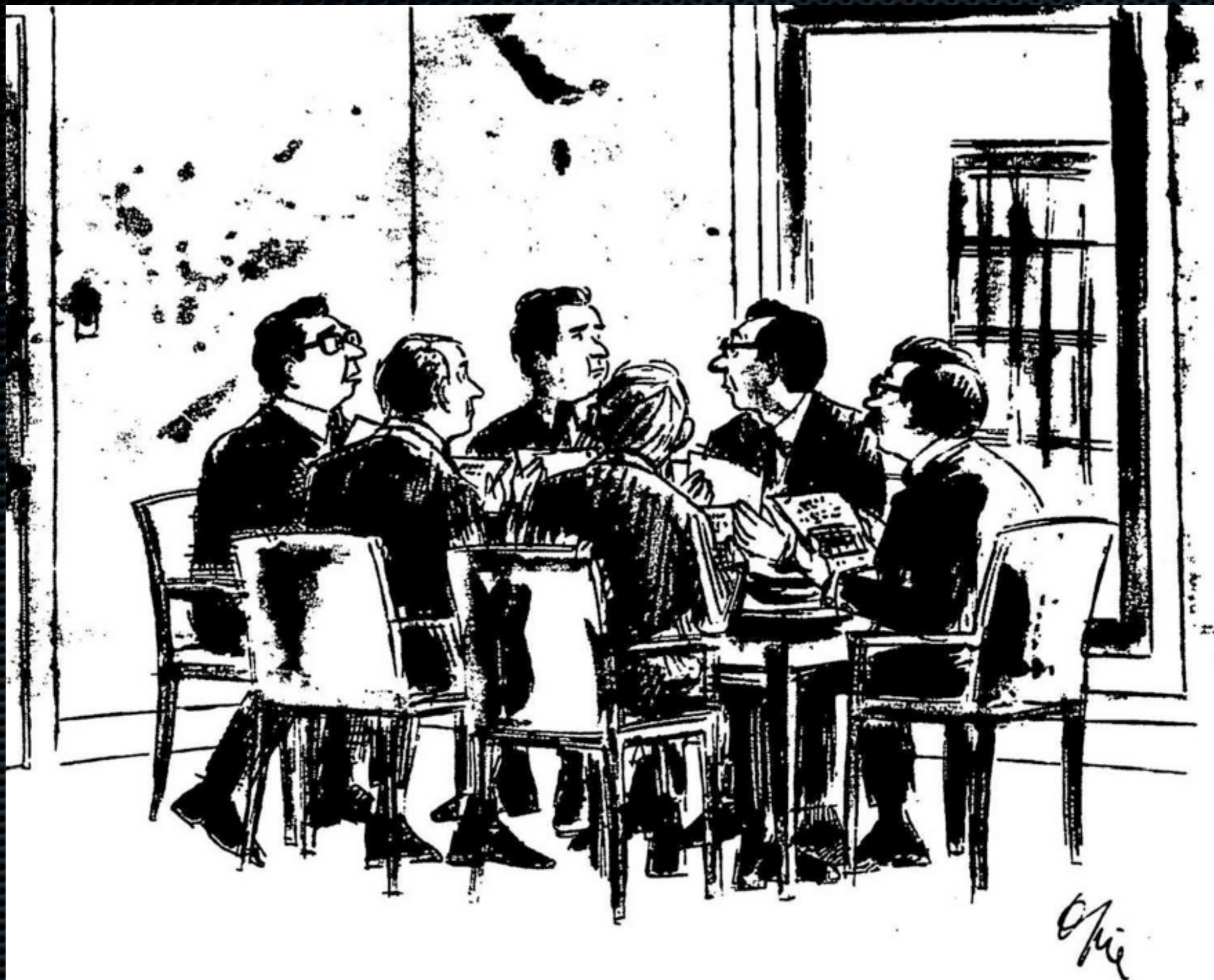


combine cost and outcome info

combine cost and
outcome info



"McGuire, what's with you? Everybody else here seems to have a perfectly clear idea of what 'cost effectiveness' means."

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Analyses

- Cost-Effectiveness Analysis (CEA)
- Cost-Benefit Analysis (CBA)
- Cost → Procedure → Process → Outcome Analysis (CPPOA)
- Resource → Activity → Process → Outcome Analysis (RAPOA)

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statistical analysis for ...

- descriptive of the resources → outcomes relationship
- graphs (Siebert & Yates): can develop equations (obesity Tx graph)
- cost/pound (wt loss bar graphs)
- cost/cure, cost/QALY
- Time to Return On Investment (TROI) (benefit = cost ...)

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- inferential (also descriptive of resources → outcomes)
- nonparametric tests of cost-outcome indices
- transformations for benefit data....
- parametric tests of cost-outcome indices

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Cost-Effectiveness Analysis

- “What does this program accomplish relative to its cost?”

Examples:

- cost per drug-free day
- cost per child prevented from smoking
- cost per year of life saved
- cost per quality-adjusted life year (\$/QALY)

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Cost-Benefit Analysis

- “Is the cost of this program justified relative to its outcome?” ... “Is this a good investment?”

Examples:

- ratio of dollars spent for therapy versus dollars saved in reduced unnecessary use of health services
- net benefit (after subtracting costs) of diversion program for homeless adults (reduced Emergency Room, jail)

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Ratio, e.g., Benefit/Cost

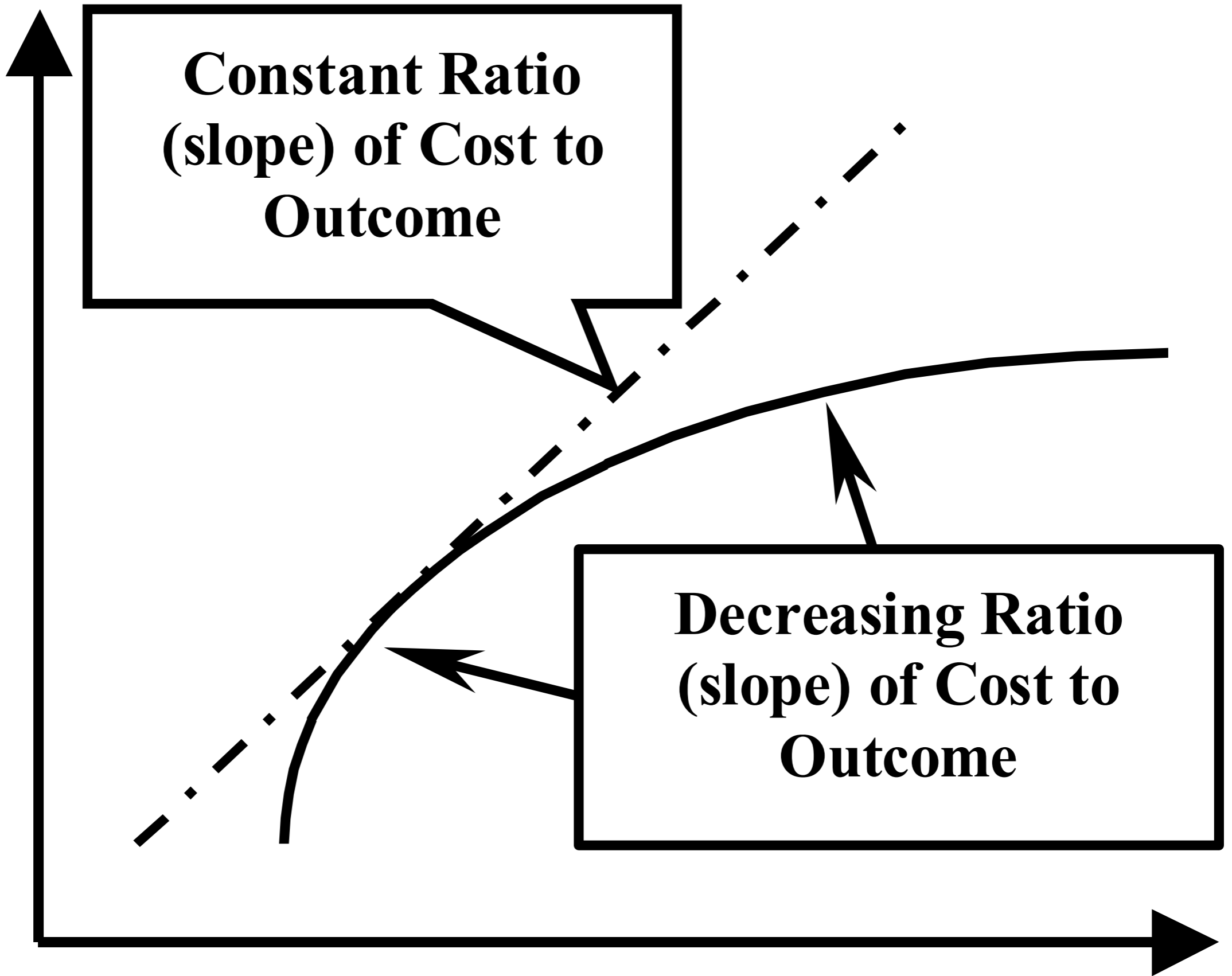
- advantages: simple, memorable, “understandable”
- problems:
 - ratios are, essentially, slopes
 - assumes a linear cost \rightarrow outcome relationship
 - discards info on:
 - diminishing returns
 - economies of scale
 - step functions

Outcome

**Constant Ratio
(slope) of Cost to
Outcome**

**Decreasing Ratio
(slope) of Cost to
Outcome**

Cost



units for benefits and costs need to be the same ...

