# Using theory to guide quantitative formative research: A test of three social influence models

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*The findings and conclusions herein are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention.*

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National Center on Birth Defects
and Developmental Disabilities

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# Background: Neural Tube Defects (NTDs)

***Graphic photo warning!

- Serious birth defects…
  - Brain (anencephaly)
  - Spine (spina bifida)
  - Happen in first 21 days
  - Affect over 3,000 pregnancies each year in the US

- Up to 70% are preventable with folic acid
  - Water soluble B vitamin
  - Need 400 $\mu$g each day (USPHS, IOM, CDC)

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# Background: What we know…

- 50% of pregnancies in US are unplanned
- 33% of childbearing-age (CBA) women take a vitamin containing folic acid – relatively unchanged for a decade
- 84% are aware of folic acid
- 25% know folic acid prevents birth defects
- 7% know folic acid should be taken prior to pregnancy
- Despite fortification, need to increase multivitamin (MV) use
- Increasing sustained multivitamin use among CBA women has been elusive

Lawrence et al. (2003); Lindsey et al. (2005); PRDH (2005)

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# Project Goals

- Prevention of NTDs
- Encourage women to consume multivitamins that contain folic acid daily before becoming pregnant
- Determine which theory or set of theoretical constructs can best guide development of messages designed to increase multivitamin use among women of child-bearing age


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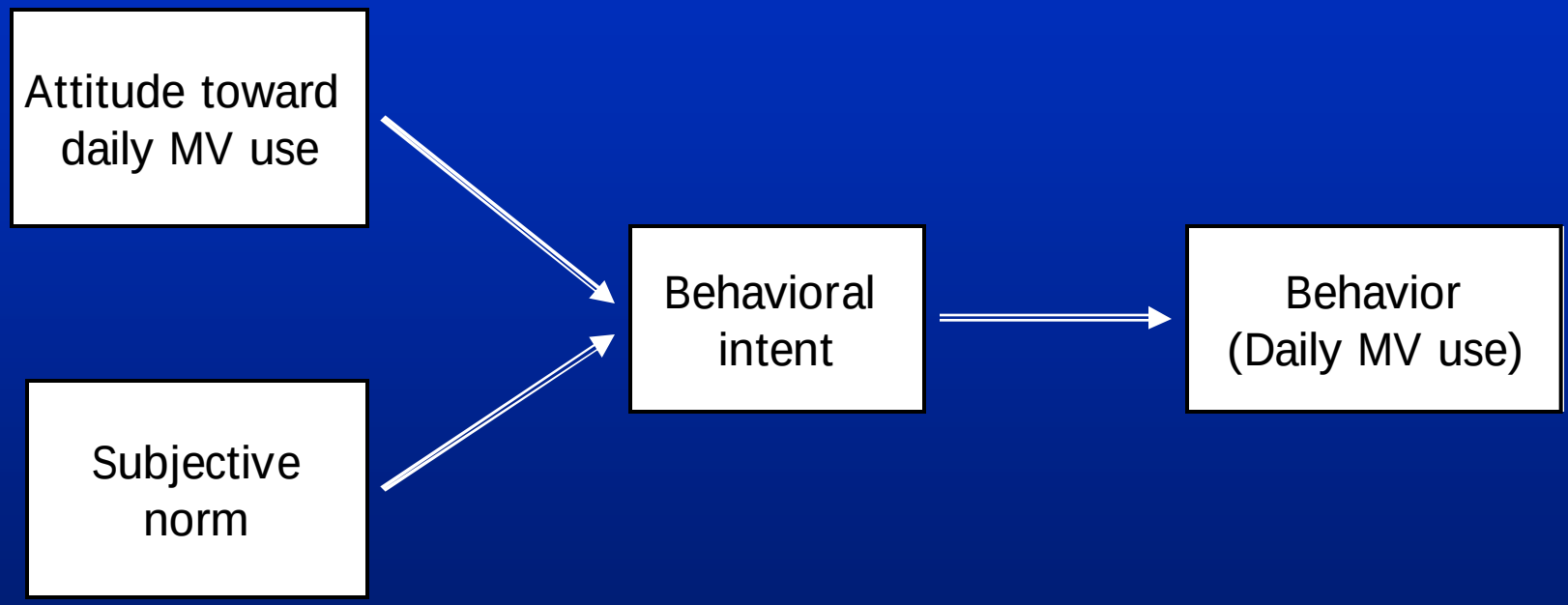
# Selecting the Theories...

