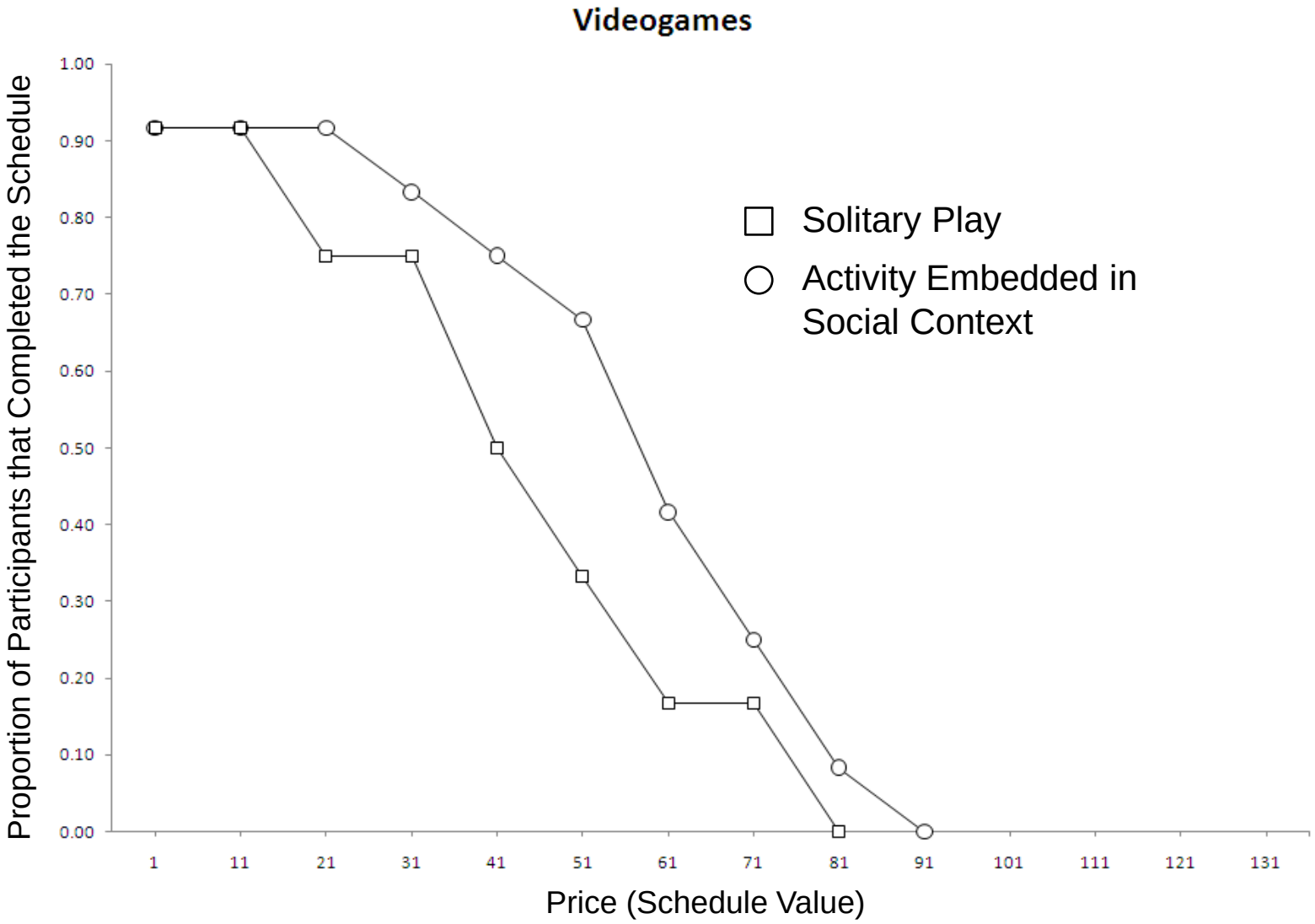
Above, the estimated demand curve of Turning Leaf Merlot illustrates the inverse relationship between price and quantity.

Group Demand Curve



Goldberg, Allman, Hagopian, Triggs, Frank-Crawford, Mostofsky, Denckla, & DeLeon (2016), Autism

Group Demand Curve



Goldberg, Allman, Hagopian, Triggs, Frank-Crawford, Mostofsky, Denckla, & DeLeon (2016), Autism

Individual Demand Curve

The same sort of relations influence consumption on the <u>individual</u> level.

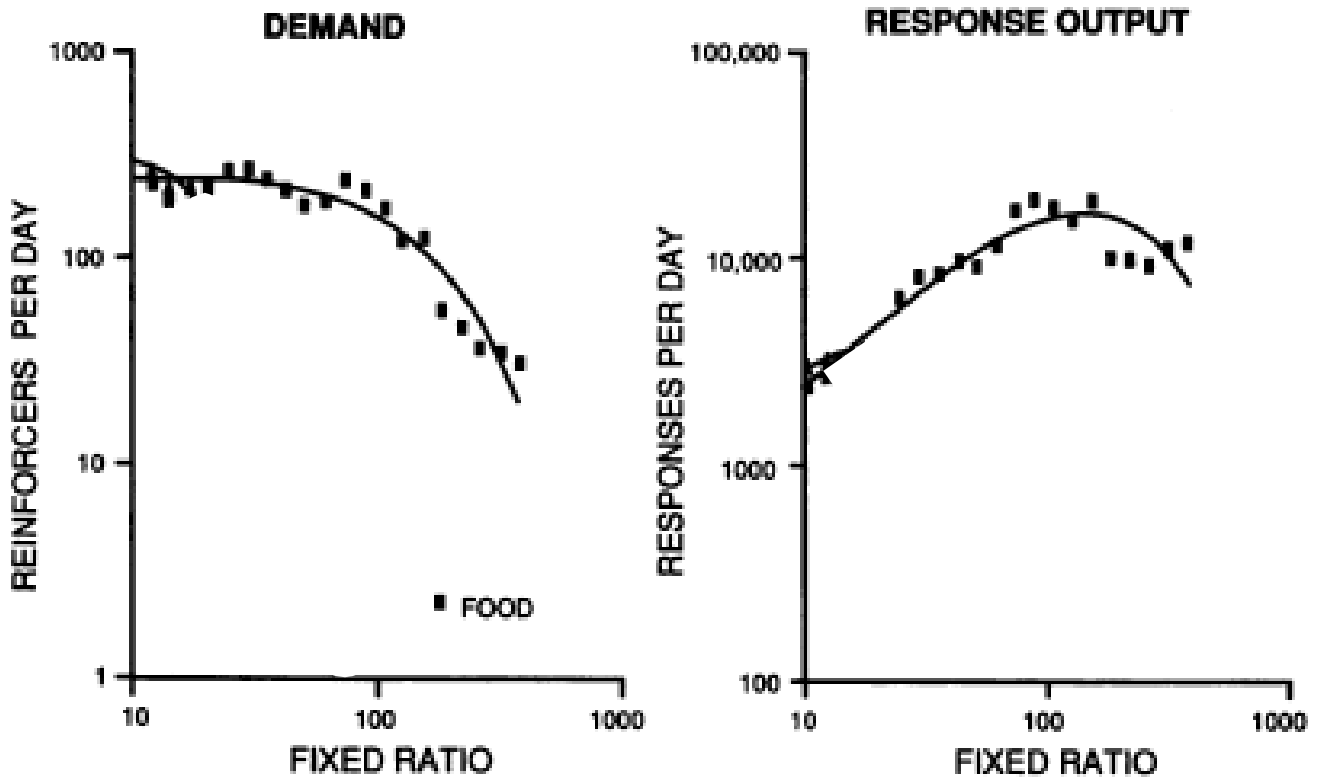


Fig. 4. Left panel: Daily consumption of food or saccharin as a function of FR schedule, in log–log coordinates. Right panel: Total daily lever presses for either food or saccharin as a function of FR schedule, in log–log coordinates. Data from a representative rhesus monkey.

Hursh (1991) JEAB

Elasticity of Demand

Elasticity of demand = sensitivity to price

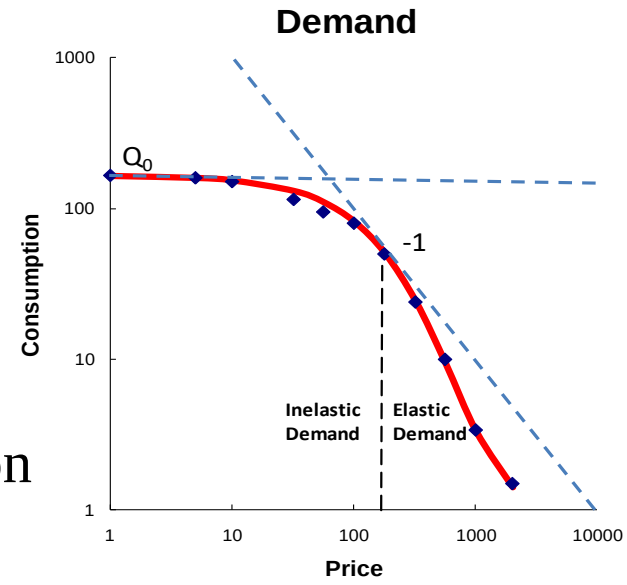
- extent to which changes in unit price influence consumption

Inelastic demand - Changes in price produce less than proportional changes in consumption

E.g., 1% increase in price produces
< 1% decrease in consumption

Elastic demand – Changes in price produce larger than proportional changes in consumption

E.g., 1% increase in price produces
> 1% decrease in consumption



What Influences Elasticity of Demand?

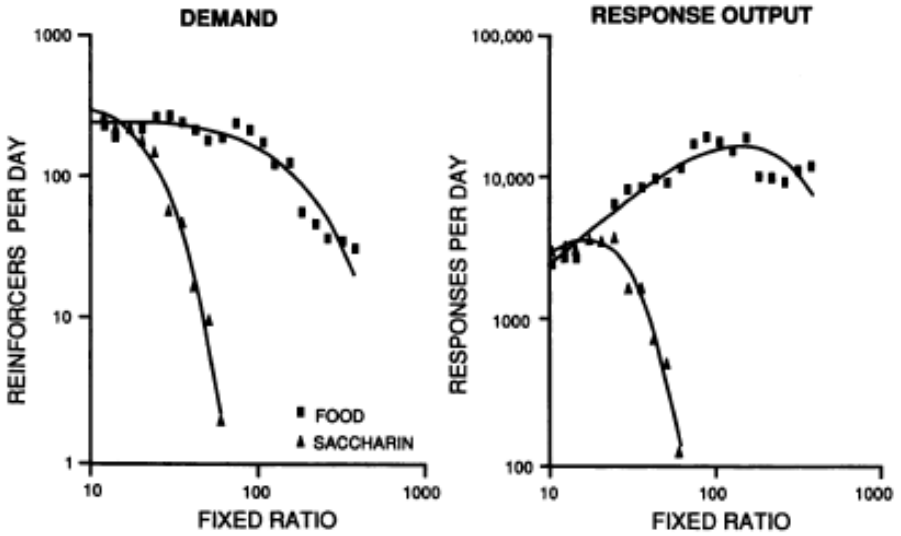
- Constraints on income re: “luxury goods” vs. “necessary goods”
  - *Demand for luxury goods is more elastic*

- Open vs. closed economies
  - *The extent to you can access the commodity outside the conditions of constraint*
  - *Demand is more elastic under open economies*

- Availability and price of substitutable commodities
  - *Demand is more elastic when substitutes are available*
  - *E.g. Demand for gasoline at is relatively inelastic; demand for Coca-Cola is not*

Elasticity of Demand & Substitution

Q: How is reinforcer effectiveness influenced by the nature of other qualitatively different reinforcers in the environment?