- but they do not have to be monetary!
- NNT (Number Needed to Treatment ... for one person to benefit): David Newman
 - "benefit > harm"? "harm" \equiv ?
 - antibiotics?
 - 1 in 4 infections prevented
 - 1 in 22 lives saved
 - <http://www.thennt.com>

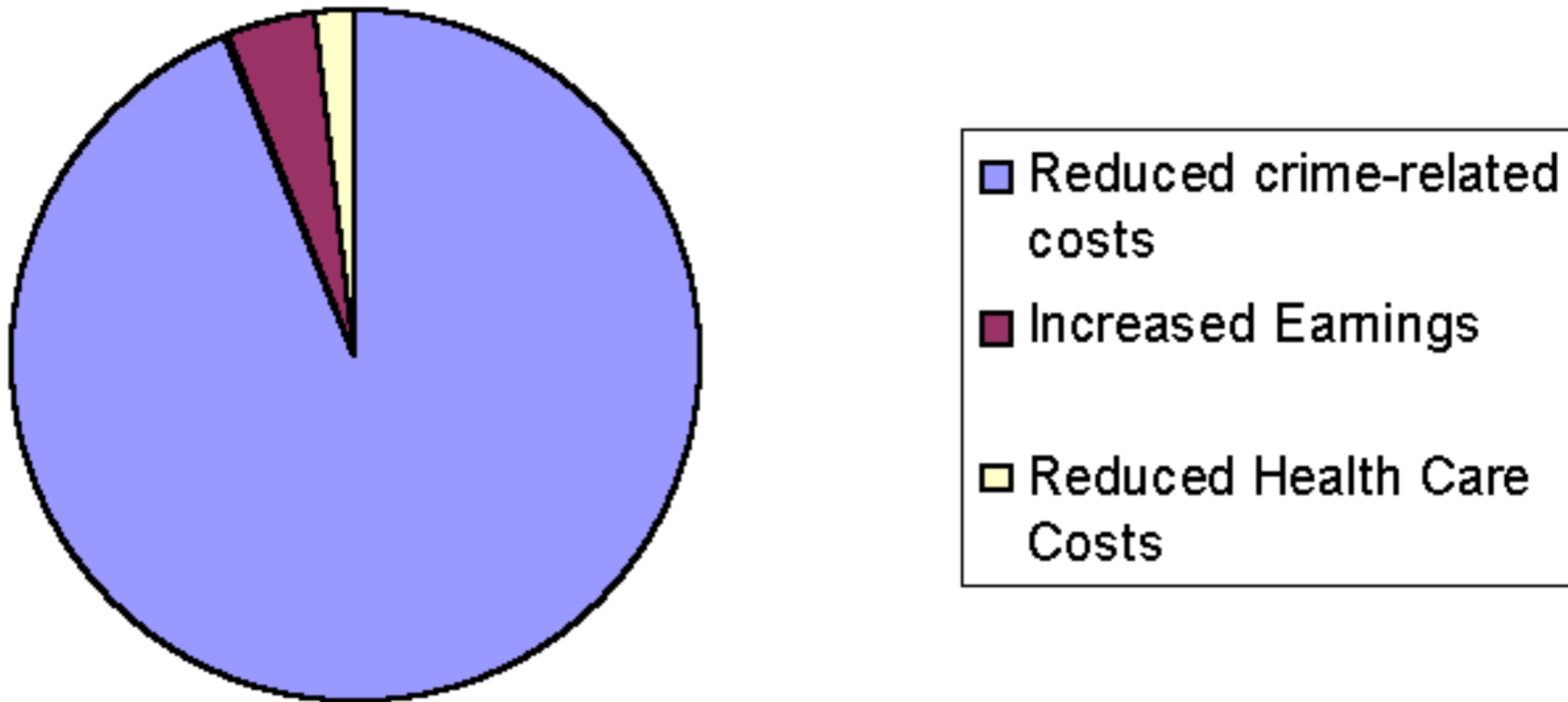
SUBJECTIVE COSTS AND BENEFITS OF SELECTED OBESITY REDUCTION STRATEGIES

<i>Obesity Reduction Strategy</i>	<i>Perceived "Difficulty"</i>		<i>Perceived "Usefulness"</i>	
	<i>Mean</i>	<i>s.d.</i>	<i>Mean</i>	<i>s.d.</i>
Eating Only in Designated Eating Place	4.6	(3.1)	7.3	(3.0)
Reducing Number of Eating Episodes	5.1	(3.3)	8.5	(2.4)
Reducing Number of Snacks	6.4	(3.1)	8.9	(2.0)
Eating at Regular Times	4.8	(3.5)	7.5	(3.1)
Graphing Weight	1.8	(1.5)	5.8	(3.3)
Leaving Some Food on Plate	7.3	(3.4)	6.9	(3.2)
Shopping for Food from a List	3.0	(2.8)	7.8	(2.9)
Keeping a Food Diary	4.2	(2.9)	8.5	(2.5)
Counting Calories and Choosing Foods Lowest in Calories	5.4	(3.2)	8.4	(2.6)
Imposing a Delay Between an "Urge" to Eat and Eating	7.1	(3.2)	8.0	(2.6)
Keeping Foods in Kitchen and in "See-Proof" Containers	2.9	(2.6)	6.1	(3.4)

NOTE. "s.d." = standard deviation. Adapted from Yates (1978).

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Cost-Savings from Substance Abuse Treatment (NTIES)



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If Benefits < Costs?

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and outcome
info



Cost Of Living Now Outweighs Benefits

APRIL 13, 2005 | ISSUE 41-15

WASHINGTON, DC—A report released Monday by the Federal Consumer Quality-Of-Life Control Board indicates that the cost of living now outstrips life's benefits for many Americans.

 ENLARGE IMAGE



"This is sobering news," said study director Jack Farness. "For the first time, we have statistical evidence of what we've suspected for the past 40 years: Life really isn't worth living."

To arrive at their conclusions, study directors first identified the average yearly costs and benefits of life. Tangible benefits such as median income

(\$43,000) were weighed against such tangible costs as homeownership (\$18,000). Next, scientists assigned a financial value to intangibles such as finding inner peace (\$15,000), establishing emotional closeness with family members (\$3,000), and brief moments of joy (\$5 each). Taken together, the study results indicate that "it is unwise to go on living."

"Since 1965, the cost-benefit ratio of American life has been approaching parity," Farness said. "While figures prior to that date show that life was worth living, there is some suspicion that the benefits cited were superficial and misreported."

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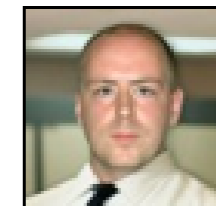
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JUNE 3, 1998

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SROI

Social Return On Investment

“The concept is simple: pay providers after they have demonstrated success, not based on the promise of success, as is done now.”

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Pay for Success

- <http://www.whitehouse.gov/omb/factsheet/paying-for-success>
- “*Pay for success bonds* engage philanthropic and private sector investors to deliver better outcomes”
- “*Pay for success bonds* can help achieve better outcomes in many program areas”
- “*Pay for success bonds* support better outcomes for federal, state, and local governments”

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actual \$?