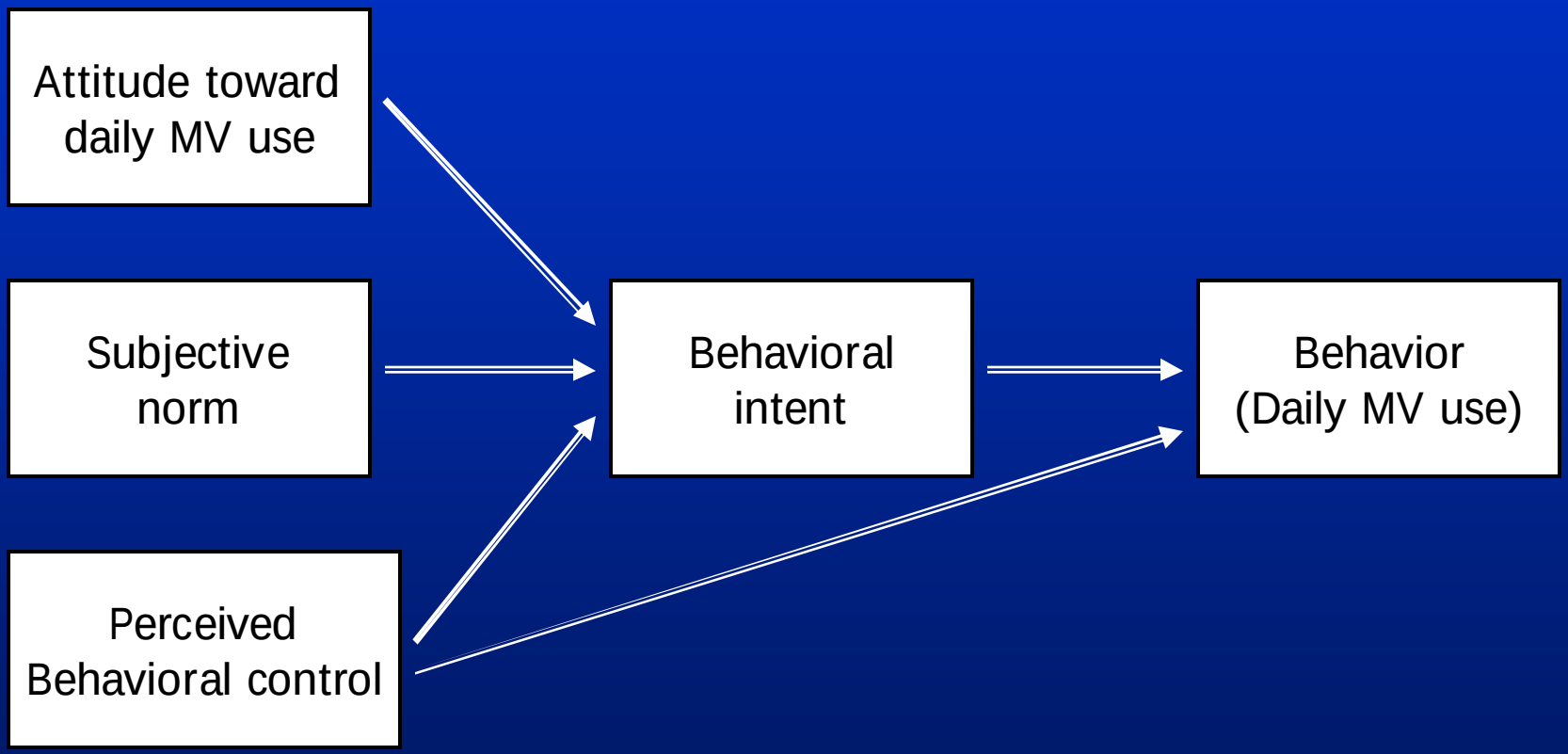
- Many health communication theories offer insight into changing behavior at many different levels.
- We chose three commonly used theories:
  - Theory of Reasoned Action
  - Theory of Planned Behavior
  - Social Cognitive Theory