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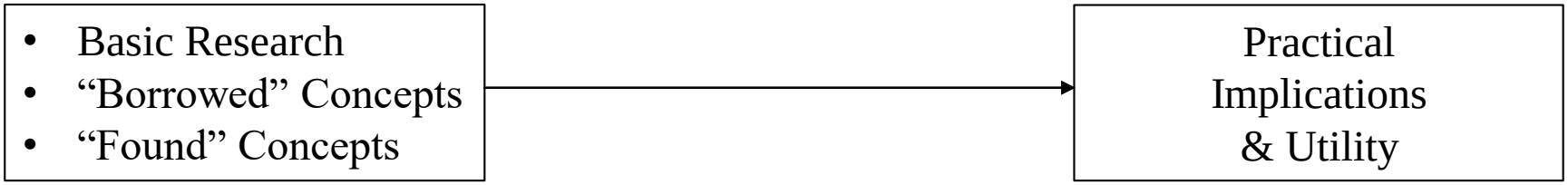
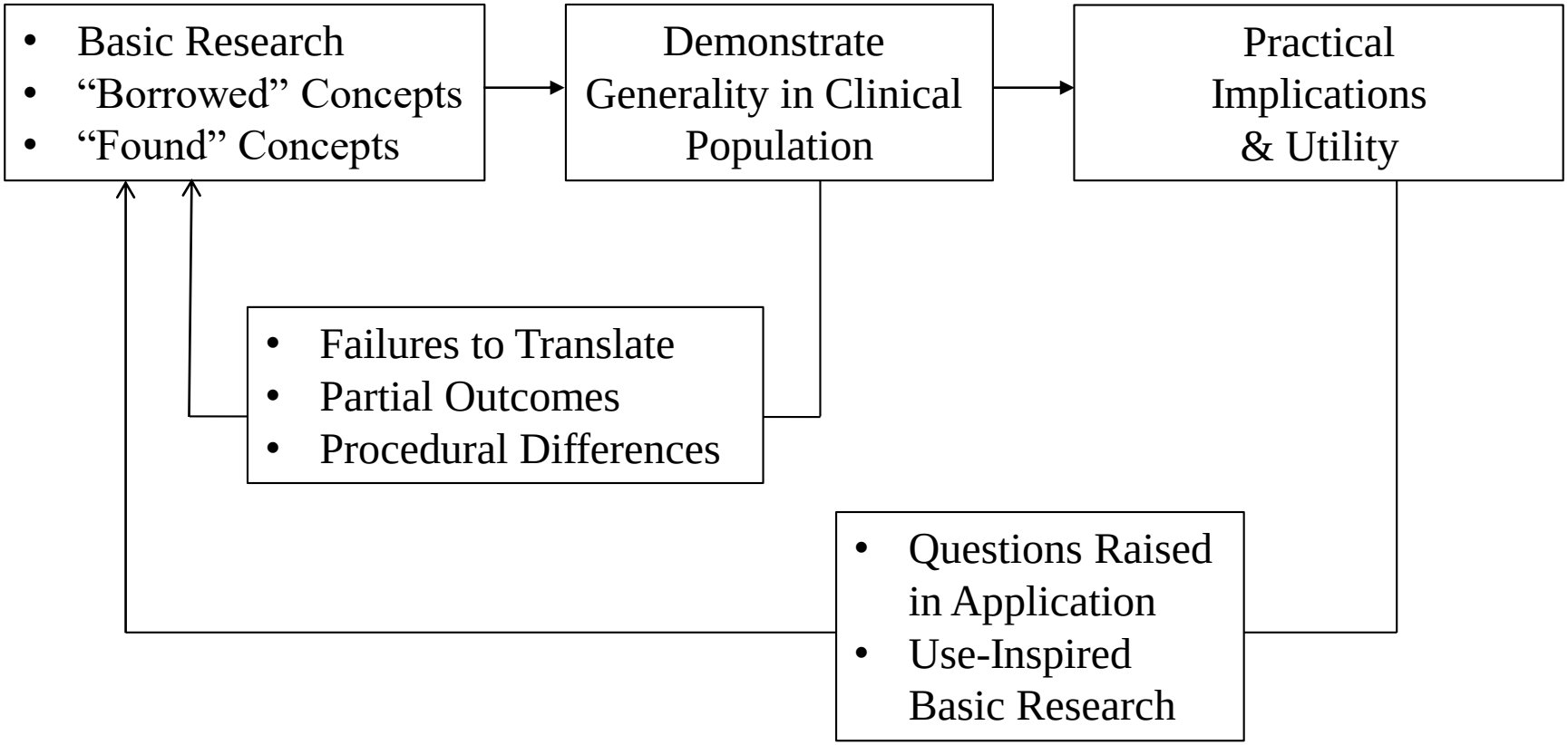
- ***Stimuli with equivalent initial consumption under low cost conditions may have very different demand profiles***
- ***More "durable" (less elastic) demand for a reinforcer, as the price increases, when it is dissimilar from the available alternatives.***

Hursh (1991) JEAB

Translational Research in BA

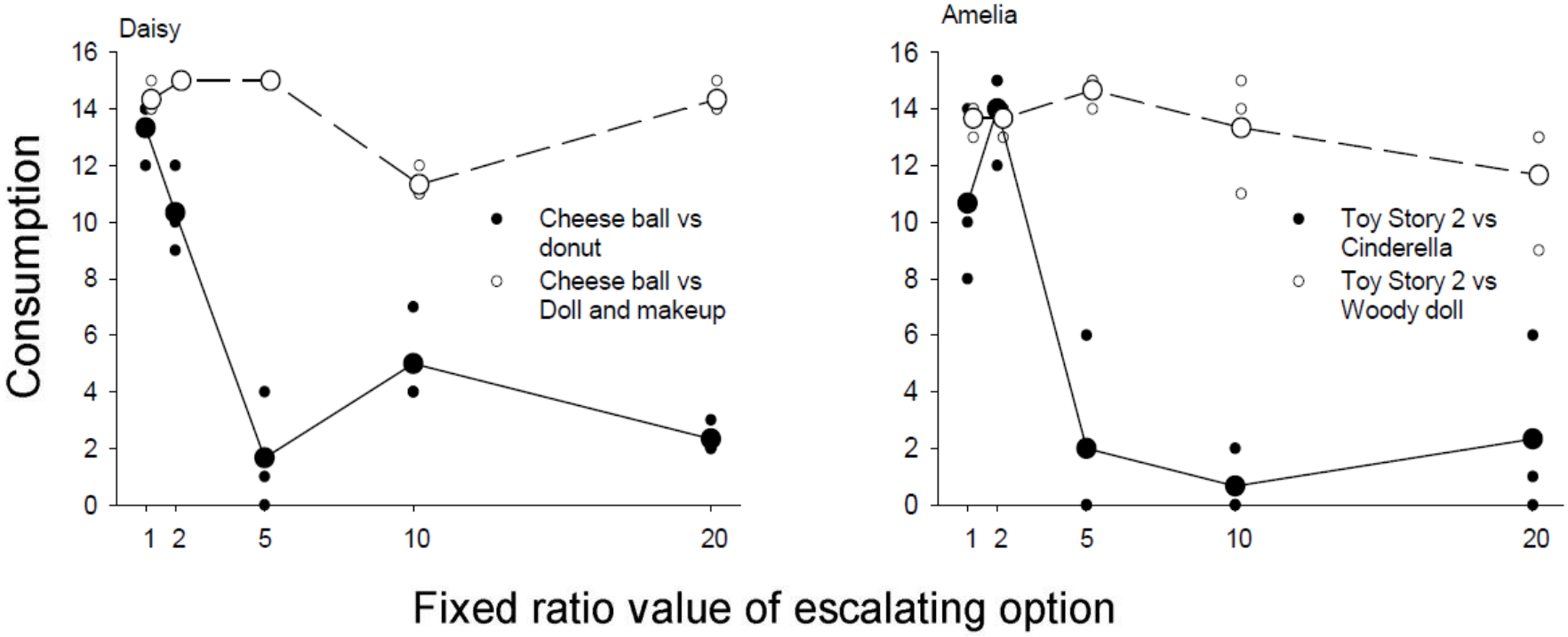


Translational Research in BA



Substitution and Demand Elasticity

Q: Do similar findings obtain in children with IDD?



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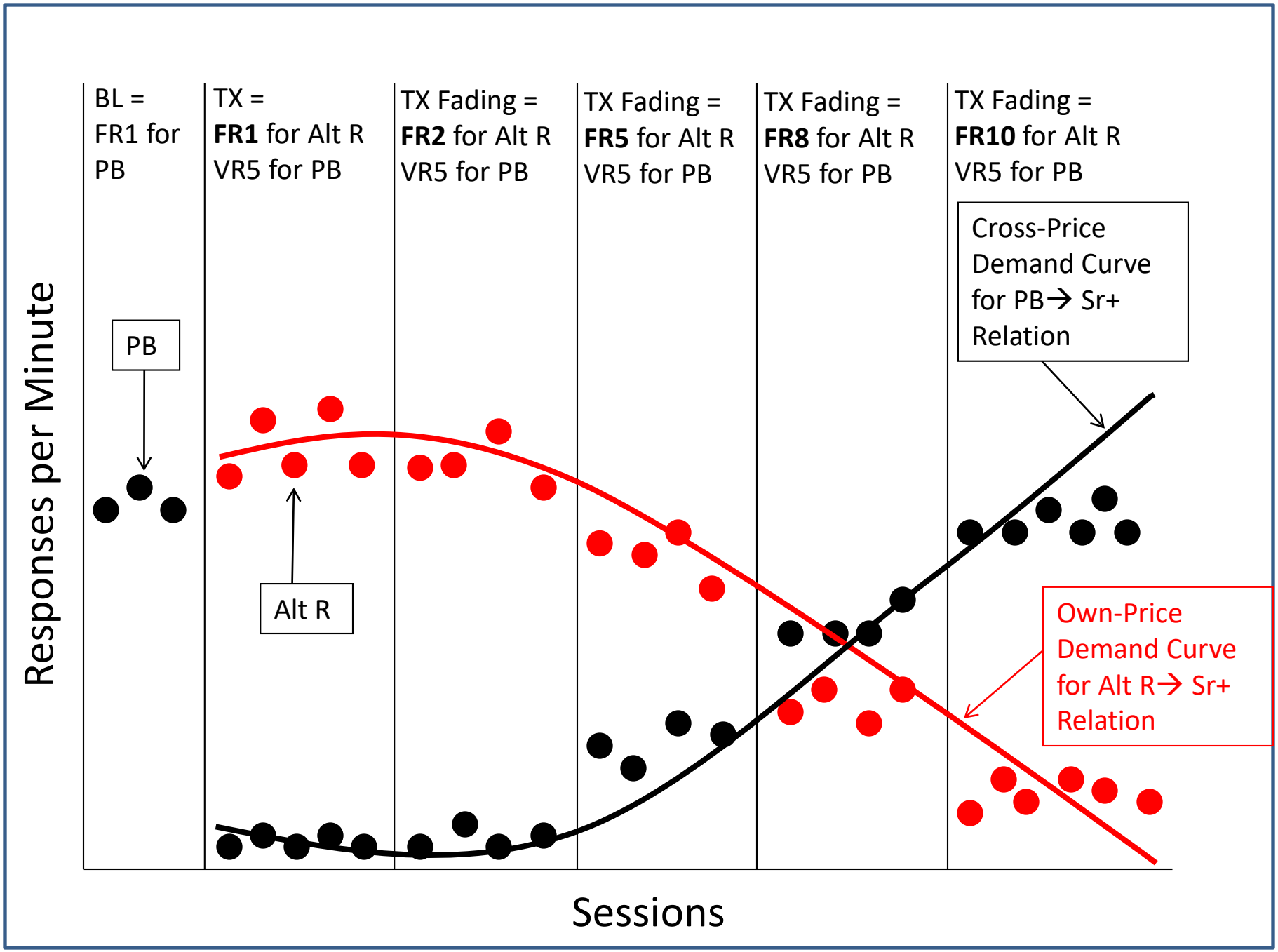
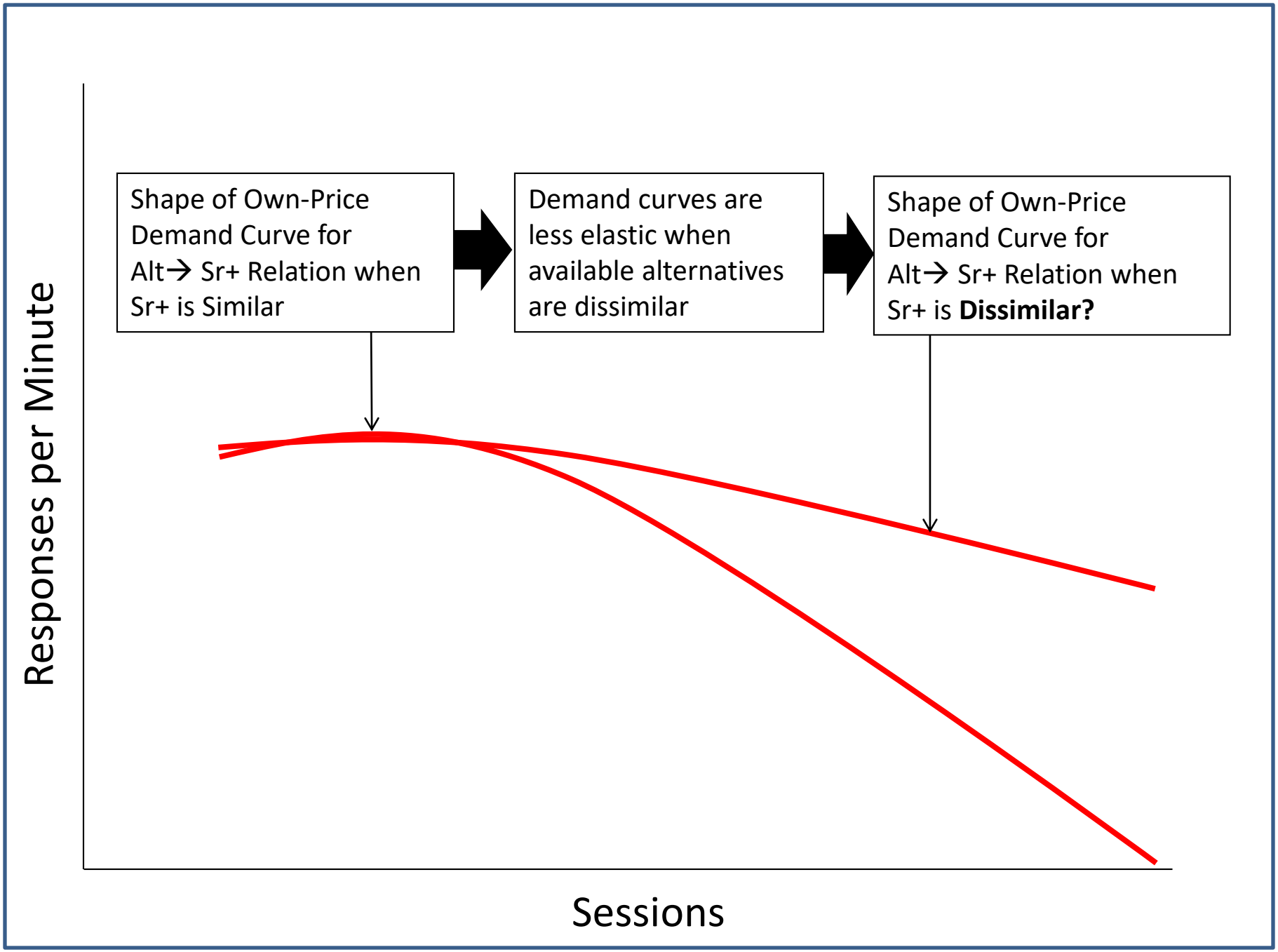
DeLeon, Hursh, Frank-Crawford, Bullock, Triggs, & Carreau-Webster (accepted), JEAB