\$100 million in budget for 2012 fiscal year in

- Dept of Education
- Social Security Administration
- Dept of Justice
- Dept of Labor
- Corporation for National and Community Services

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foci:

- workforce development
- education
- juvenile justice
- care of children with disabilities
- 3 more areas

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likely candidates for success bond financing:

- reduce offender recidivism ... with multi-systemic therapies
- reduce expensive long-term special ed programs... with early interventions for children with mild learning or behavioral problems
- maintain academic gains of disadvantaged students over the summer by summer academic programs
- reduce costly nursing home care for elderly ... with community-based elder care
- help young adults enter college and get better jobs ... by transition services for youth with disabilities

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Examples of cost-inclusive evaluations done ...

- cost-effectiveness analysis
- cost-benefit analysis
- cost-utility analysis

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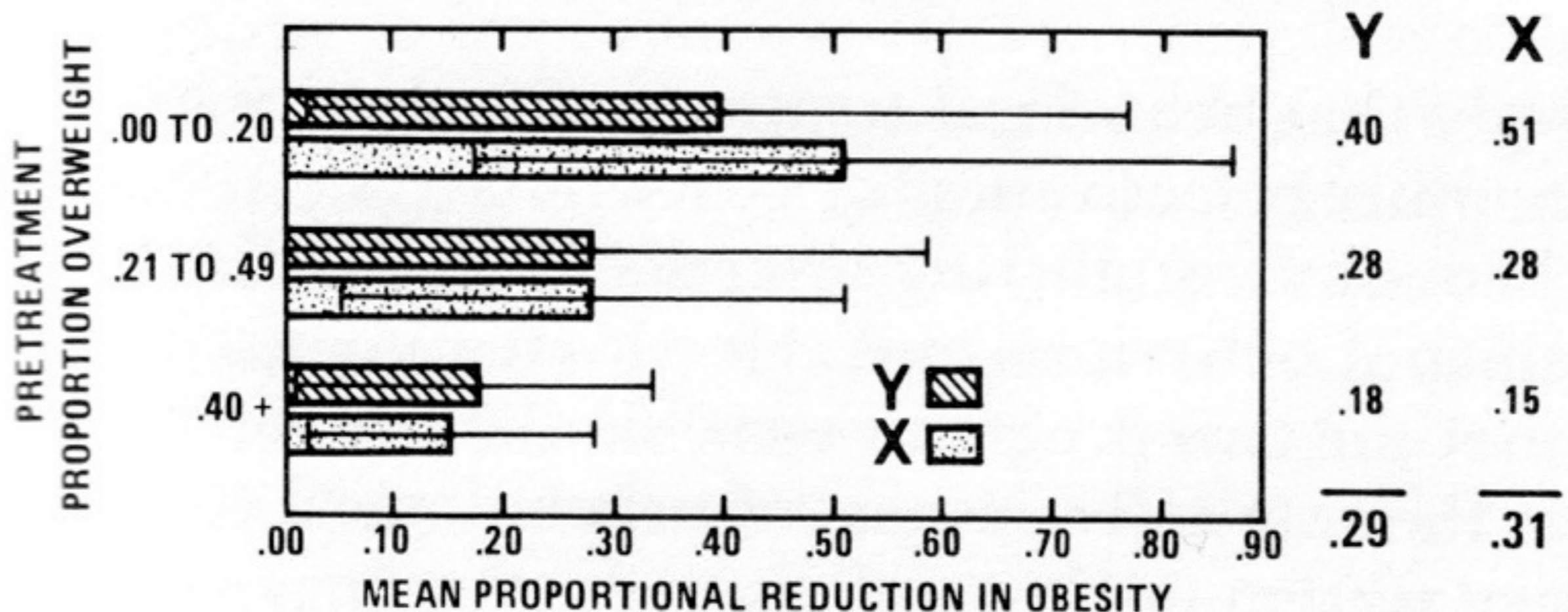
Weight loss treatments

Yates, B.T. (1977). Improving the cost-effectiveness of obesity programs: three basic strategies for reducing the cost per pound. *International Journal of Obesity*, 2, 249-266.

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Treatments Y and X ...