# Theory of Reasoned Action (TRA)




Ajzen & Fishbein, 1970, 1974, 1980a, 1980b; Fishbein & Ajzen, 1975

# Theory of Planned Behavior (TPB)




Ajzen, 1985, 1987, 1988, 1991

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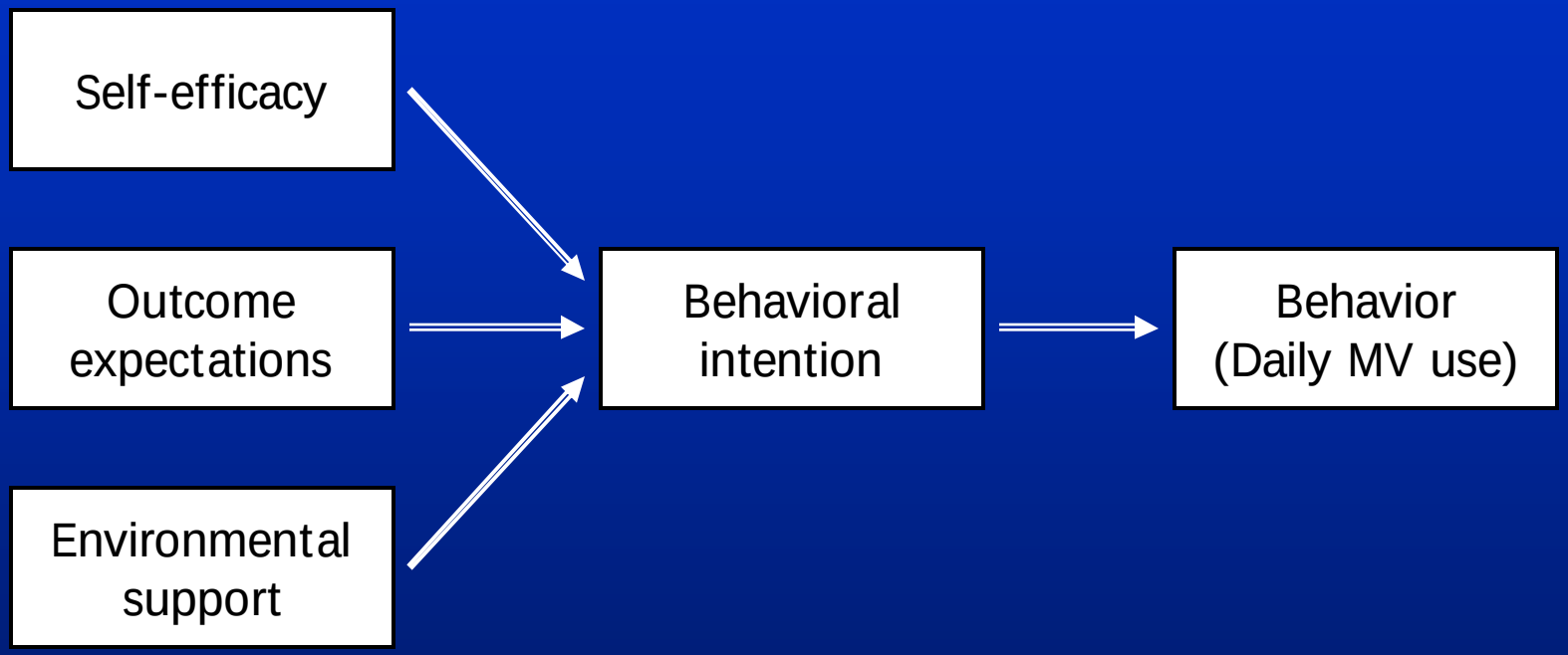
# Social Cognitive Theory (SCT)




Bandura, 1977, 1986, 2004

# Hypotheses and RQ

- H1: TRA will explain MV consumption behavior in women of childbearing age
- H2: TPB will explain MV consumption behavior in women of childbearing age
- H3: SCT will explain MV consumption behavior in women of childbearing age
- RQ1: Which combination of constructs from these theories best explains MV consumption in women of childbearing age?