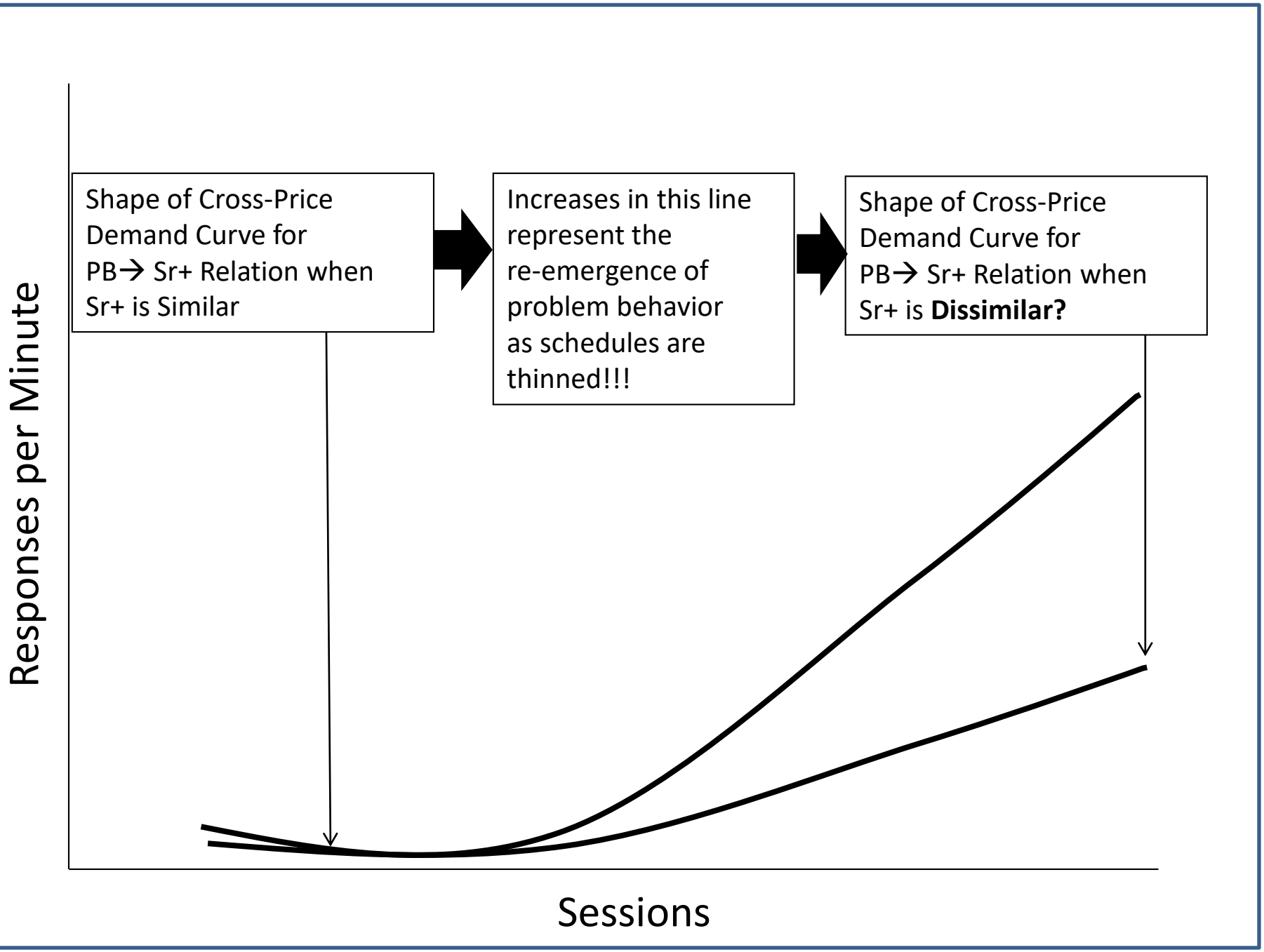
Implications for the Treatment of PB?

Conventional course of intervention for PB in IDD:

- *Functional assessment identifies the "functional reinforcer" maintaining problem behavior*
- *Some form of differential reinforcement*
  - *Provide functional reinforcer for alternative behavior*
  - *Extinction – disrupt contingency between PB and reinforcer*
- *Schedule thinning makes intervention practicable*


BL = FR1 for PB
TX = **FR1** for Alt R VR5 for PB
TX Fading = **FR2** for Alt R VR5 for PB
TX Fading = **FR5** for Alt R VR5 for PB
TX Fading = **FR8** for Alt R VR5 for PB
TX Fading = **FR10** for Alt R VR5 for PB
Cross-Price Demand Curve for PB→ Sr+ Relation
PB
Alt R
Own-Price Demand Curve for Alt R→ Sr+ Relation
Responses per Minute
Sessions


Shape of Own-Price Demand Curve for Alt→ Sr+ Relation when Sr+ is Similar
Demand curves are less elastic when available alternatives are dissimilar
Shape of Own-Price Demand Curve for Alt→ Sr+ Relation when Sr+ is **Dissimilar?**
Responses per Minute
Sessions


Shape of Cross-Price Demand Curve for PB→ Sr+ Relation when Sr+ is Similar
Increases in this line represent the re-emergence of problem behavior as schedules are thinned!!!
Shape of Cross-Price Demand Curve for PB→ Sr+ Relation when Sr+ is **Dissimilar?**
Responses per Minute
Sessions

What Does it Mean for the Treatment of PB?

In English….from the behaver's point of view:

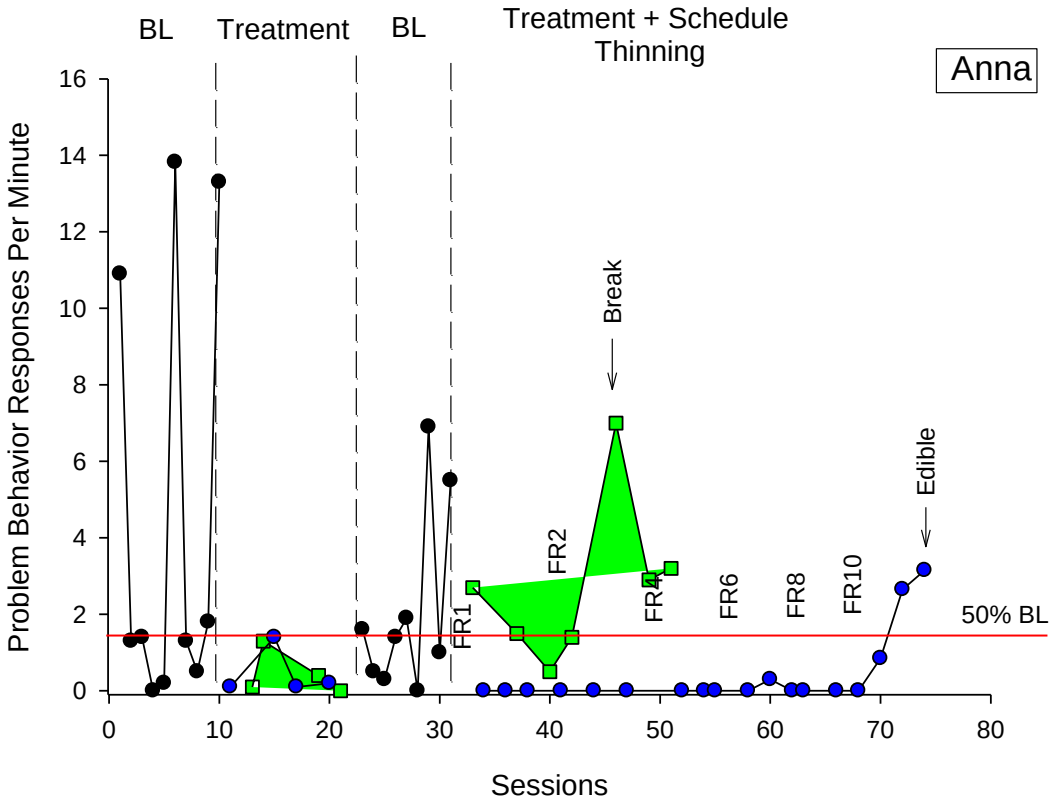
- *Why should I work hard to produce an outcome that is more easily produced through another response?*

- *However, if what you are offering for my work is:*
  - *Valuable*
  - *Not something I can already produce through a different response*

- *Then perhaps I might be willing to work a little harder to get it.*

Translation: Substitution and Stimulus Value

Q: What are the clinical implications?



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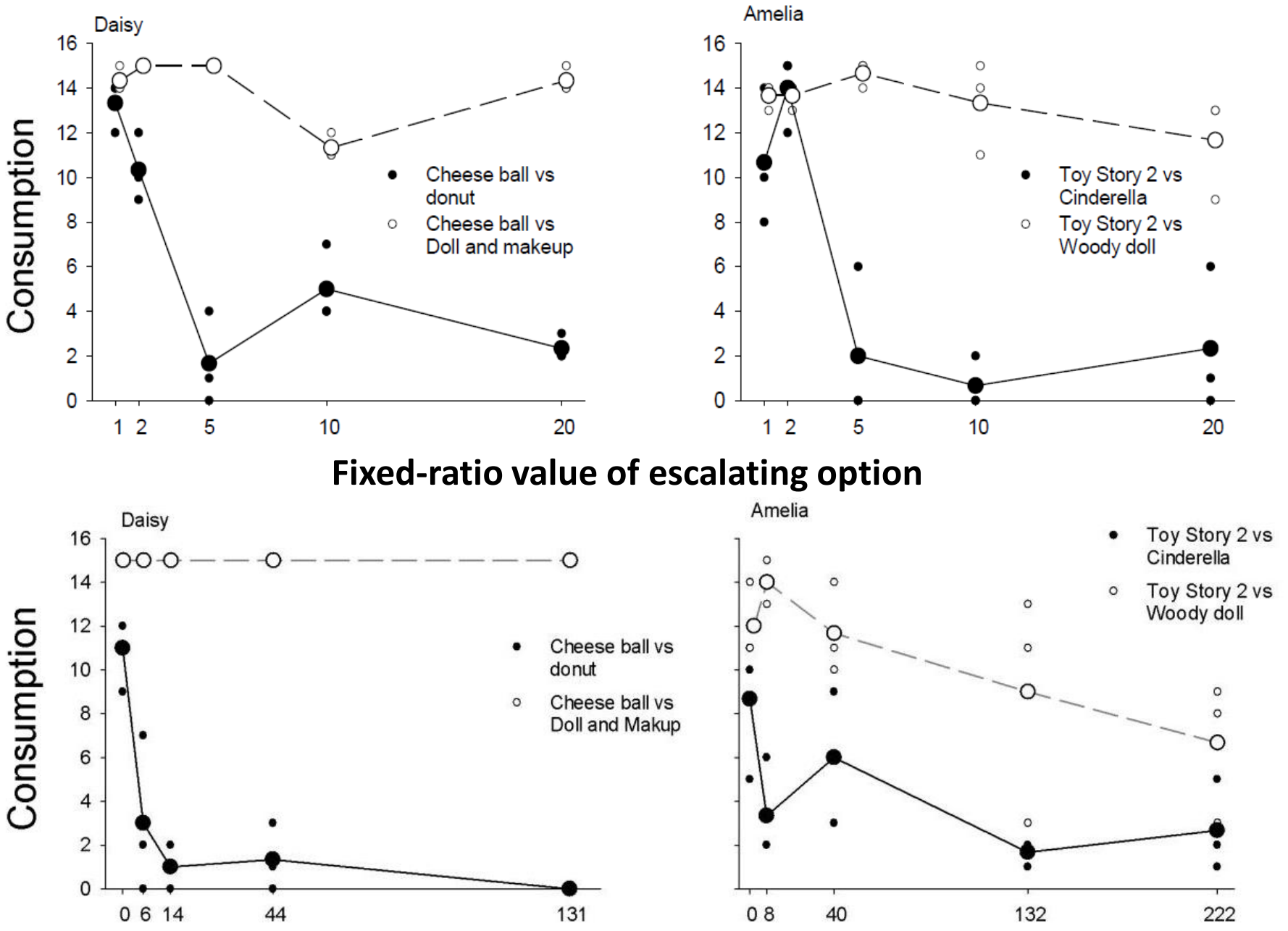
- ***More "durable" (less elastic) demand for a reinforcer, as the price increases, when it is dissimilar from the available alternatives.***