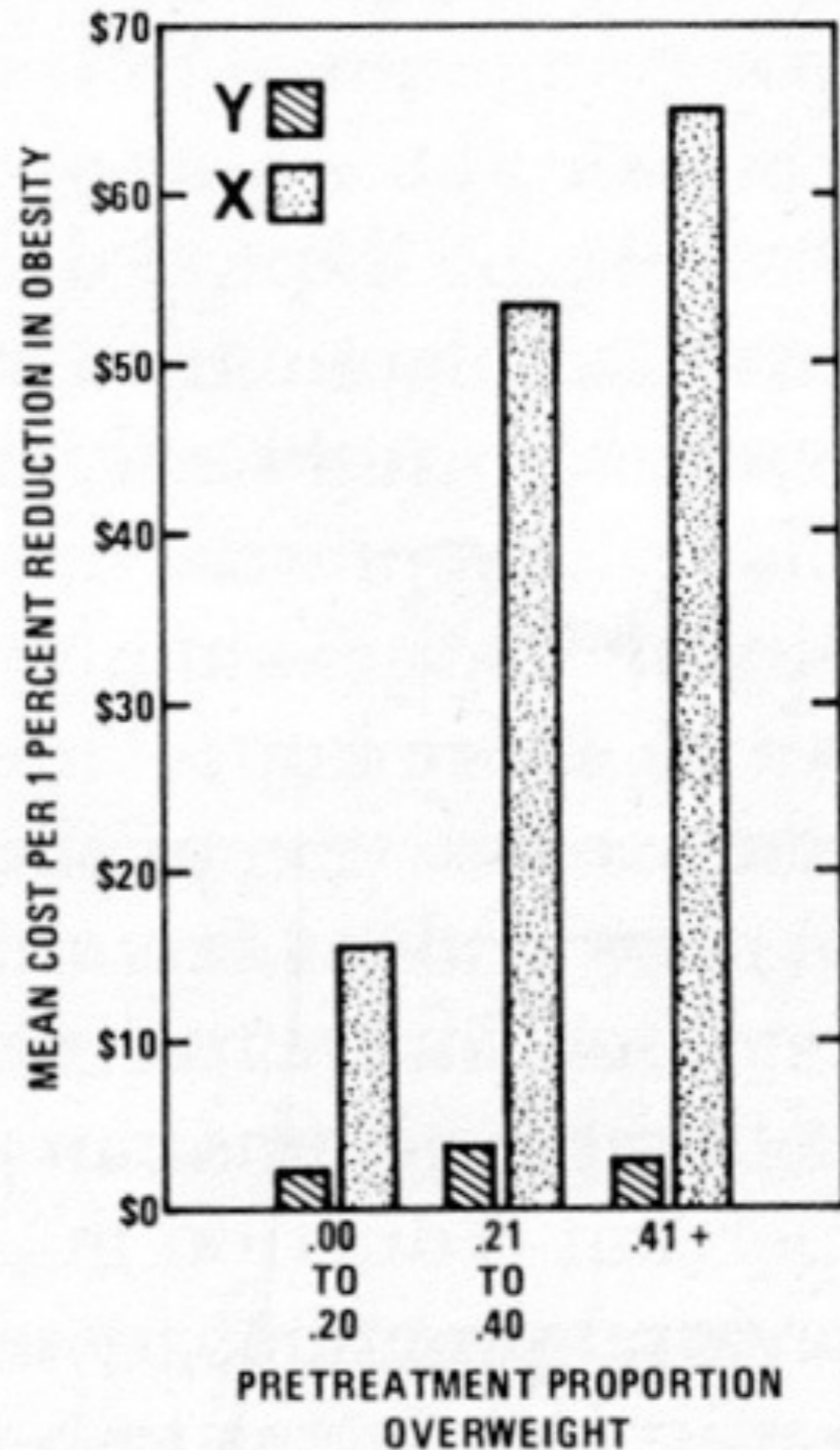
Effectiveness: $Y = X$



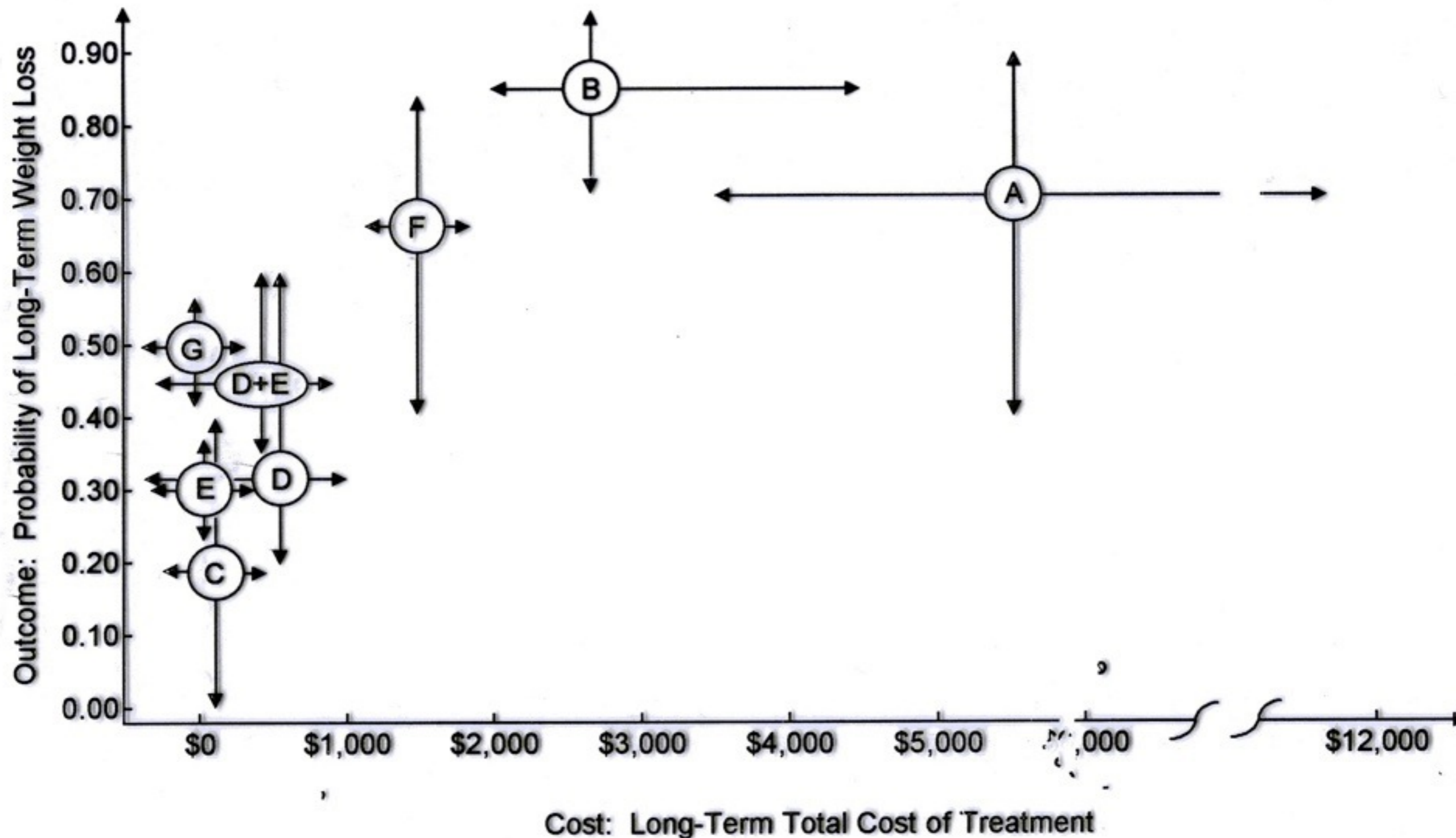
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Cost:

$X > Y$



Cost → Outcome Areas, Estimates (a 2-hour COA!)



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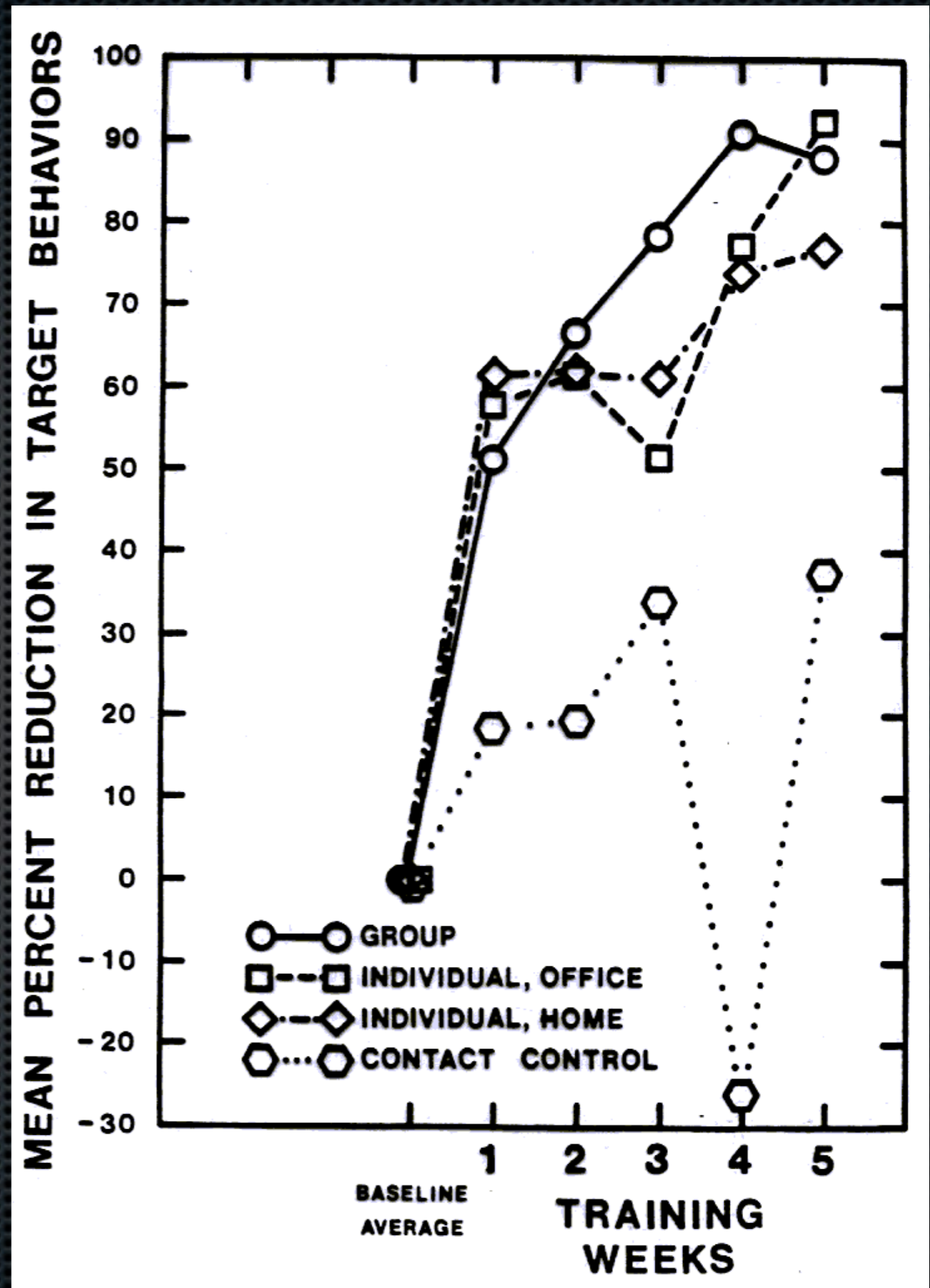
Child-Management Training

Siegert, F.A., & Yates, B.T. (1980). Cost-effectiveness of individual in-office, individual in-home, and group delivery systems for behavioral child-management. *Evaluation and the Health Professions*, 3, 123-152.