# Methodology

- HealthStyles 2004 data examined
- Nationwide mail panel survey
- 4,214 surveys returned (71% response)
- Selected only data from women ages 18-45 (*N* = 1,048)
- Items measuring all relevant theoretical constructs were developed by Prevention Research team (many modified from literature)

# Sample Demographics

Of the 1,048 women ages 18-45:

- Age: *M* = 33.50, *SD* = 7.45
  Median = 34; Mode = 24
- Marital status: 56% married
  31% never married
  12% widowed/divorced/other
- Education: 4% less than High School
  25% High School graduate
  41% some college
  21% college graduate
  9% graduate school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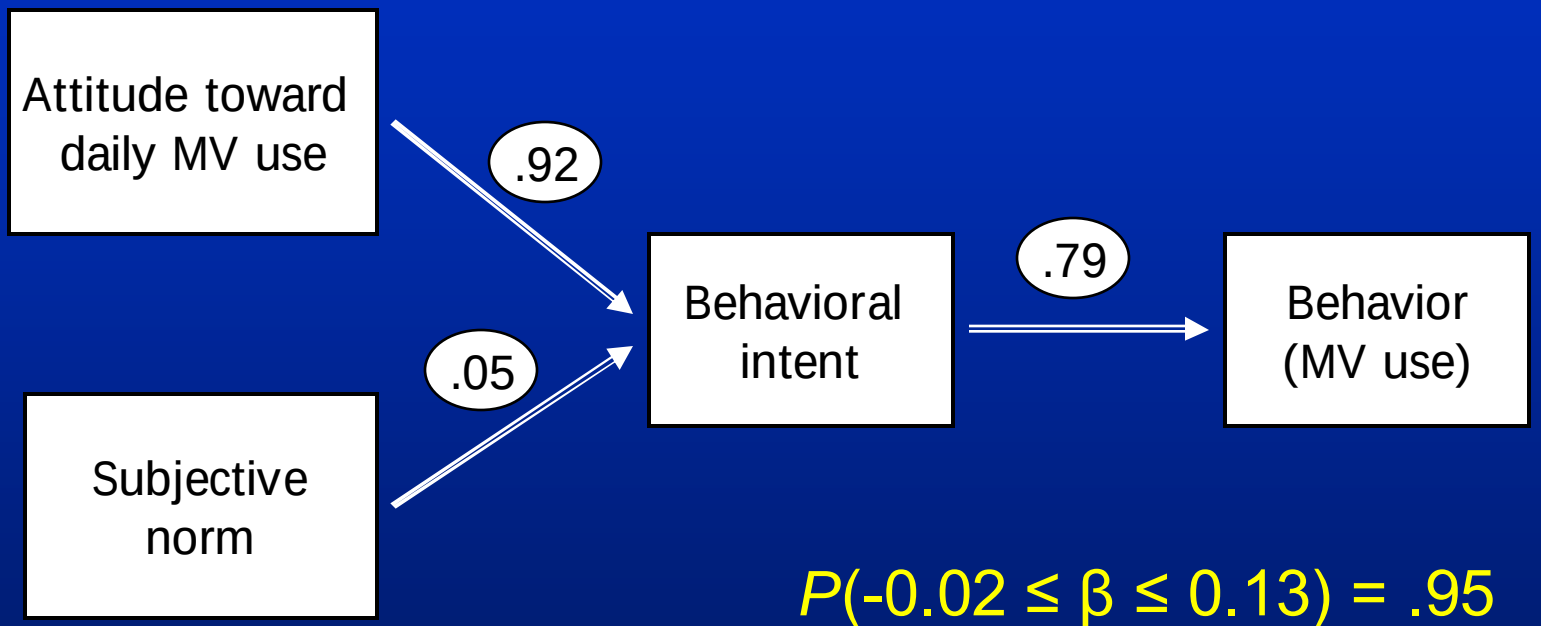
# Sample Demographics

- Employment: 63% employed full time
  11% part time
  17% homemaker
- Income: Range = <$5,000 - $300,000+
  Mean = $34,000
  Median = $40,000 – 44,999
- Race: 64% White
  14% African-American
  16% Hispanic
  2% Asian
  4% other

# Data Analytic Method

- Confirmatory factor analysis validated measurement model
- Ordinary Least Squares path analysis program – Pathe (Hunter)
  - Path coefficients should be substantial and not within sampling error of zero
  - Errors should be relatively small