Translation: Substitution and Stimulus Value

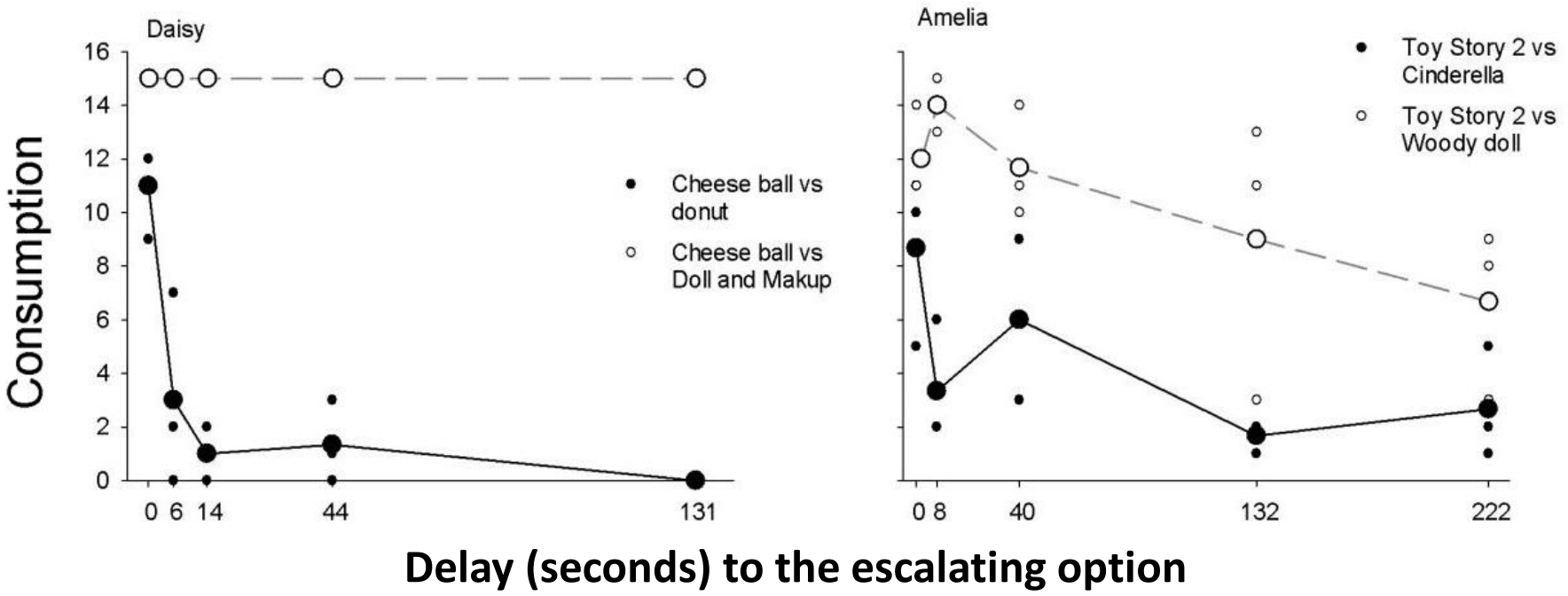
- ***If problem behavior continues to be reinforced, (extinction is impracticable)***, and
  - The schedule for appropriate behavior is thinned
  - Arranges a situation analogous to:
    - Holding the cost of the reinforcer for problem behavior constant, while…
    - Increasing the cost of the reinforcer for the alternative behavior
    - In essence…a demand curve
- ***Applying economic analysis lets us consider ways to enhance interventions based on what influences demand curves***


Daisy
Consumption
16
14
12
10
8
6
4
2
0
1 2 5 10 20
Cheese ball vs donut
Cheese ball vs Doll and makeup
Amelia
Toy Story 2 vs Cinderella
Toy Story 2 vs Woody doll
Fixed-ratio value of escalating option
Daisy
Consumption
0 6 14 44 131
Cheese ball vs donut
Cheese ball vs Doll and Makup
Amelia
Toy Story 2 vs Cinderella
Toy Story 2 vs Woody doll
0 8 40 132 222
Delay (seconds) to the escalating option

Determinants of Value: Delay Discounting

Demand curves vary with similarity of available alternatives

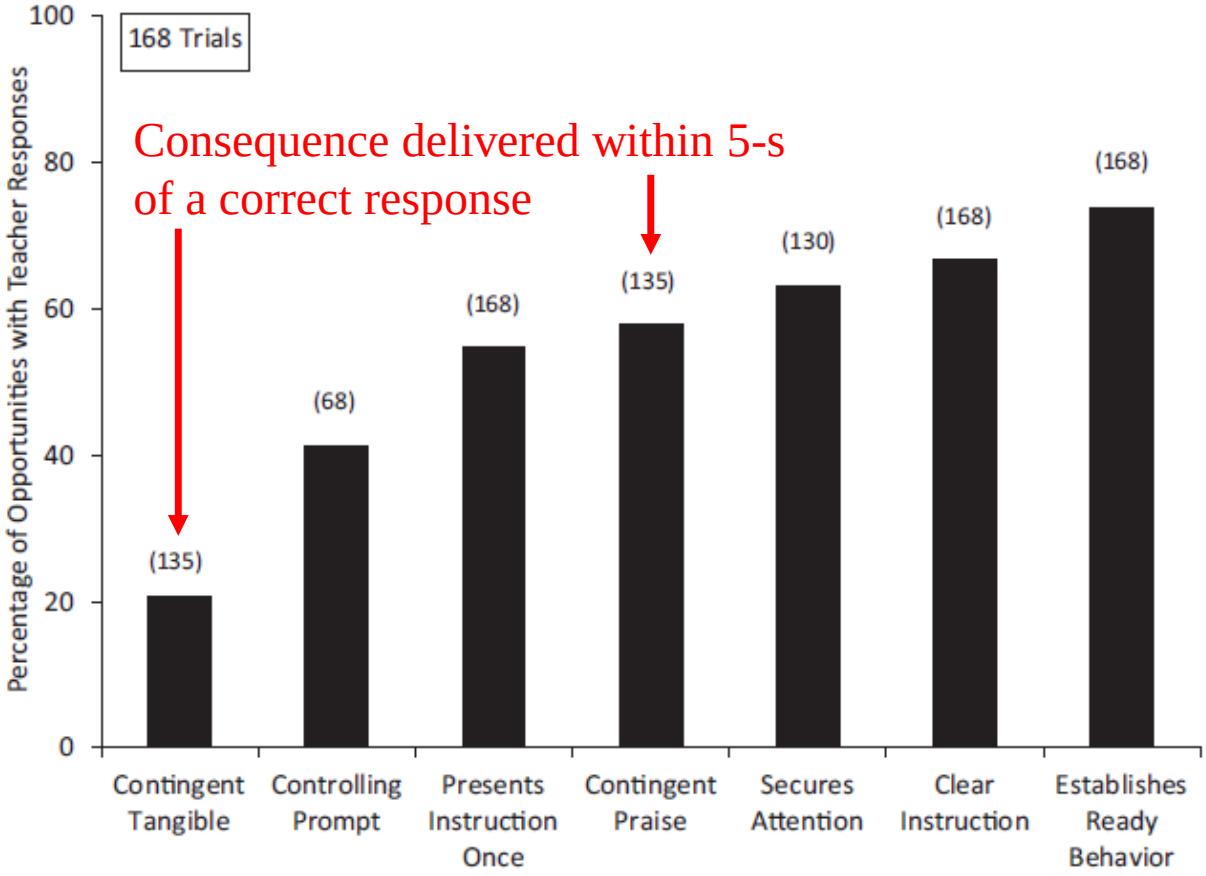
- Consumption declines more rapidly as ***delay*** increases when the alternative is functionally similar
- ***Reinforcer delay is a "cost"***



Q: How often do teachers deliver reinforcers immediately following a correct response ?

Descriptive assessment of integrity errors

- Observed 168 teaching trials
- Across 5 children with ASD attending EIBI clinics
- 9 teachers or paraprofessionals delivering instruction



Carroll, Kodak, & Fisher (2013) Journal of Applied Behavior Analysis

Q: How do reinforcer delays impact reinforcer effectiveness during skill acquisition?

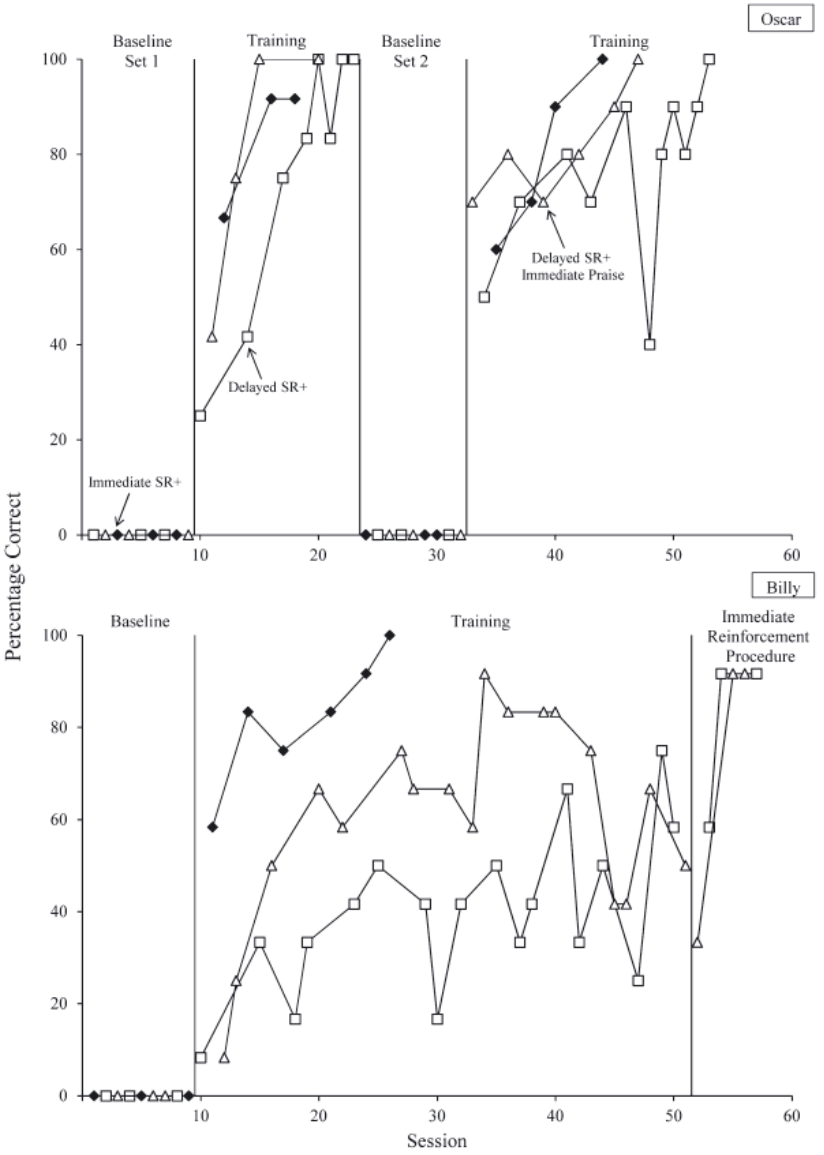
Effects of Reinforcer Delay on Acquisition

◆ Immediate SR+ (both praise and preferred item)

△ Immediate Praise; Delayed SR+ (10-s delay to preferred item)

☐ Delayed SR+ (10-s delay to both praise and preferred item)

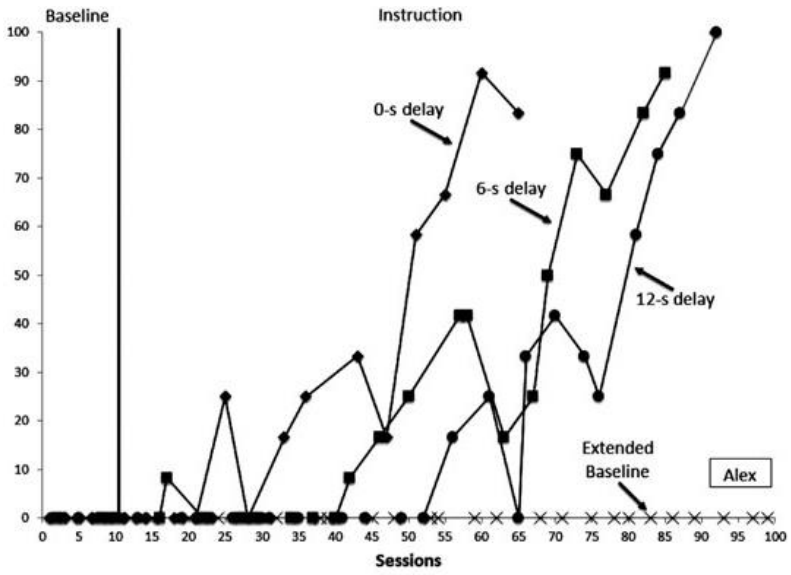
Result: Delays result in less rapid acquisition

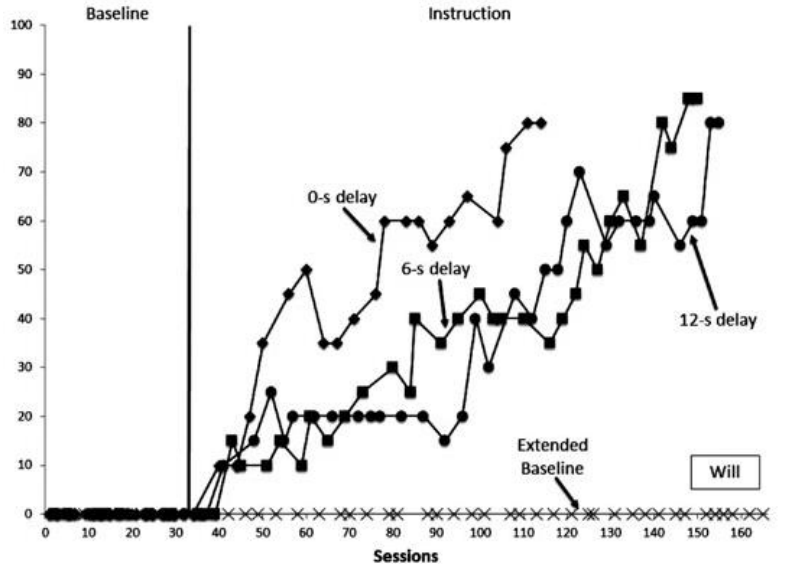


Carroll, Kodak, & Adolf (2016) Journal of Applied Behavior Analysis

Q: How much a delay is tolerable before detrimental effects are observed in acquisition?