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outcome info

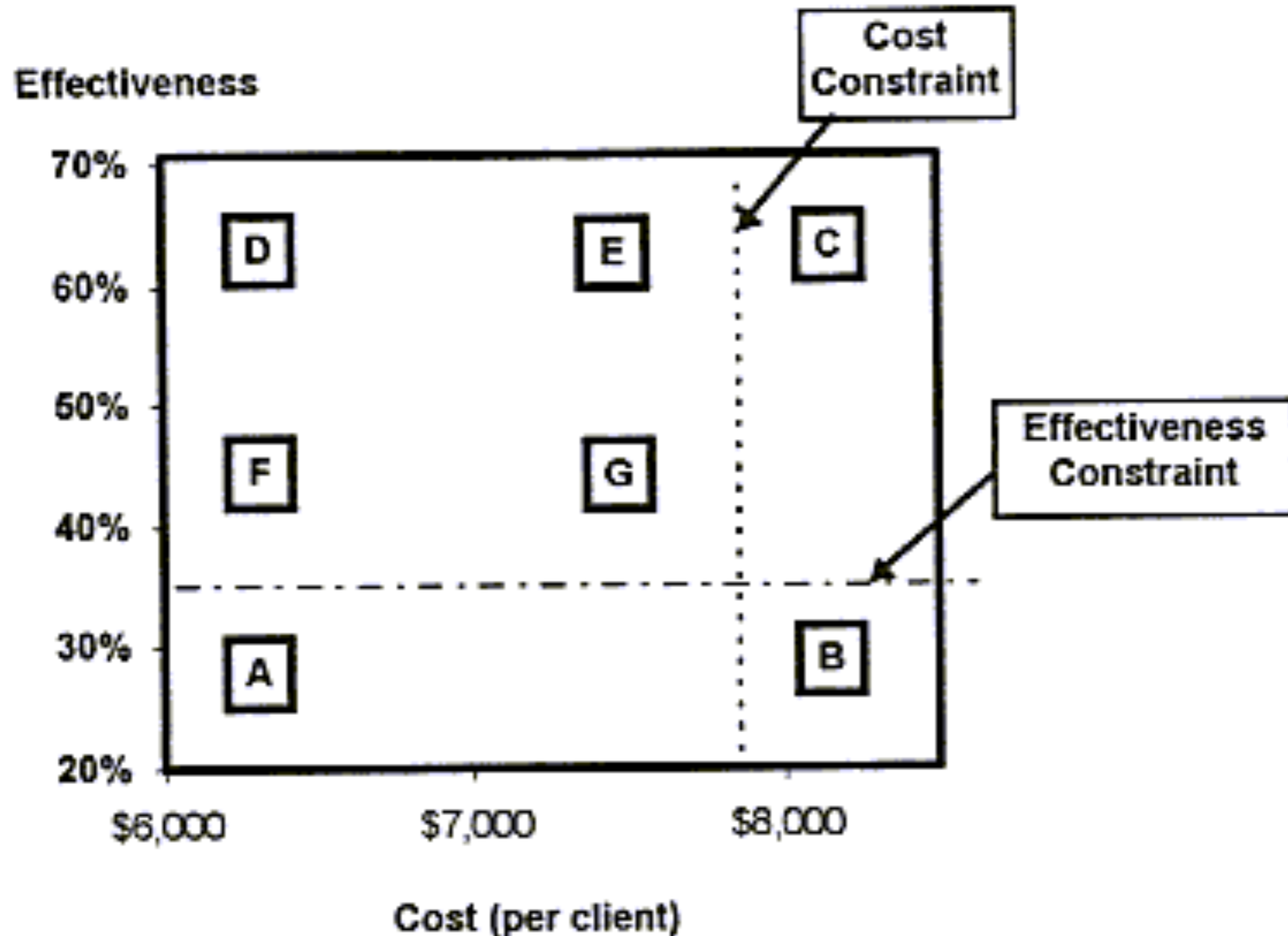
Siegert & Yates (1980):