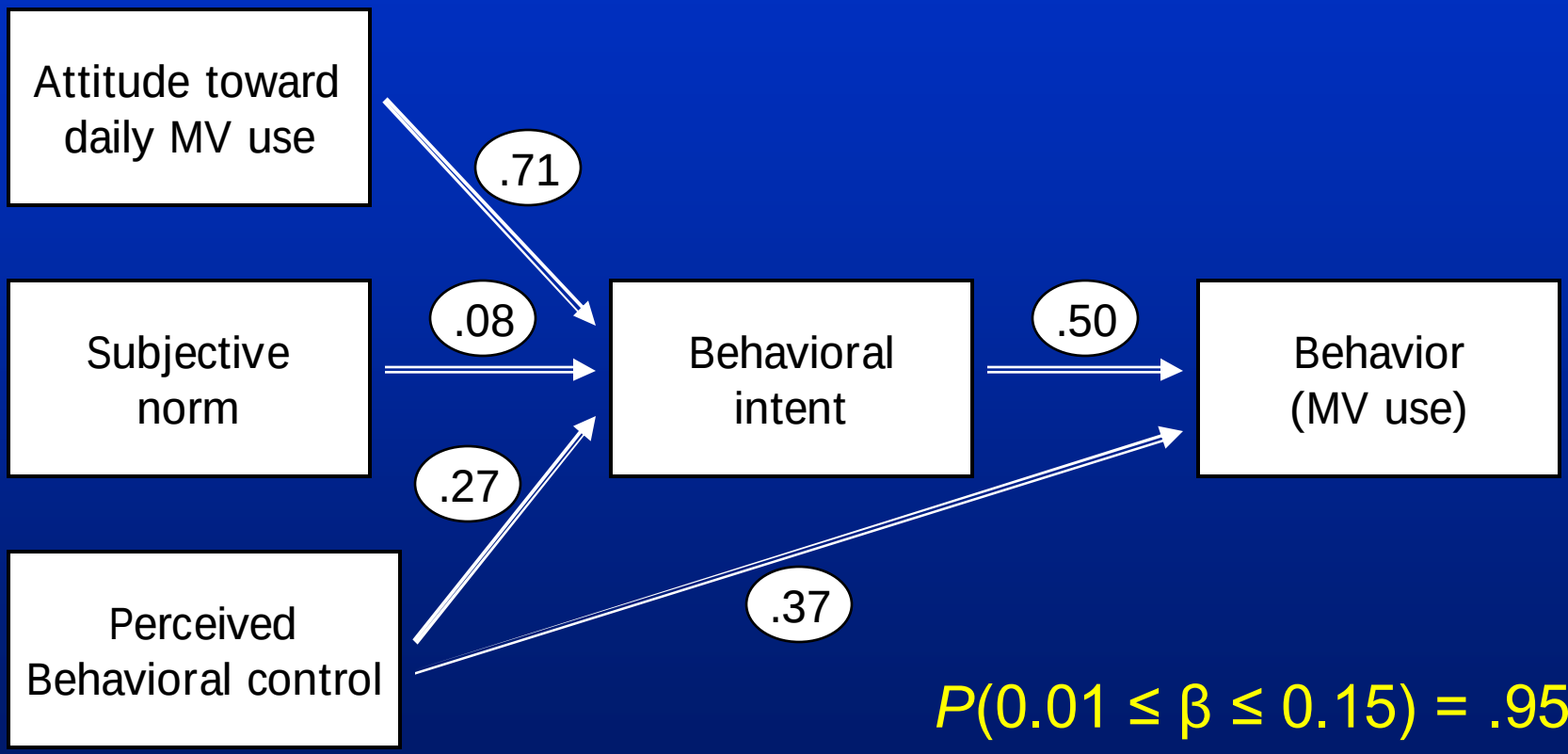
# Results: Theory of Reasoned Action




$P(-0.02 \leq \beta \leq 0.13) = .95$

Errors ranged from -.02 to -.07

# Results: Theory of Planned Behavior