- Parametric analysis of effects of delay to acquisition
- 3 children with ASD (2 shown)
- Discrete trials for mand acquisition
- Preferred edible + praise for correct responding with:
  - 0-second delay
  - 6-second delay
  - 12-second delay



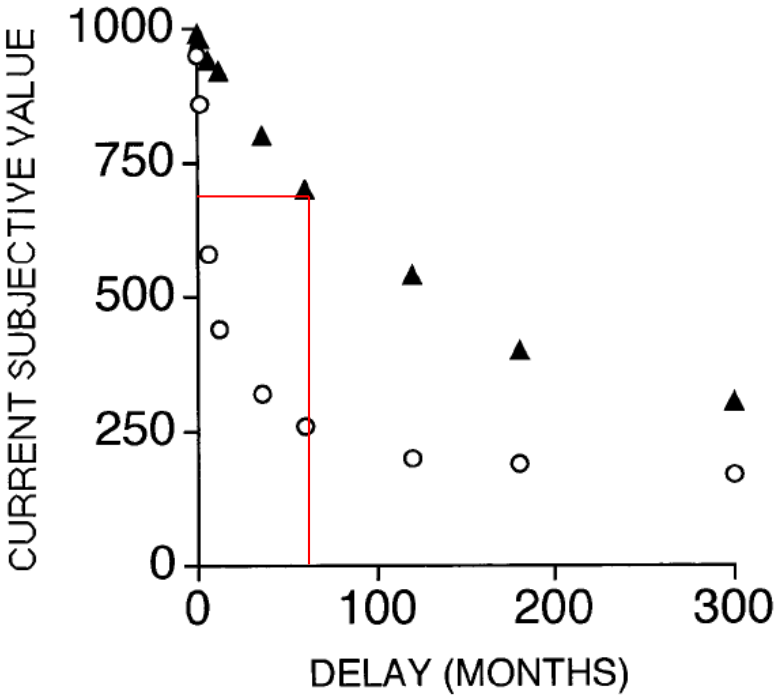


Majdalany, Wilder, Smeltz, & Lipschultz (2016) Journal of Applied Behavior Analysis

Delay Discounting

- *Delay discounting* - how the present subjective value of a given reward declines as the delay to its receipt increases

$1000 now or $1000 after 5 yrs?
$900 now or $1000 after 5 yrs?
$800 now or $1000 after 5 yrs?
$700 now or $1000 after 5 yrs?
$600 now or $1000 after 5 yrs?



- *Steeper discounting = value declines more rapidly given delays, immediacy is more important*
  - *Discounting of same commodity across differing populations*
  - *Discounting of different commodities in the same individual*

Delay Discounting

- *Delay discounting – the subjective value of money declines less steeply across delays than the subjective value of alcohol and food*

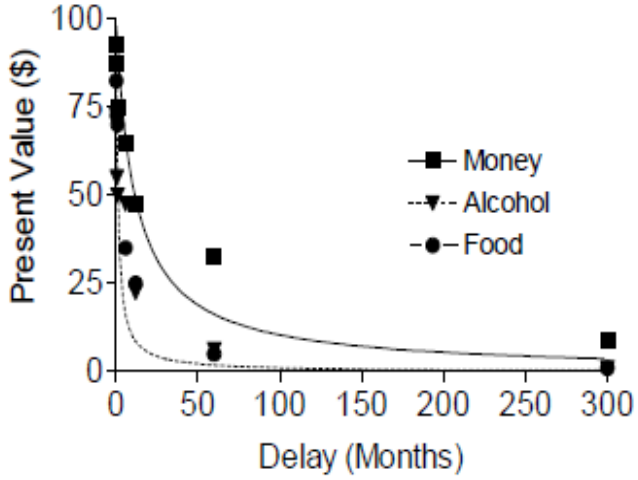


Fig. 1. Temporal discounting functions for money, alcohol, and food. Points show median indifference points as a function of delay. Lines show best-fitting discount functions generated by the hyperbolic model (Eq. (1), see text).

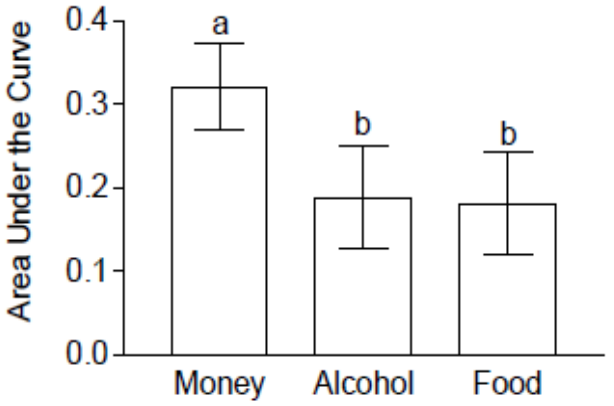
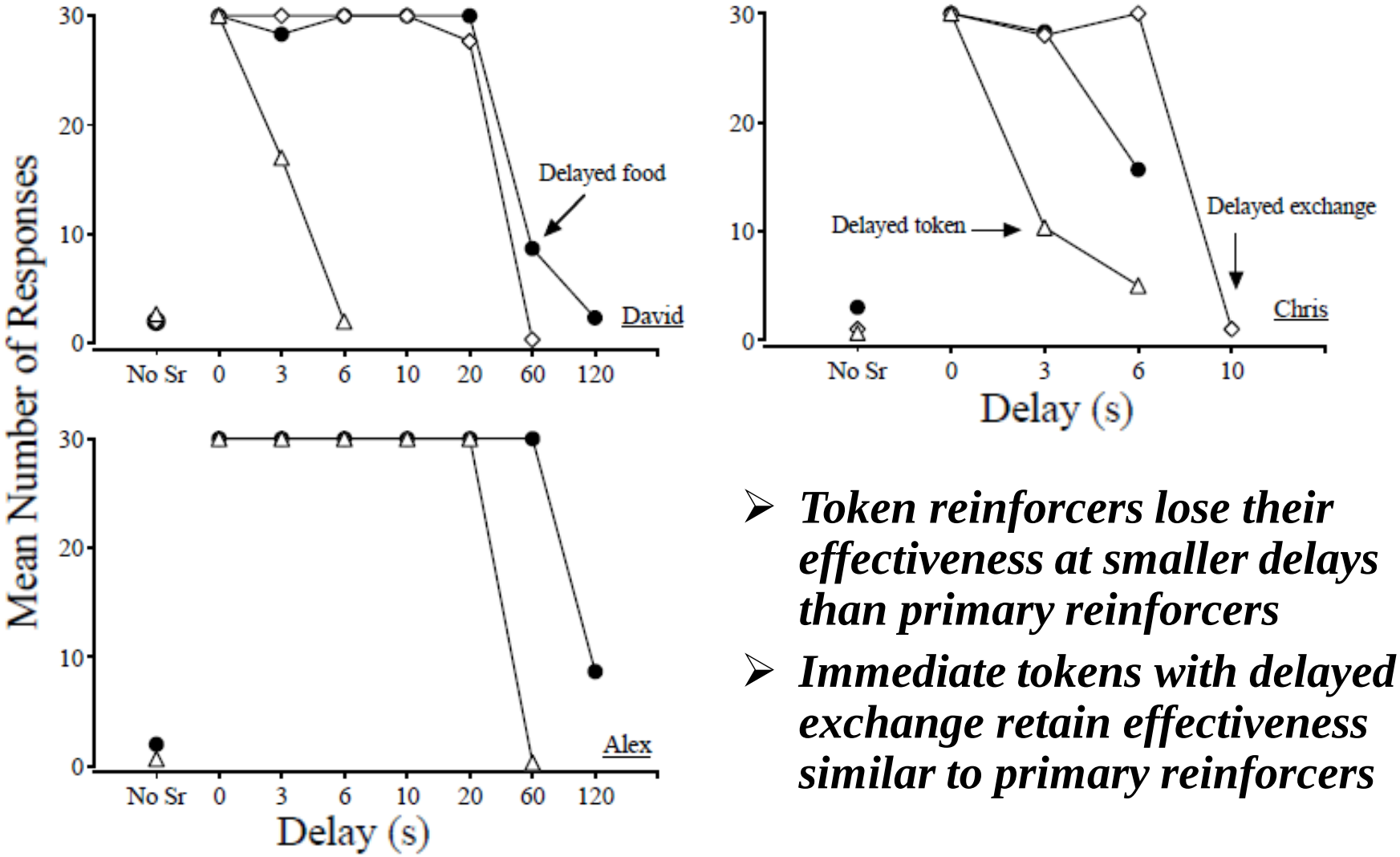


Fig. 2. Mean area under the curve for money, alcohol, and food. Vertical lines indicate one standard error above and below means. The means of conditions marked with the letter 'a' are significantly different from the means of conditions marked with the letter 'b'; the means of conditions marked with the letter 'b' are not significantly different from each other.

Odum & Rainaud (2003) Behavioral Processes

Q: How do delays impact the effectiveness of primary reinforcers vs tokens?



- ***Token reinforcers lose their effectiveness at smaller delays than primary reinforcers***
- ***Immediate tokens with delayed exchange retain effectiveness similar to primary reinforcers***

Leon, Borrero, & DeLeon (2016) Journal of Applied Behavior Analysis

Determinants of Value: Effort and Subsequent Value

- The relation between historical effort and subsequent value:
  - *The Law of Least Effort - all else being equal, organisms prefer options associated with less cost*
  - *But what happens later to those stimuli historically associated with greater effort?*

Contingency: Effort and Subsequent Value

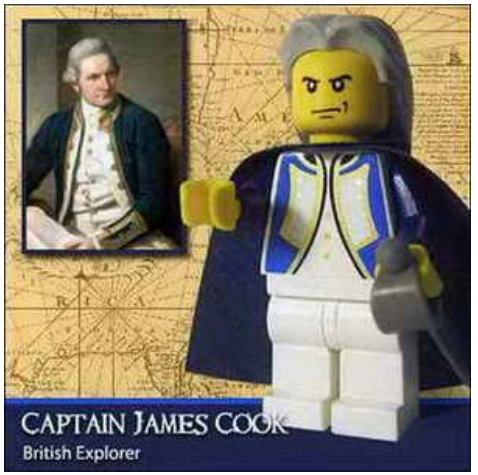
- *Possibility 1*
  - Stimuli historically associated with greater effort, by virtue of being paired with an aversive event (i.e. greater effort), lose value over time and experience
  - A negative relation between "how much one has to work" for a reinforcer and how it is subsequently valued

- *Possibility 2*
  - Stimuli historically associated with greater effort, once current effort is equated, are "on sale."
  - A positive relation between "how much one has to work" for a reinforcer and how it is subsequently valued

Contingency: Effort and Subsequent Value

"..such are the Tempers and dispossissions of Seamen in general that whatever you give them out of the common way, altho it be ever so much for their good yet it will not go down with them and you will hear nothing but murmurrings gainest the man that first invented it; but the Moment they see their superiors set a Value upon it, it becomes the finest stuff in the World and the inventor an honest fellow."

Captain James Cook , April, 1769



"The harder the conflict, the more glorious the triumph. What we obtain too cheap, we esteem too lightly."

Thomas Paine, *The Crisis*, 1776

Contingency: Effort and Subsequent Value

"The more you suffer, the more it shows you really care."

The Offspring, "Self-Esteem" (1995)