Outcomes = $f(\text{Procedures})$

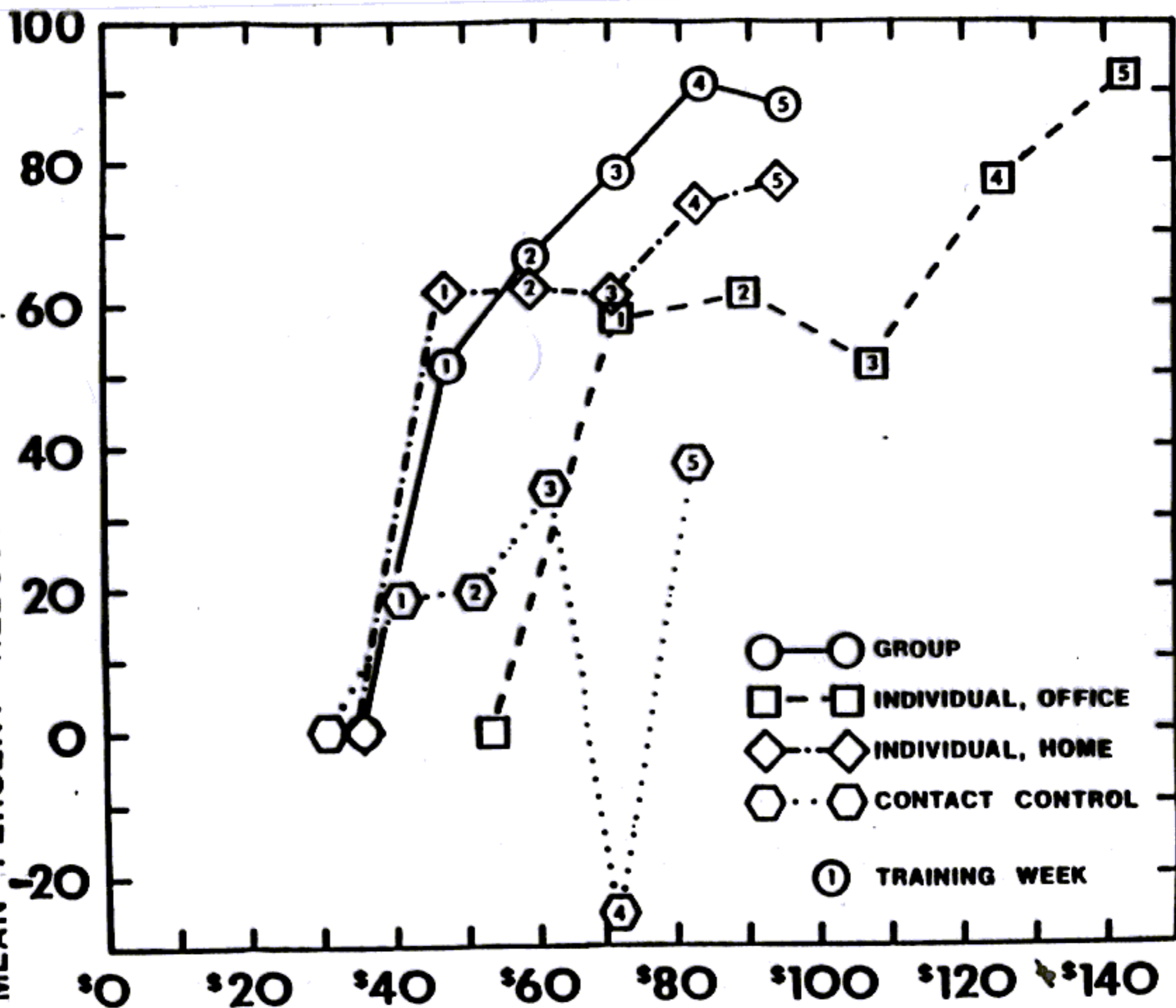


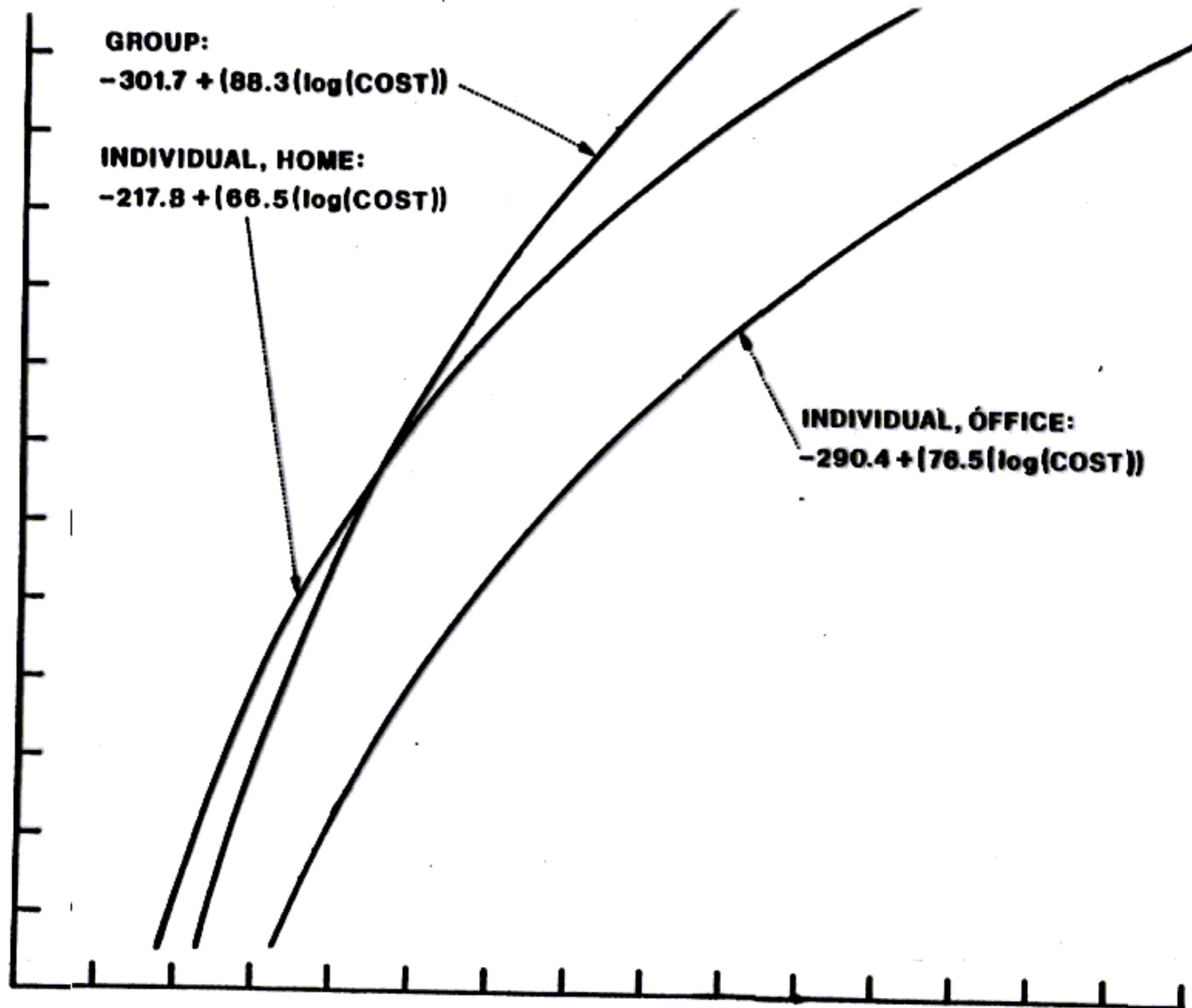
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Decision-Making in Cost → Outcome Graphs



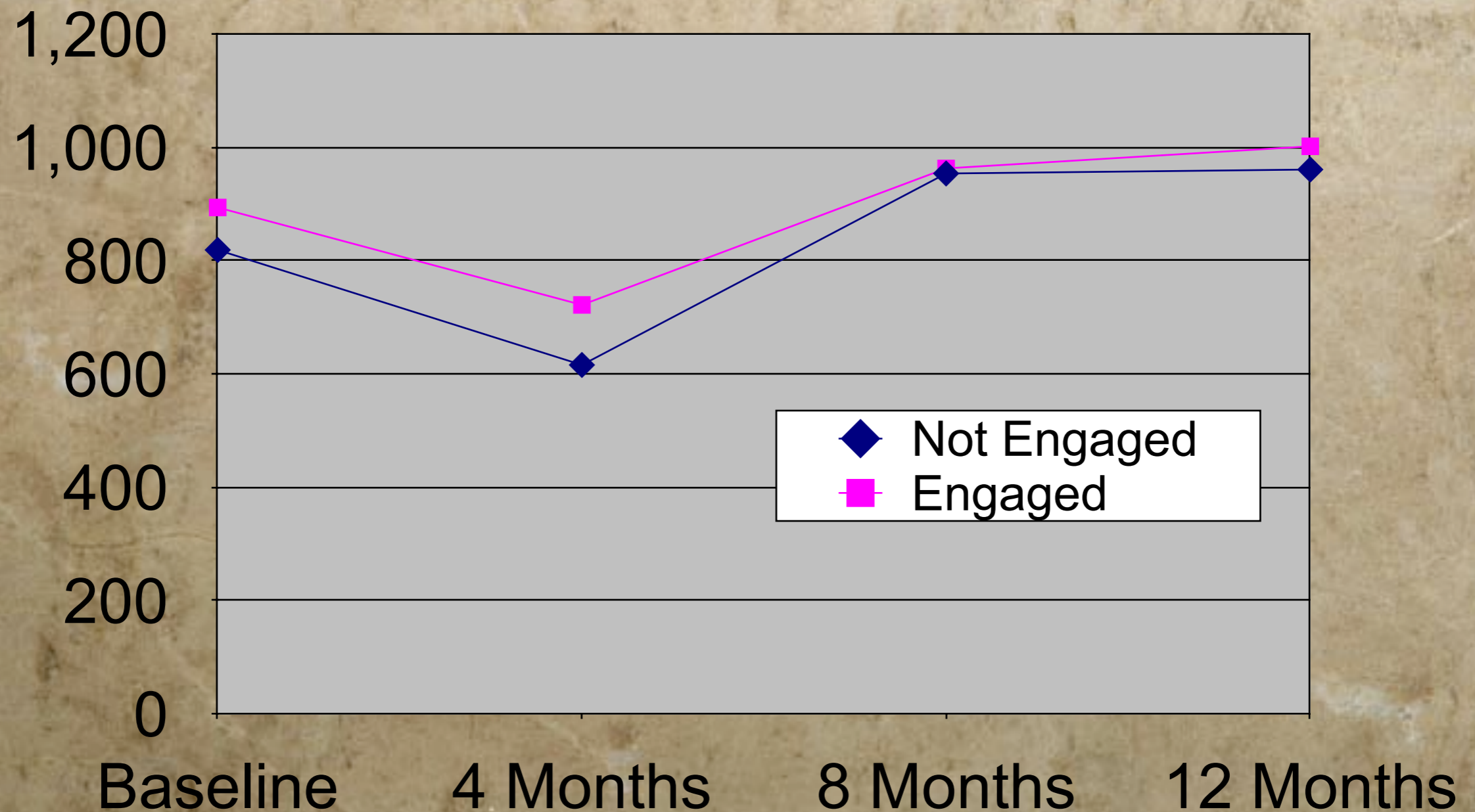
MEAN PERCENT REDUCTION IN TARGET BEHAVIORS





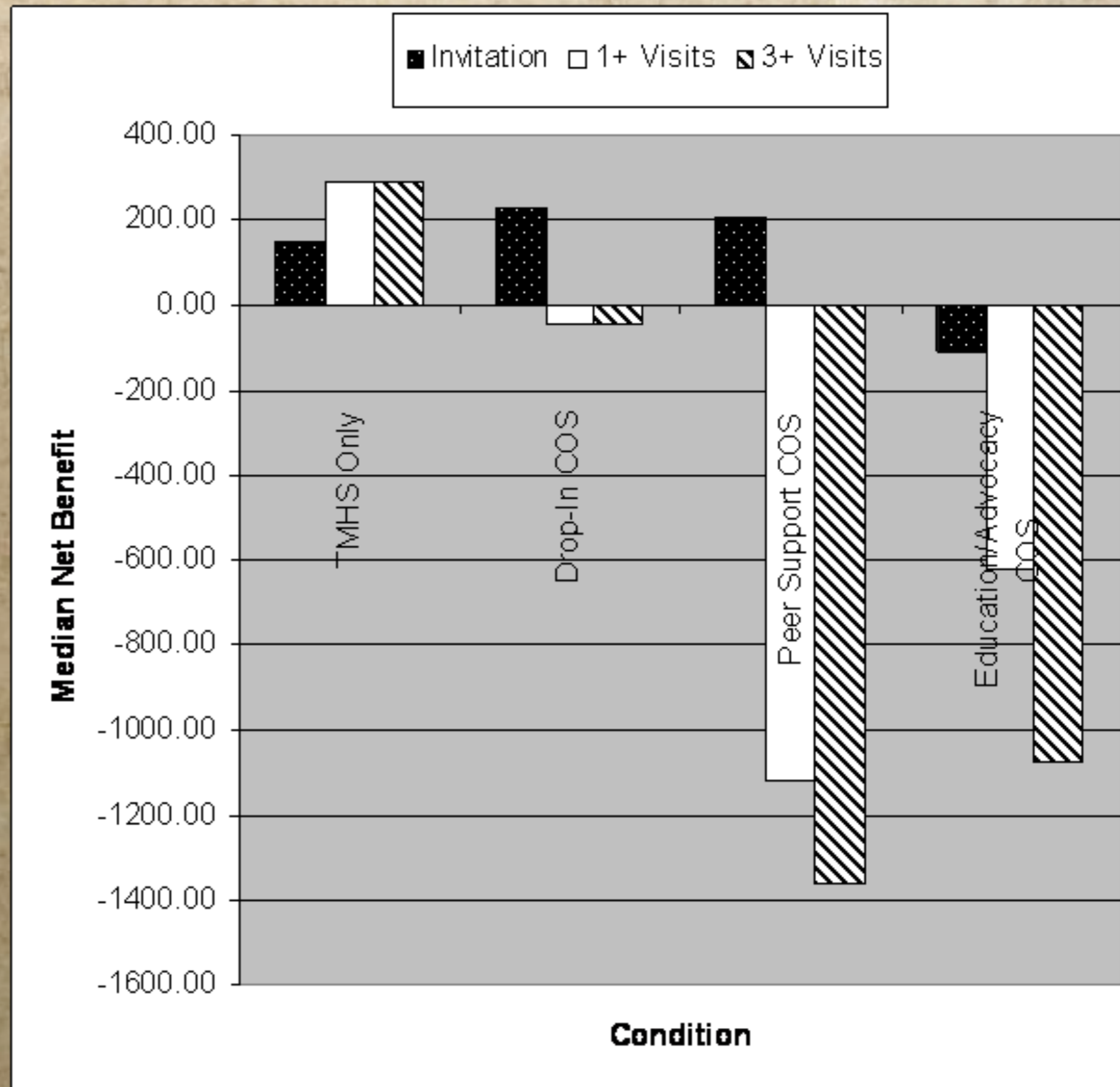
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Physical Health Services Used by Consumers Not Engaged and Engaged in COSPs