$P(0.01 \leq \beta \leq 0.15) = .95$

Errors ranged from -.02 to -.03

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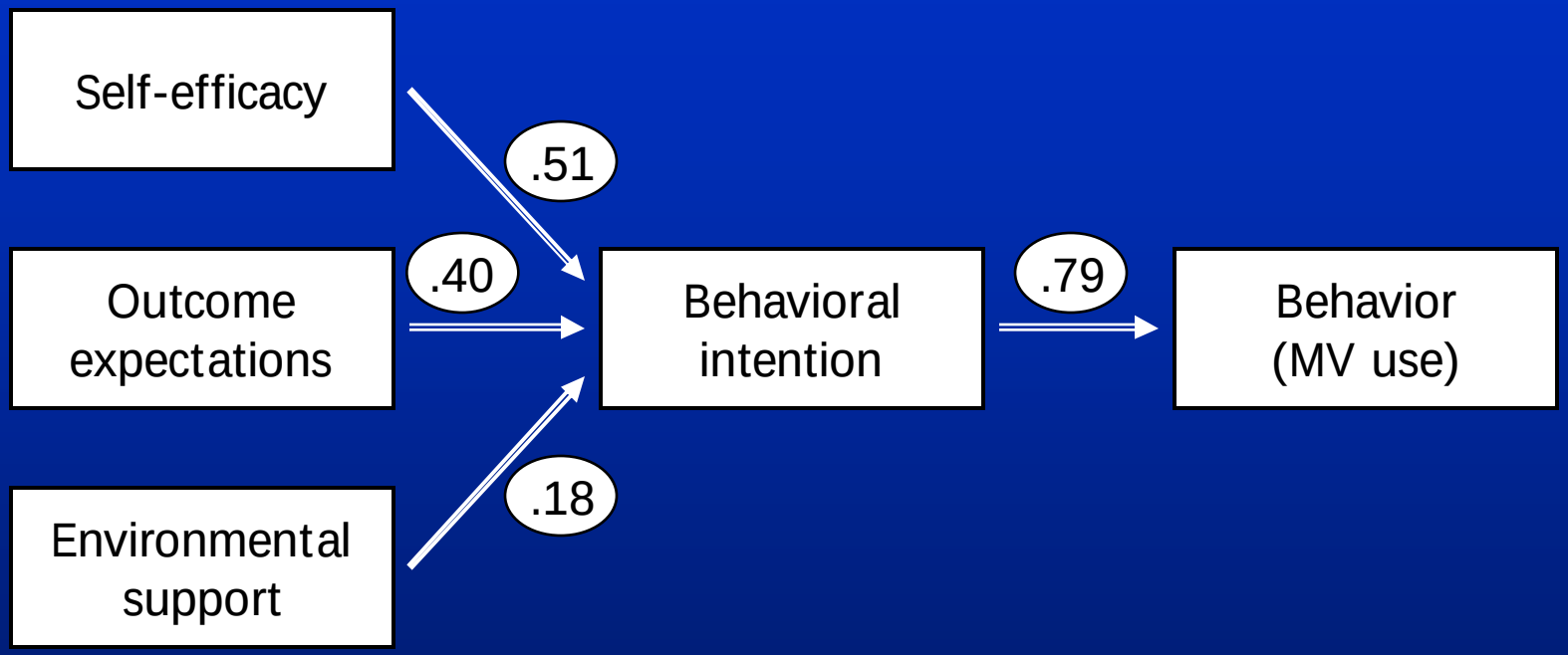
# Results: Social Cognitive Theory