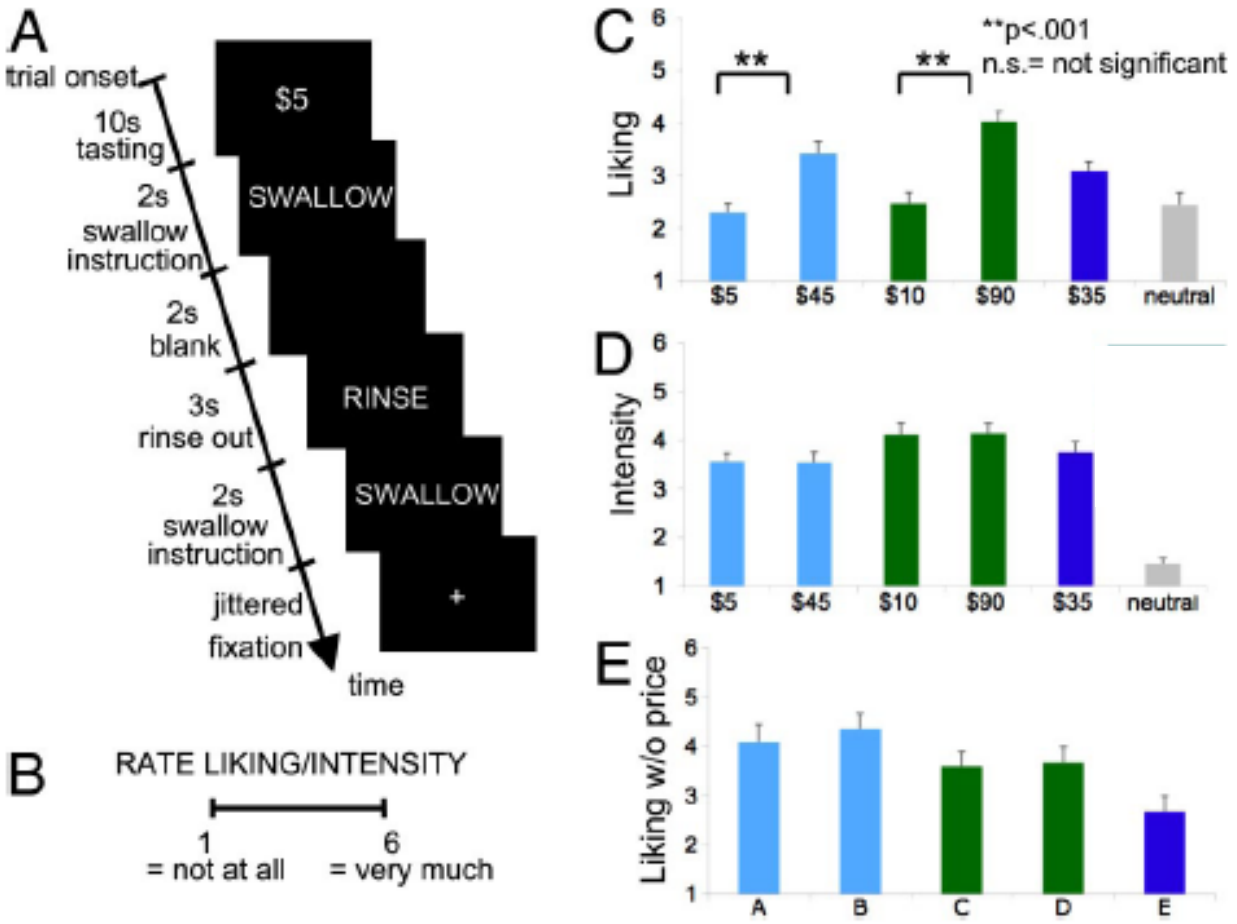


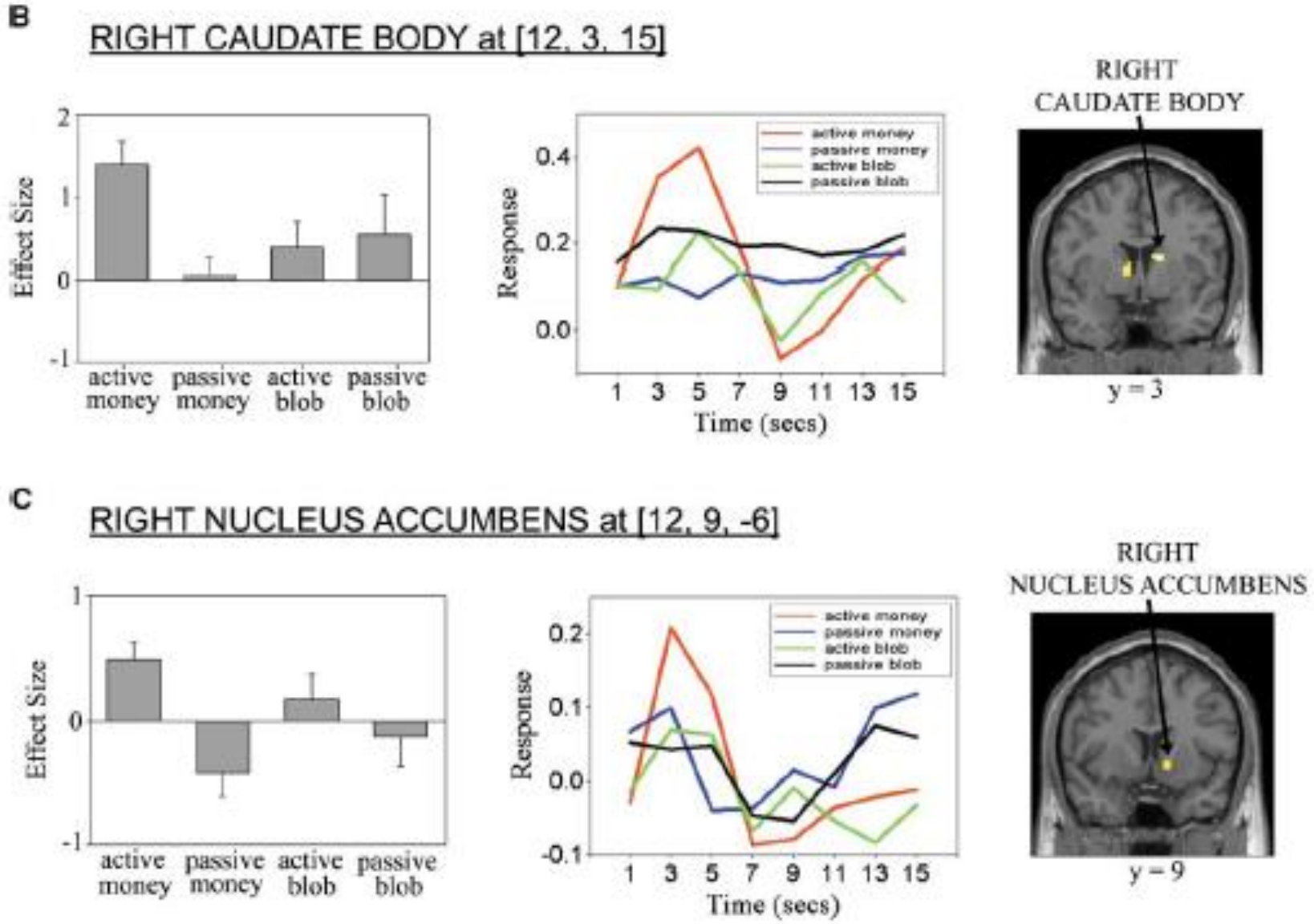
Fig. 1. Experimental design and behavioral results. (*A*) Time course for a typical trial. (*B*) Reported pleasantness and intensity rating scales. (*C*) Reported pleasantness for the wines during the cued price trials. (*D*) Taste intensity ratings for the wines during the cued price trials. (*E*) Reported pleasantness for the wines obtained during a postexperimental session without price cues.

Effort and Subsequent Value

Study: Brain Prefers Working for Cash

Posted: May 14, 2004 at 3:15 p.m.

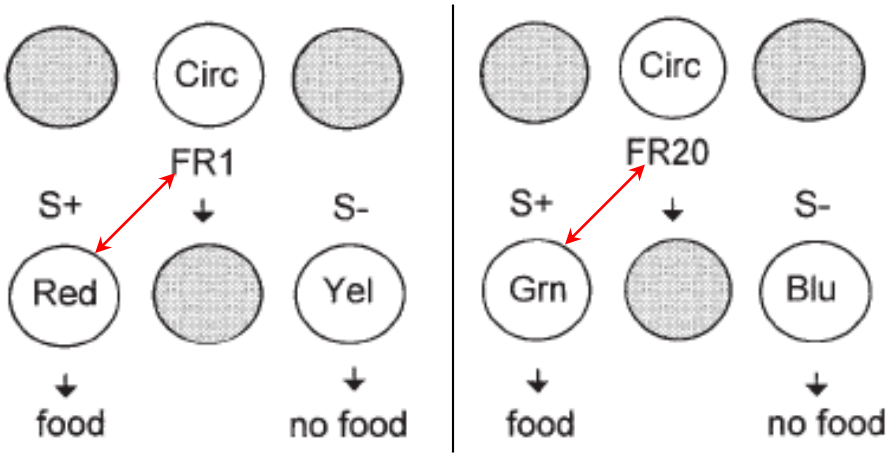
ATLANTA (AP) -- It's nicer when you actually earn it. Lottery winners, trust-fund babies and others who get their money without working for it do not get as much satisfaction from their cash as those who earn it, a study of the pleasure center in people's brains suggests. Emory University researchers **measured brain activity in the striatum — the part of the brain associated with reward processing** and pleasure — in two groups of volunteers. One group had to work to receive money while playing a simple computer game; the other group was rewarded without having to earn it. **The brains of those who had to work for their money were more stimulated.**



Zink, Pagnoni, Martin-Skurski, Chappelow, & Berns (2004) Neuron

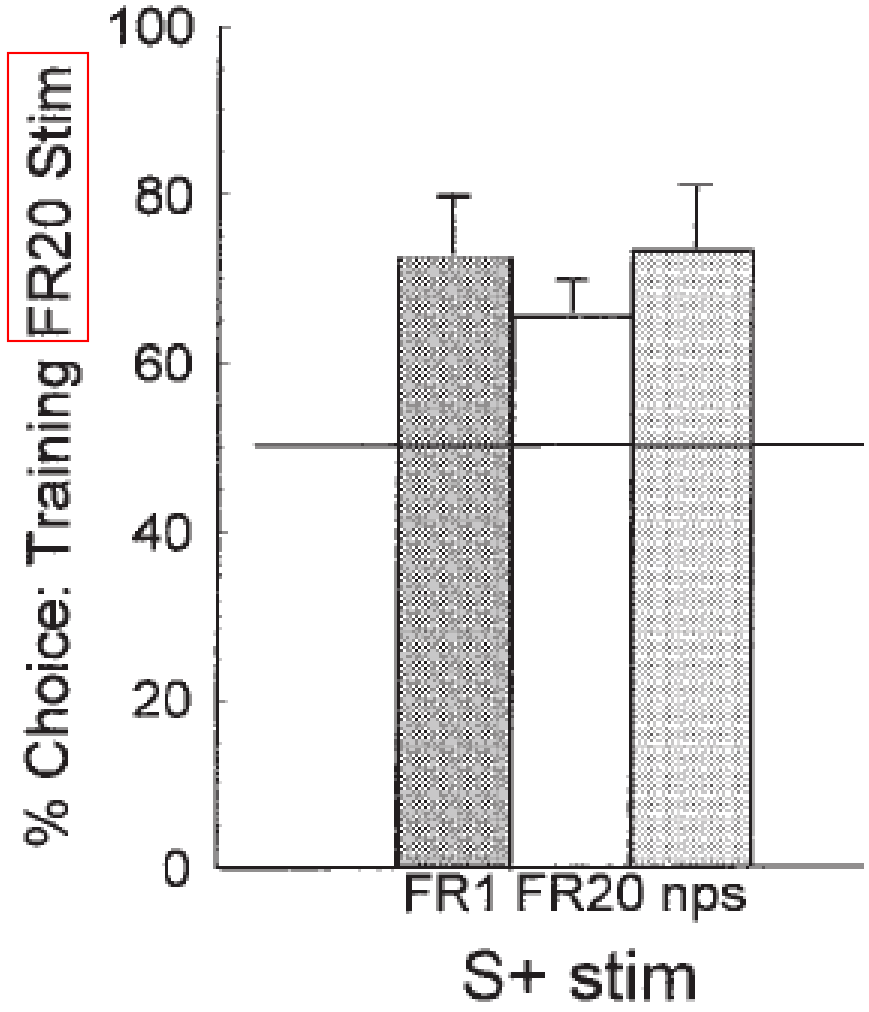
Effort and Subsequent Value

- Clement, Feltus, Kaiser, & Zentall (2000)
  - Pigeons exposed to chain schedules:
  - Training: Two types of trials (50% / 50%)



- Test: Concurrent choice, red S+ vs. green S+

Clement, Feltus, Kaiser, & Zentall (2000) Psychonomic Bulletin & Review



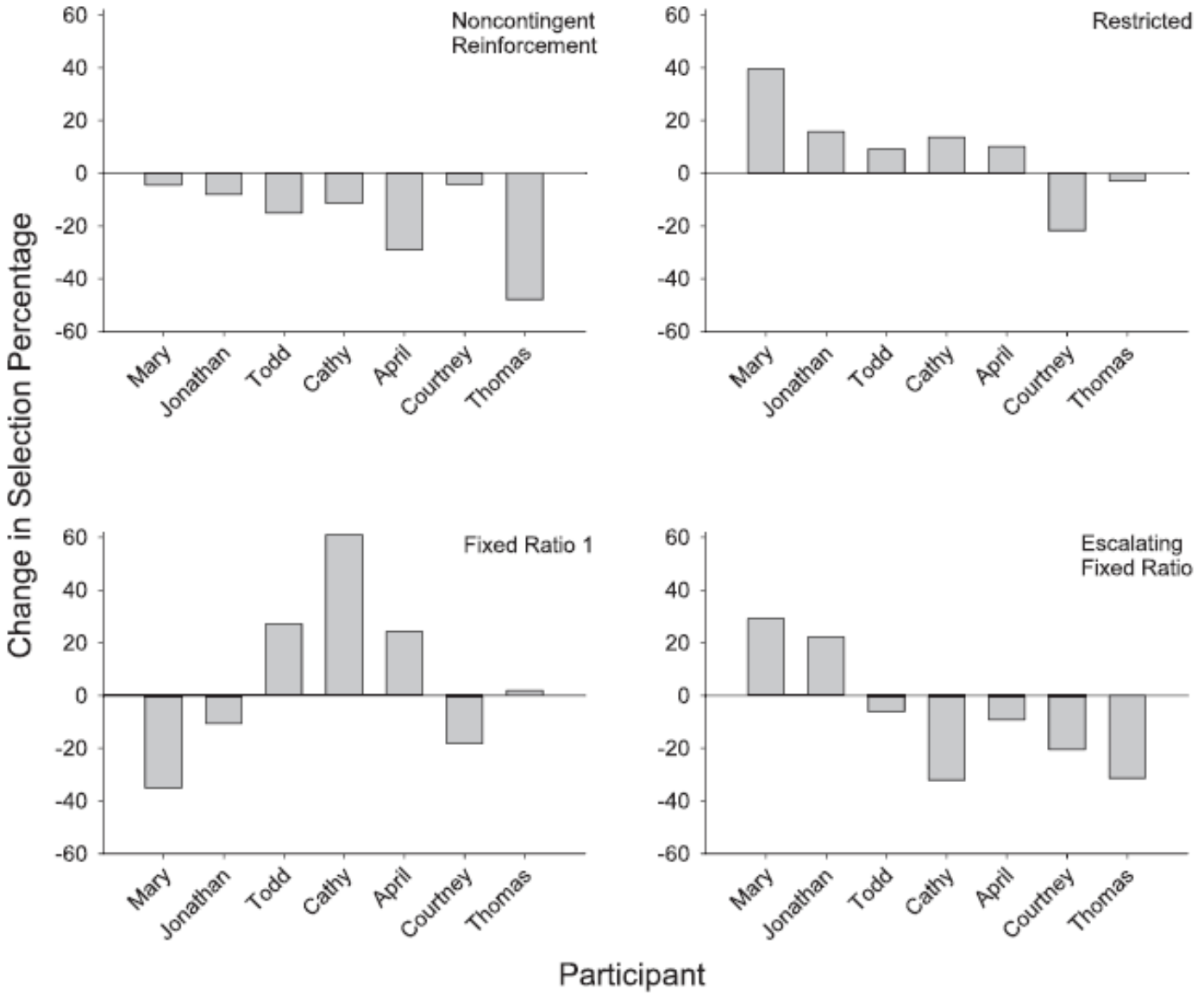
Clement, Feltus, Kaiser, & Zentall (2000) Psychonomic Bulletin & Review

Effort and Subsequent Value

Q: Does the amount of work required to earn a reinforcer alter the value of that reinforcer?