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CBA for
type of
COS x
degree of
engage-
ment



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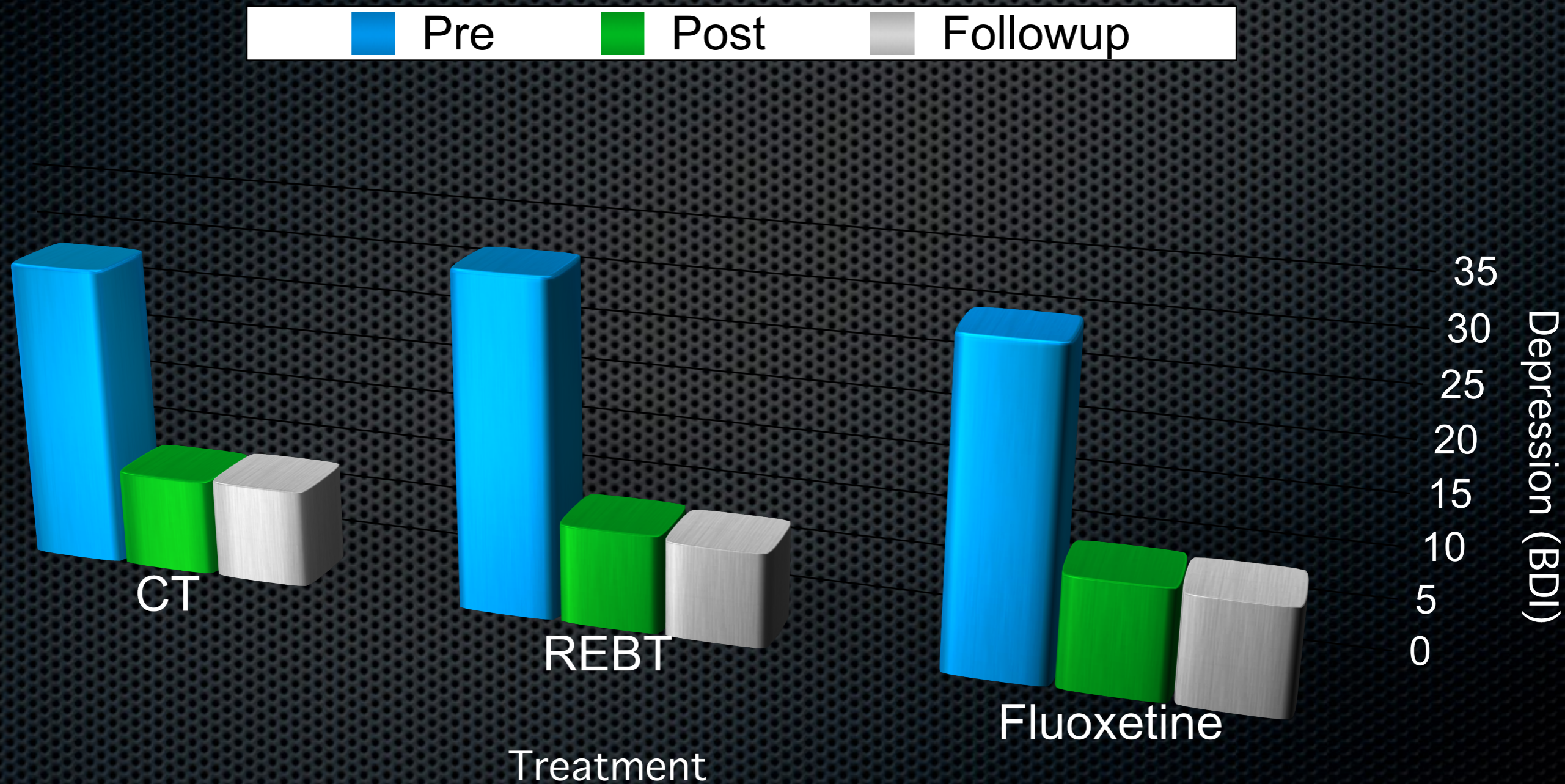
CEA & CUA

of Cognitive-Behavioral and Pharmacologic Treatments for Depression

Sava, F. A., Yates, B. T., Lupu, V., Hatieganu, I., Szentagotai, A., & David, D. (2009). Cost-effectiveness and cost-utility of cognitive therapy, rational emotive behavioral therapy, and fluoxetine (Prozac ®) in treating depression: A randomized clinical trial. *Journal of Clinical Psychology*, 65, 36-52.

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Depression (Beck Depression Inventory)



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Psychotherapy and Pharmacotherapy Cost Calculation

Calculation of Psychotherapy and Pharmacology Costs Using a Resources \times Procedures Matrix (\$U.S.)

Resource type	Unit measure	Unit cost	Total resource used per client			Total cost per client		
			REBT	CT	Fluoxetine (Prozac)	REBT	CT	Fluoxetine (Prozac)
Provider time								
CBT therapists	1 hr	\$6.59	20.98 hr	20.41 hr	0 hr	\$138.25	\$134.49	\$0
Medication	1 hr	\$8.09	0 hr	0 hr	6.95 hr	\$0	\$0	\$56.25
psychiatrists								
Assessor	1 hr	\$4.56	0.33 hr	0.33 hr	0.33 hr	\$1.51	\$1.51	\$1.51
Research assistant	1 hr	\$3.55	0.30 hr	0.30 hr	0.29 hr	\$1.06	\$1.06	\$1.03

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Psychotherapy and Pharmacotherapy Cost Calculation (continued)

Resource type	Unit measure	Unit cost	Total resource used per client			Total cost per client		
			REBT	CT	Fluoxetine (Prozac)	REBT	CT	Fluoxetine (Prozac)
Space + Utilities	1 m ² /1 hr	\$0.16	274.74 m ² /hr	267.64 m ² /hr	102.95 m ² hr	\$43.52	\$ 42.39	\$16.31
Materials	1 testing set	\$1.03	1.91 sets	1.89 sets	1.86 sets	\$1.97	\$1.95	\$1.92
Investment	Manual/client	\$0.36	1.00 manual	1.00 manual	1.00 manual	\$0.36	\$0.36	\$0.36
Medication	1 dose = 20 mg	\$1.27	0 mg	0 mg	159.65 doses	\$0	\$0	\$202.31
Maintenance meds	1 dose = 20 mg	\$1.27	0 mg	0 mg	156.46 doses	\$0	\$0	\$198.27
Provider direct cost						\$186.66	\$181.76	\$477. 95
Overhead						\$93.33	90.88	\$38. 69
Healthcare cost						\$279.99	\$272.64	\$516.64