Errors ranged from -.02 to .14

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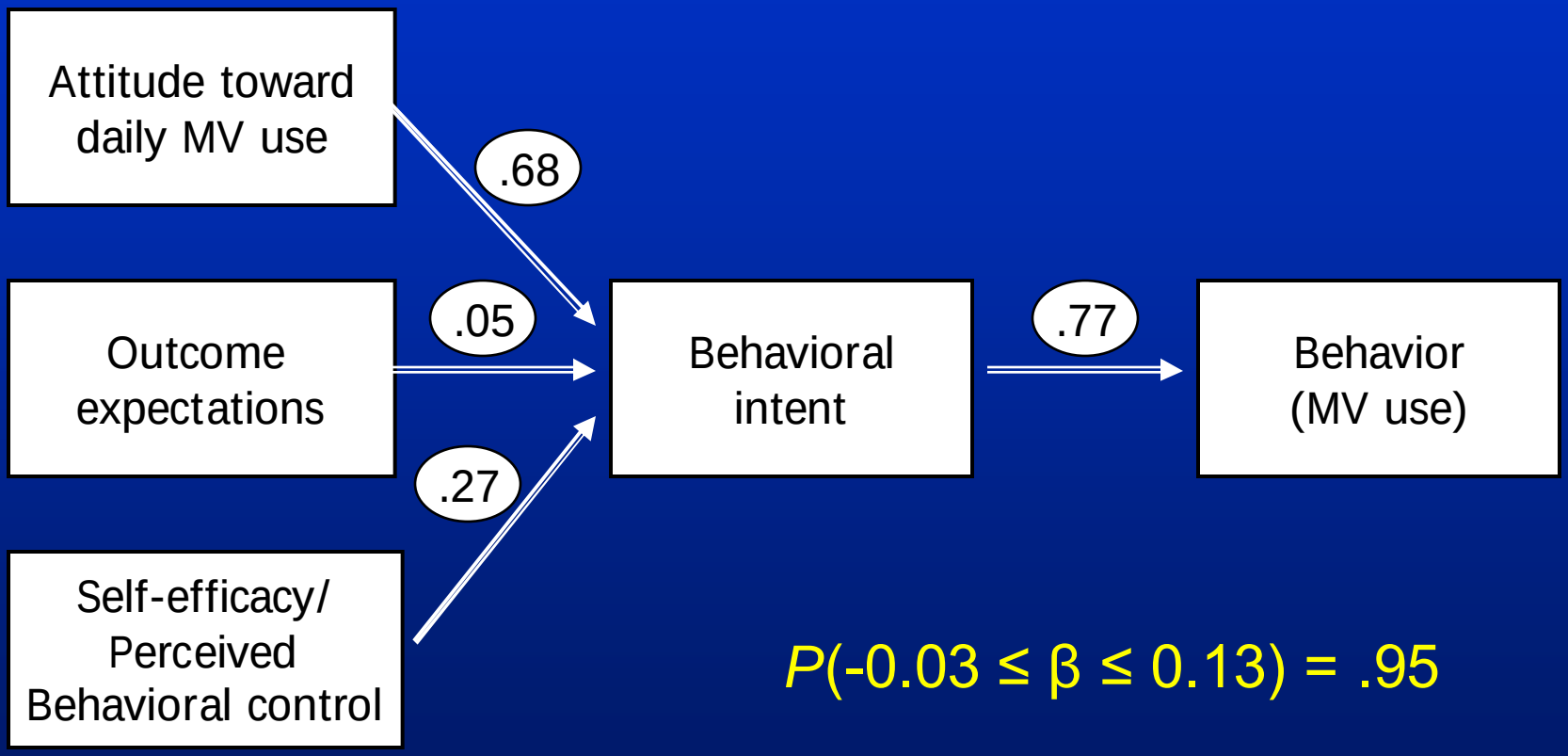
# Summary of Hypotheses Results

- H1: data not consistent (TRA does not explain multivitamin consumption)
- H2 and H3 both merit consideration
  - TPB: low errors, one weak path coefficient
  - SCT: ample path coefficients, one larger error
- RQ: Strongest predictors from the three models created post hoc model

# Post Hoc Model Testing Strongest Predictors




$P(-0.03 \leq \beta \leq 0.13) = .95$

Errors ranged from -.02 to .14

# Theoretical and Practical Implications

- The strongest predictors of multivitamin use were ATTITUDE and SELF-EFFICACY.
- Other OUTCOME EXPECTATIONS warrant investigation.
- Many women are not receptive to pregnancy messages; messages must create positive attitudes and increase self-efficacy.

# Final Thoughts

- Given current low folic acid consumption levels, we need to find creative ways to encourage women of childbearing age to take folic acid every day.
- Health communication theories help by providing an explanation for behavior.
- Using these theories to create effective persuasive messages, we can work toward significantly reducing birth defects.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# Final Thoughts

- On our way to meeting our goal:

  To develop campaigns designed to increase the number of childbearing-aged women who consume 400 μg of folic acid daily through a varied diet including folate-rich and fortified foods, and who take a vitamin containing folic acid daily to prevent neural tube defects.

Healthy Babies!

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Please direct questions about this project or requests for electronic copies of the paper to Lindsey@msu.edu or KopfmanJ@cofc.edu

More information about folic acid and birth defects is available at www.cdc.gov/ncbddd

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