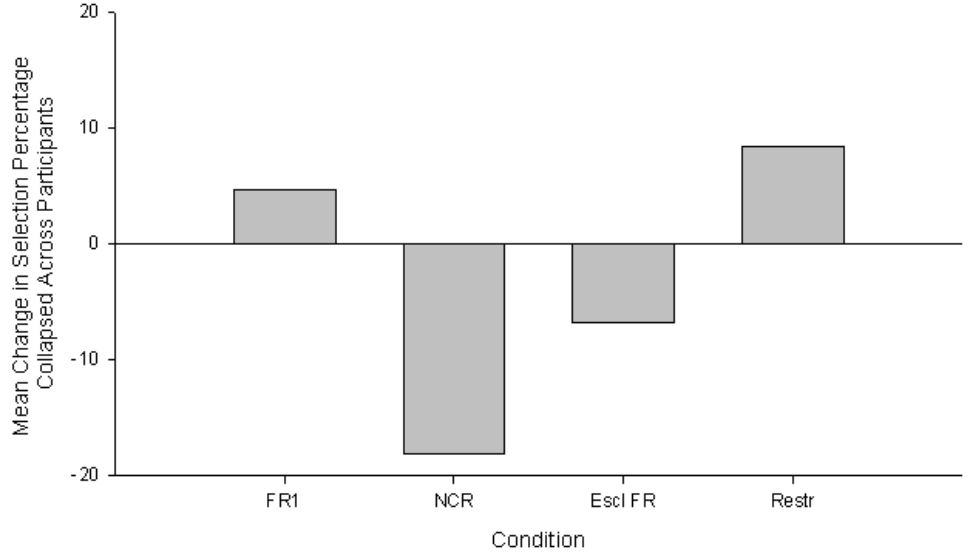
- *8 Children with ASD & MR (n = 8)*
- *Pre-test:*
  - *Preference assessment*
  - *Progressive-ratio schedule for 4 moderately preferred items*
- *Items assigned to one of four conditions for 4 weeks:*
  - *FR1 delivery for academic tasks*
  - *Escalating FR delivery for academic tasks*
  - *Yoked noncontingent delivery*
  - *Restricted*
- *Post-test: preference assessment and PR schedule analysis*

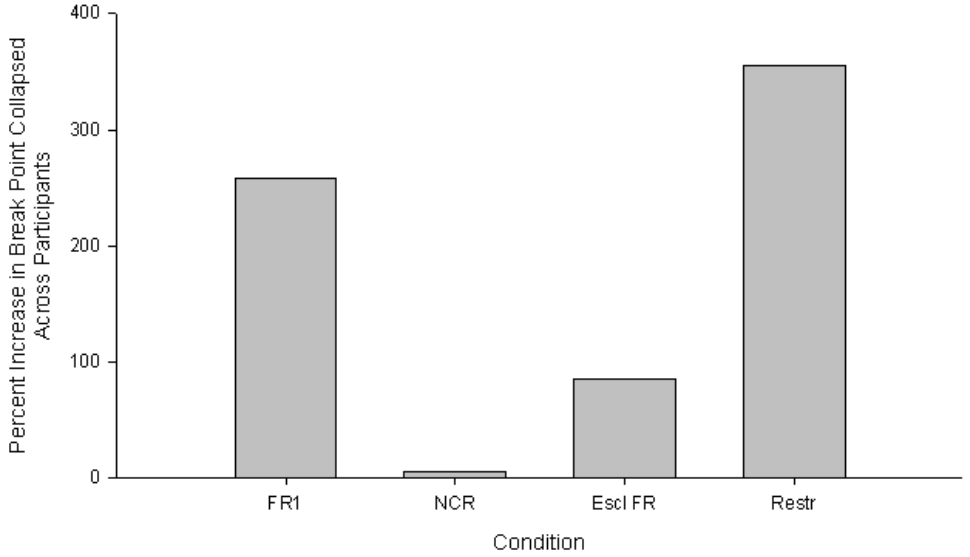
Determinants of Preference & Preference Change



DeLeon, Gregory, Frank-Crawford, Allman, Wilke, Carreau & Triggs (2011), Journal of Applied Behavior Analysis

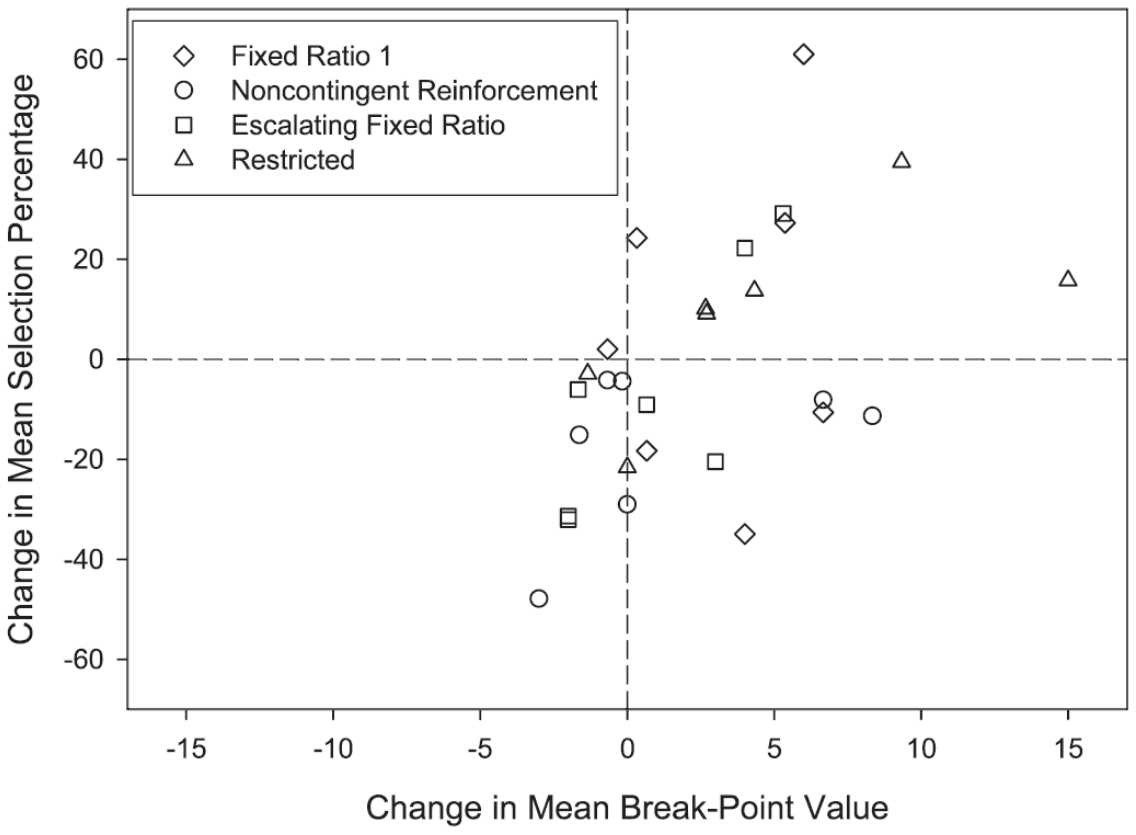
Effort and Subsequent Value





DeLeon, Gregory, Frank-Crawford, Allman, Wilke, Carreau & Triggs (2011), Journal of Applied Behavior Analysis

Effort and Subsequent Value



- Free reinforcers lose value more rapidly than earned reinforcers
- *Are interventions that involve contingent reinforcers more durable than interventions that involve noncontingent reinforcers?*
- *Is the loss of earned reinforcers more potent than the loss of free reinforcers?*

DeLeon, Gregory, Frank-Crawford, Allman, Wilke, Carreau & Triggs (2011), Journal of Applied Behavior Analysis

Effort and Subsequent Value

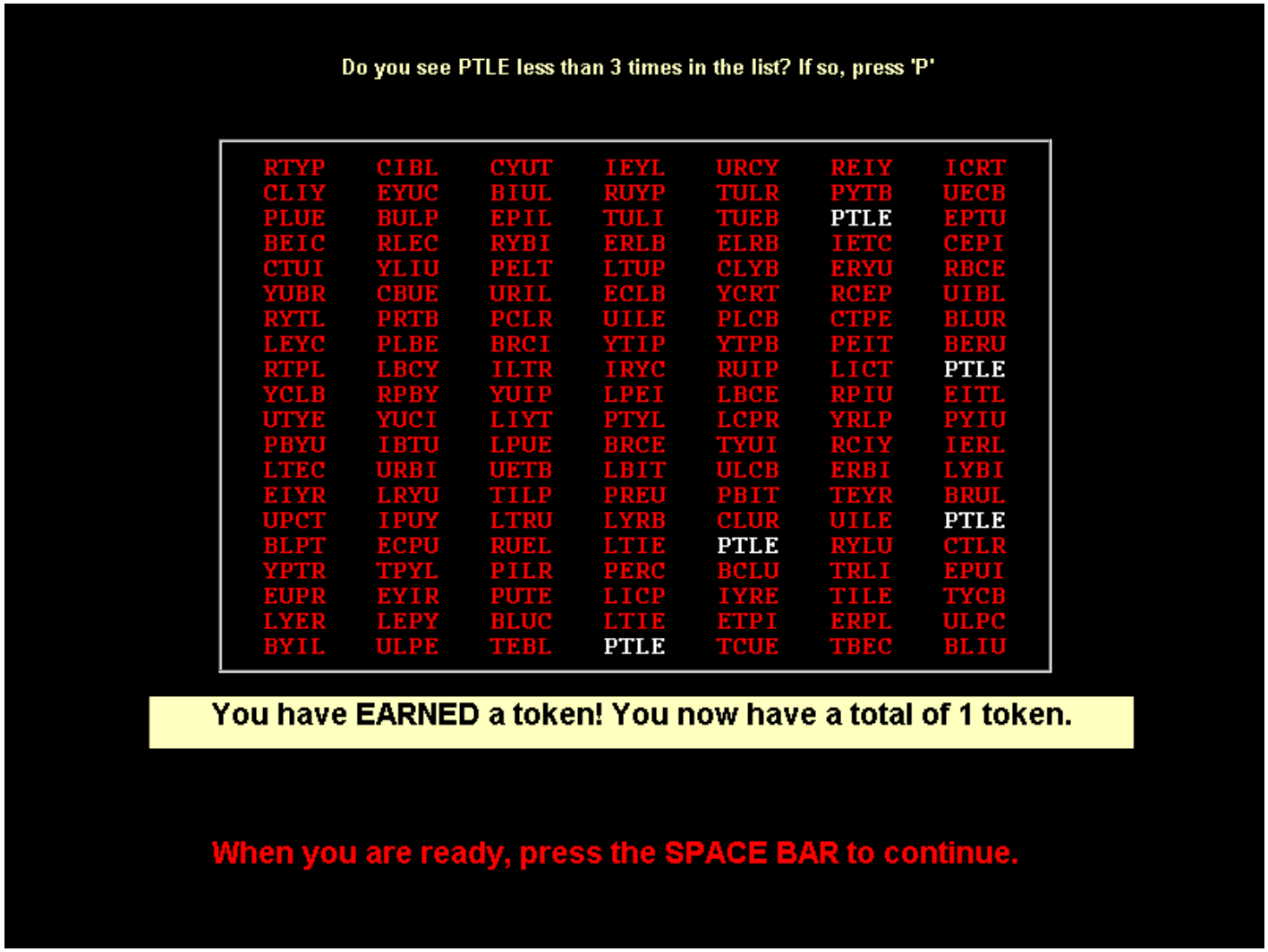
Q: If effort is positively correlated with subsequent value, is it more aversive to lose reinforcers that required greater effort to earn?