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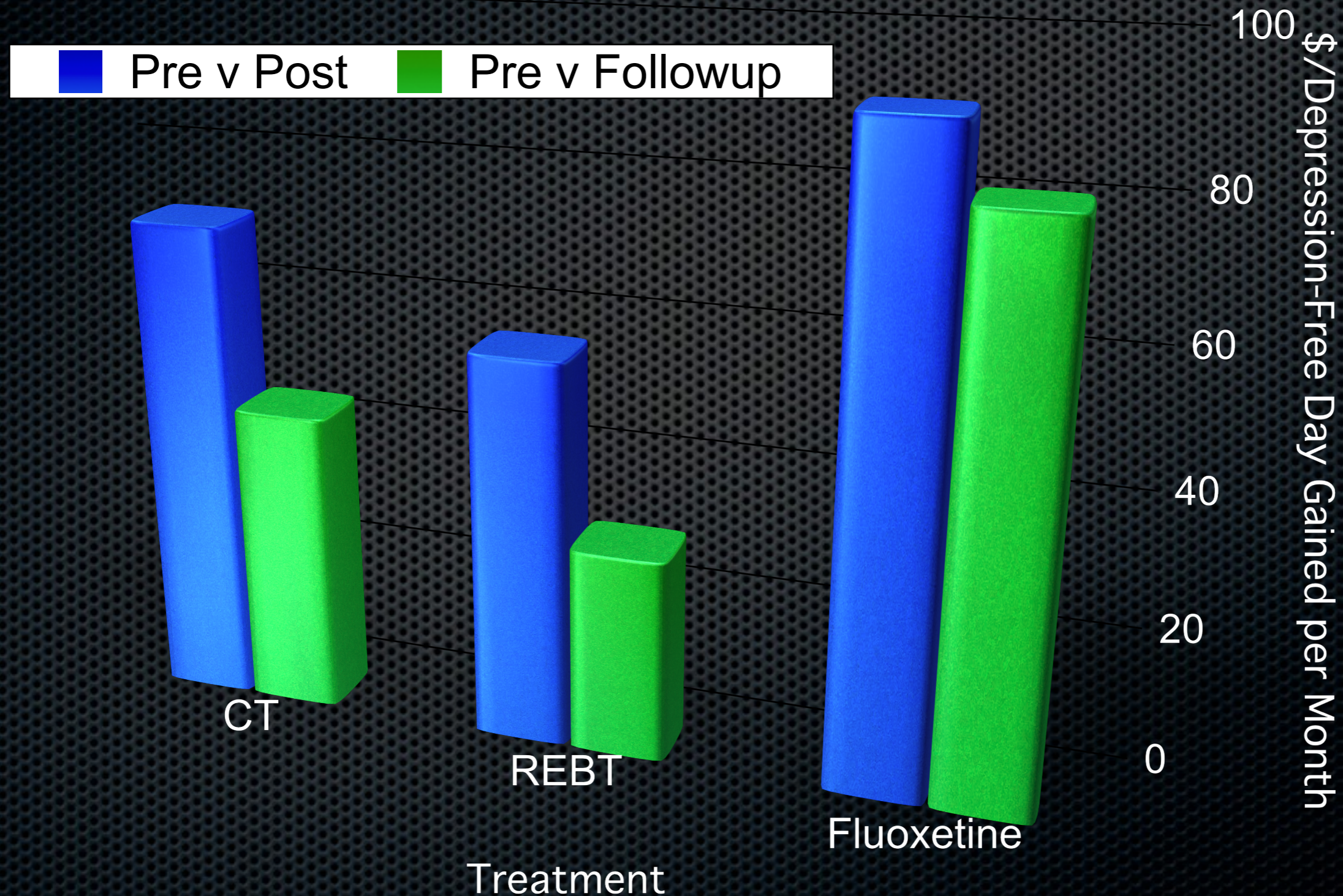
Psychotherapy and Pharmacotherapy Cost Calculation (more)

			Total resource used per client			Total cost per client		
Resource type	Unit measure	Unit cost	REBT	CT	Fluoxetine (Prozac)	REBT	CT	Fluoxetine (Prozac)
Client								
Client time	1 hr	\$6.13	32.10 hr	31.25 hr	18.00 hr	\$196.78	\$191.50	\$110.35
Transportation cost	1 round trip (rt)	\$1.90	21.98 rt	21.41 rt	21.02 rt	\$41.78	\$40.70	\$39.95
Client cost						\$238.56	\$232.20	\$150.30
Total cost per treatment = no. patients \times (Healthcare cost + Client cost)						\$29,557	\$28,271	\$38,016
Total cost per average patient = (Healthcare cost + Client cost)						\$518.55	\$504.84	\$666.94
Total cost per successful patient = Total cost per treatment/ n success*						\$703.75	\$724.90	\$1,056.00

**Note.* “Success” refers to the number of recovered or improved patients [42 of 57 for REBT, 39 of 56 for CT, and 36 of 57 for fluoxetine (Prozac)].

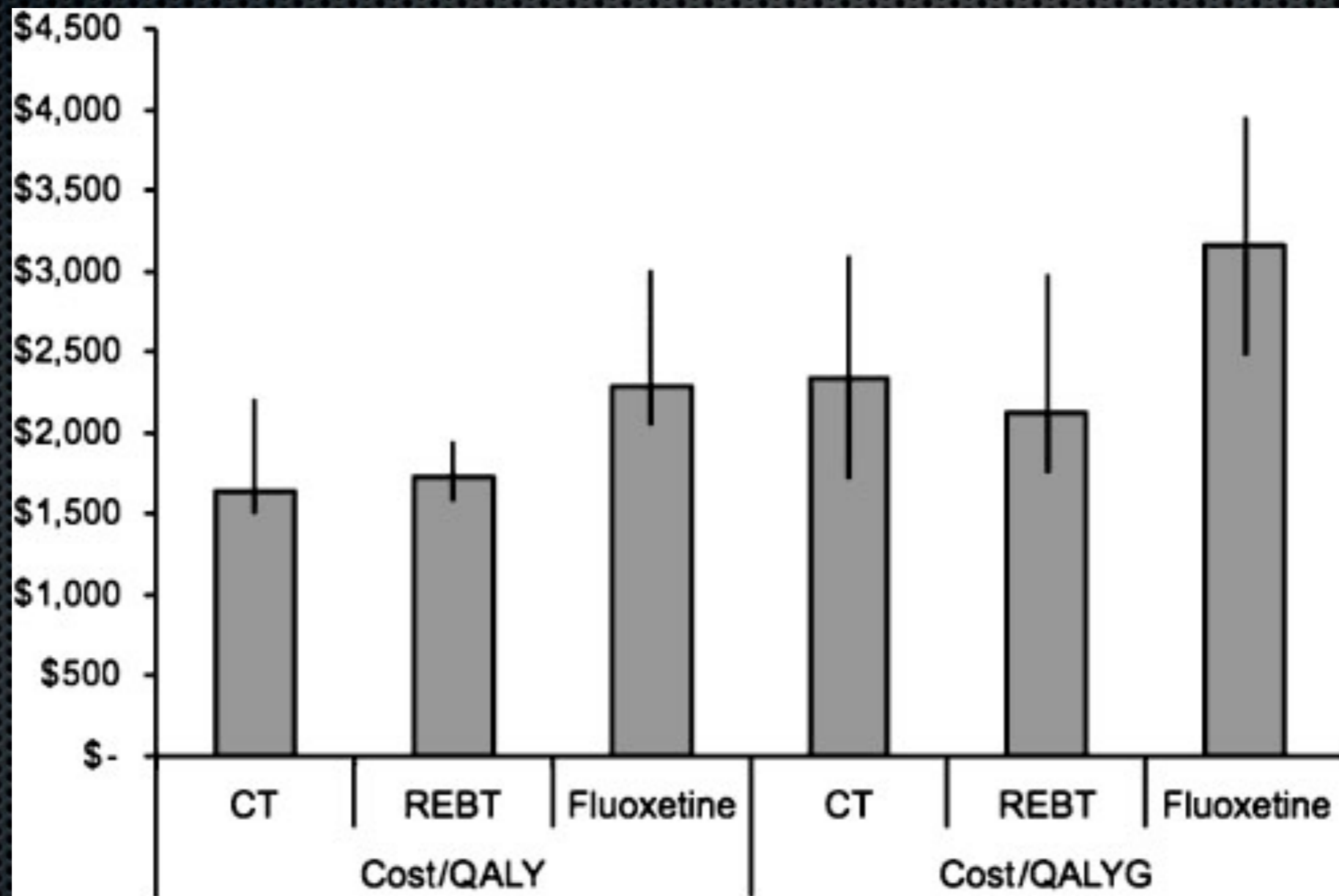
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Cost per Depression-Free Day Gained per Month



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Costs per QALY & QALY Gained



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questions, answers