- *College students (n=28)*
- *Token Accumulation*
  - *Contingent group (n = 14):*
    - *Completes task to earn 20 tokens, later exchanged for $*
  - *Noncontingent group (n = 14)*
    - *20 tokens delivered freely on schedule yoked to earner*
- *Test of sensitivity to loss*

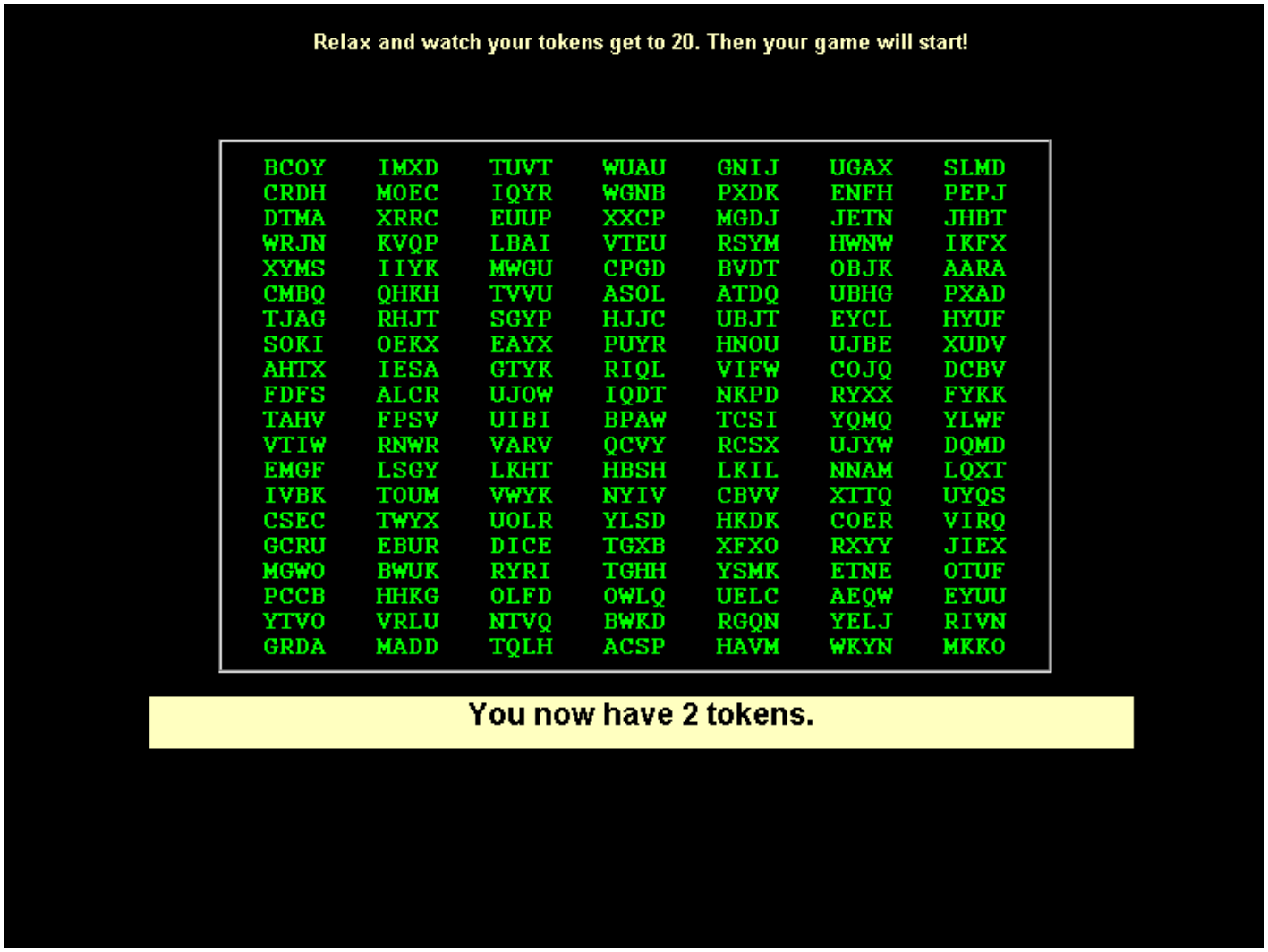
Earn Group

Do you see PTLE 3 or more times in the list? If so, press 'Q'
Do you see PTLE less than 3 times in the list? If so, press 'P'
You have 20 seconds from the time the array appears!
EBCR UCTE IEPY TUYP TLCY PRIL EBTC
TCBE YRLB TYEB RYPE IYLC LBTC TBPU
TLBU UCBP YBRU ICEB YUCL BRYP RYEI
TRBP ELIR ECTR CEYL LBPE LTIC RPTC
BUEY LITR ECRP PCRT TELU TCRE LETB
ITCP IUBP RELT TRPI PTLU PEUL RULB
ITPY TLUB PLBI PTLE RYLP RPYC TIYU
RYIC UCEL CRPY YCIP RLBP YRTL PUTI
PIEY LBYR TUPI UCBL PCYU PLRU ELUT
ICYU PTCB PTLE PITL UYPB IRPL IBLU
RCIB PBLI ILTP CYIT ECPU EUTI EULP
BYPE RCPI TBIL PTLE PTLE CLTR CTBL
PTLE PUTY CUIY BCPU UTCE BIRL CRIE
IBRY RTYU CTEL PTLE CBTR YBTE IBCY
IRLB BPIC LRTI LTEI LRYT UBPC EPYL
LUIC IBPC TUYB LITR ECPY ECPT RIPT
BUEY PRBE ILRC BYPE REYP PEBY TRUE
BYUE LRPE BUYC EYPC PUCB ELPI LTYR
YTPI YUTI TIYL TPUE REYC TREP IBPU
YIPR TILE YUER PUCY PTLE PBEC RTBU

Earn Group


Do you see PTLE less than 3 times in the list? If so, press 'P'
RTYP CIBL CYUT IEYL URCY REIY ICRT
CLIY EYUC BIUL RUYP TULR PYTB UECB
PLUE BULP EPIL TULI TUEB PTLE EPTU
BEIC RLEC RYBI ERLB ELRB IETC CEPI
CTUI YLIU PELT LTUP CLYB ERYU RBCE
YUBR CBUE URIL ECLB YCRT RCEP UIBL
RYTL PRTB PCLR UILE PLCB CTPE BLUR
LEYC PLBE BRCI YTIP YTPB PEIT BERU
RTPL LBCY ILTR IRYC RUIP LICT PTLE
YCLB RPBY YUIP LPEI LBCE RPIU EITL
UTYE YUCI LIYT PTYL LCPR YRLP PYIU
PBYU IBTU LPUE BRCE TYUI RCIY IERL
LTEC URBI UETB LBIT ULCB ERBI LYBI
EIYR LRYU TILP PREU PBIT TEYR BRUL
UPCT IPUY LTRU LYRB CLUR UILE PTLE
BLPT ECPU RUEL LTIE PTLE RYLU CTLR
YPTR TPYL PILR PERC BCLU TRLI EPUI
EUPR EYIR PUTE LICP IYRE TILE TYCB
LYER LEPY BLUC LTIE ETPI ERPL ULPC
BYIL ULPE TEBL PTLE TCUE TBEC BLIU
You have EARNED a token! You now have a total of 1 token.
When you are ready, press the SPACE BAR to continue.

Free Group


Relax and watch your tokens get to 20. Then your game will start!
BCOY IMXD TUVT WUAU GNIJ UGAX SLMD
CRDH MOEC IQYR WGNB PXDK ENFH PEPJ
DTMA XRRC EUUP XXCP MGDJ JETN JHBT
WRJN KVQP LBAI VTEU RSYM HWNW IKFX
XYMS IIYK MWGU CPGD BVDT OBJK AARA
CMBQ QHKH TVVU ASOL ATDQ UBHG PXAD
TJAG RHJT SGYP HJJC UBJT EYCL HYUF
SOKI OEKX EAYX PUYR HNOU UJBE XUDV
AHTX IESA GTYK RIQL VIFW COJQ DCBV
FDFS ALCR UJOW IQDT NKPD RYXX FYKK
TAHV FPSV UIBI BPAW TCSI YQMQ YLWF
VTIW RNWR VARV QCVY RCSX UJYW DQMD
EMGF LSGY LKHT HBSH LKIL NNAM LQXT
IVBK TOUM VWYK NYIV CBVV XTTQ UYQS
CSEC TWYX UOLR YLSD HKDK COER VIRQ
GCRU EBUR DICE TGXB XFXO RXYY JIEX
MGWO BWUK RYRI TGHH YSMK ETNE OTUF
PCCB HHKG OLFD OWLQ UELC AEQW EYUU
YTVO VRLU NTVQ BWKD RGQN YELJ RIVN
GRDA MADD TQLH ACSP HAVM WKYN MKKO
You now have 2 tokens.

Effort and Subsequent Value

Test of Sensitivity to Loss

- *Variation of the "Miami Door-Opening Task" (Daugherty & Quay, 1991)*
- *2 responses:*
  - *Response "D": Open the chest – produces either:*
    - *Another token*
    - *Loss of one token; ratio of gains to losses decreases across blocks of 10 trials*
  - *Response "K": Cash out*
- *Primary D.V.: How many A responses before cashing out?*

Press 'D' to open the chest. Press 'K' to end your session and cash out your tokens!

You can now receive more tokens by opening the chest. Each time that you open it, there is a chance to GAIN or LOSE a token.

You have GAINED a token!

When you are ready, press the SPACE BAR to continue.

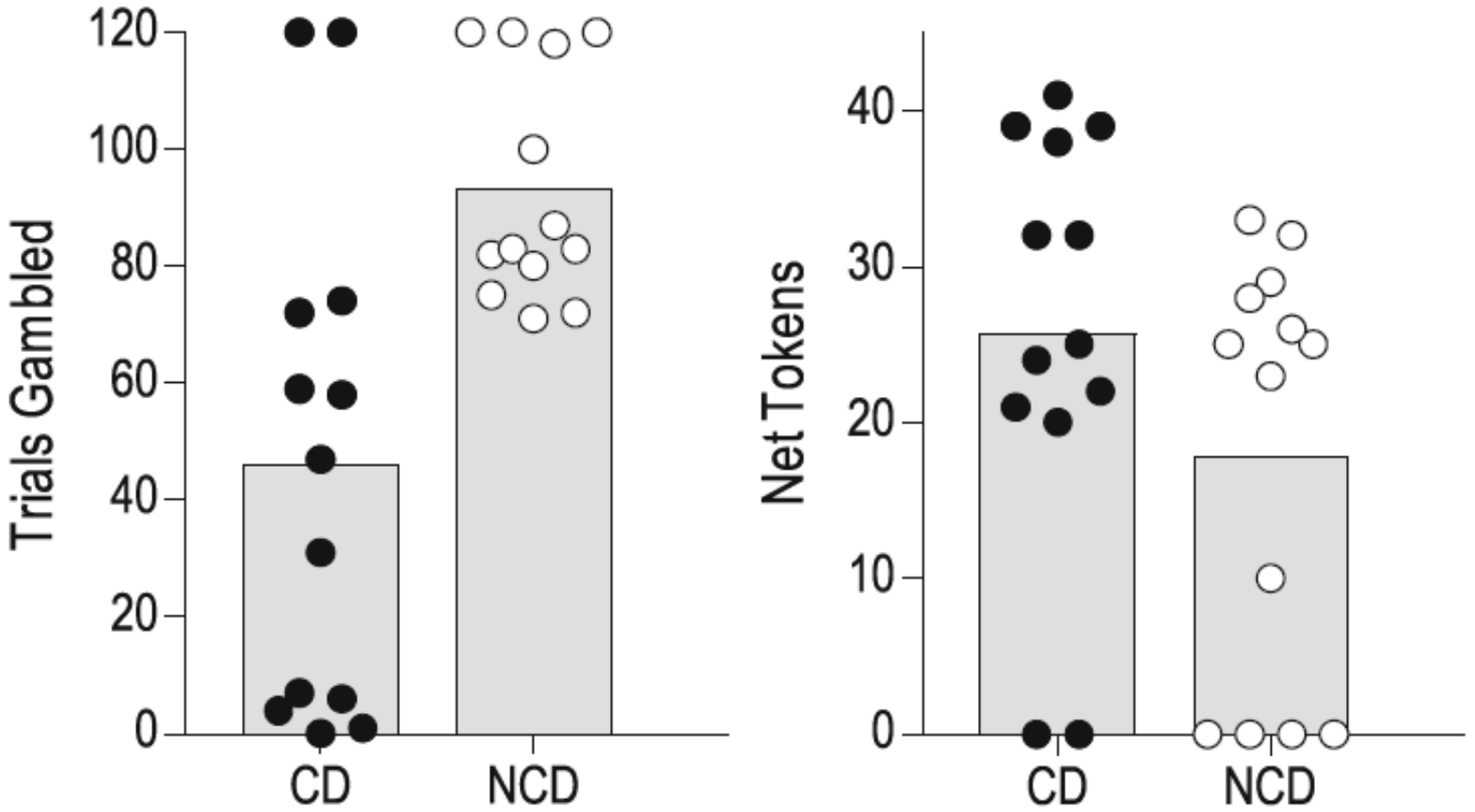


Fig. 1 Number of trials gambled (left panel) and net tokens (right panel) for contingent delivery (CD) and noncontingent delivery (NCD) participants in Phase 2. Each circle represents a value for one participant; the bars represent the group mean

Overall Results

- Earners were more sensitive to token loss

- Same effects obtained across all manipulations of effort and value – a robust effect
  - *Differences in token value*
  - *Differences in level of effort*

- Sensitivity in college students; less in children with IDD
  - *Discrepancy related to earned vs. lost reinforcers?*
  - *Effects dependent on ability to form rules?*

Grand conclusions

- Economic analyses tell us:
  - *Despite initial appearances, not all reinforcers "perform" equally*
  - *"Value" (reinforcer effectiveness) is not an inherent or static property of the stimulus; it depends critically on context*
    - *What else is available?*
    - *How is the opportunity to consume arranged?*
    - *How has it been used historically?*
  - *These relations can have meaningful implications, on the individual level, in applied contexts*

Behavioral Economics Overviews

Hursh, S.R., Madden, G.J., Spiga, R., DeLeon, I.G., & Francisco, M. T. (2013). The translational utility of behavioral economics: The experimental analysis of consumption and choice. In G. Madden, W.V. Dube, G. Hanley, T. Hackenberg, and K.A. Lattal (Eds.) *American Psychological Association Handbook of Behavior Analysis*. Washington, DC: American Psychological Association.

Reed, D.D, Nileksela, C.R., & Kaplan, B.A. (2013). Behavioral economics: A tutorial for behavior analysts in practice. *Behavior Analysis in Practice*, *6*, 34-54

Francisco, M. T., Madden, G.J., Borrero, J.B. (2009) Behavioral economics: Principles, procedures, and utility for applied behavior analysis. *The Behavior Analyst Today*, *10*, 277-294.

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