



# Predicting and Explaining Behavioral Intention and Hand Sanitizer Use Among U.S. Army Soldiers

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# Introduction

- Military Waterless Environment<sup>1</sup>
- Acute illness among soldiers<sup>2</sup>
  - Respiratory infections<sup>3</sup>
  - Gastrointestinal infections<sup>4</sup>

<sup>1</sup> Czerwinski, et al., 2001; Fein, Lin, & Levy, 1995

<sup>2</sup> Girou, Loyeau, Legrand, Oppein, & Brun-Buisson, 2002

<sup>3</sup> Ryan, Christian, & Wohlrabe, 2001; Sanders, Putnam, Frankart, Frenck, & Monteville, 2005; Soltis, Sanders, Putnam, Tribble, & Riddle, 2009

<sup>4</sup> Butz, Larson, Fosarelli, & Yolken, 1990; CDC, 2011; Hall, Wikswo, Pringle, Gould, & Parashar, 2014; Sanders, Putnam, Frankart, Frenck, & Monteville, 2005



# Hand Hygiene

- Hand hygiene is important during preparation, distribution, and consumption of food.<sup>1</sup>
- Hand hygiene includes both hand washing or the use of hand sanitizers.<sup>2</sup>
- Consumer behavior is an important point of intervention to reduce foodborne illnesses.<sup>3</sup>

<sup>1</sup> Armed Forces Health Surveillance Center, 2014; Arness et al., 2000; Hedberg et al., 2006

<sup>2</sup> Fein, Lin, & Levy, 1995; Greig, Todd, Bartleson, & Michaels, 2007; Hedberg et al., 2006; Hilburn, Hammond, Fendler, & Groziak, 2003

<sup>3</sup> Porta, Greenland, Hernan, Silva, & Last, 2014; Todd, Greig, Bartleson, & Michaels, 2008, 2009

# Problems

- Military need an effective strategy to reduce foodborne illnesses under waterless environments.<sup>1</sup>
- A cost-effective proactive prevention program is necessary.<sup>2</sup>
- Previous training has been effective in improving knowledge, but is less effective for promoting practices.<sup>3</sup>

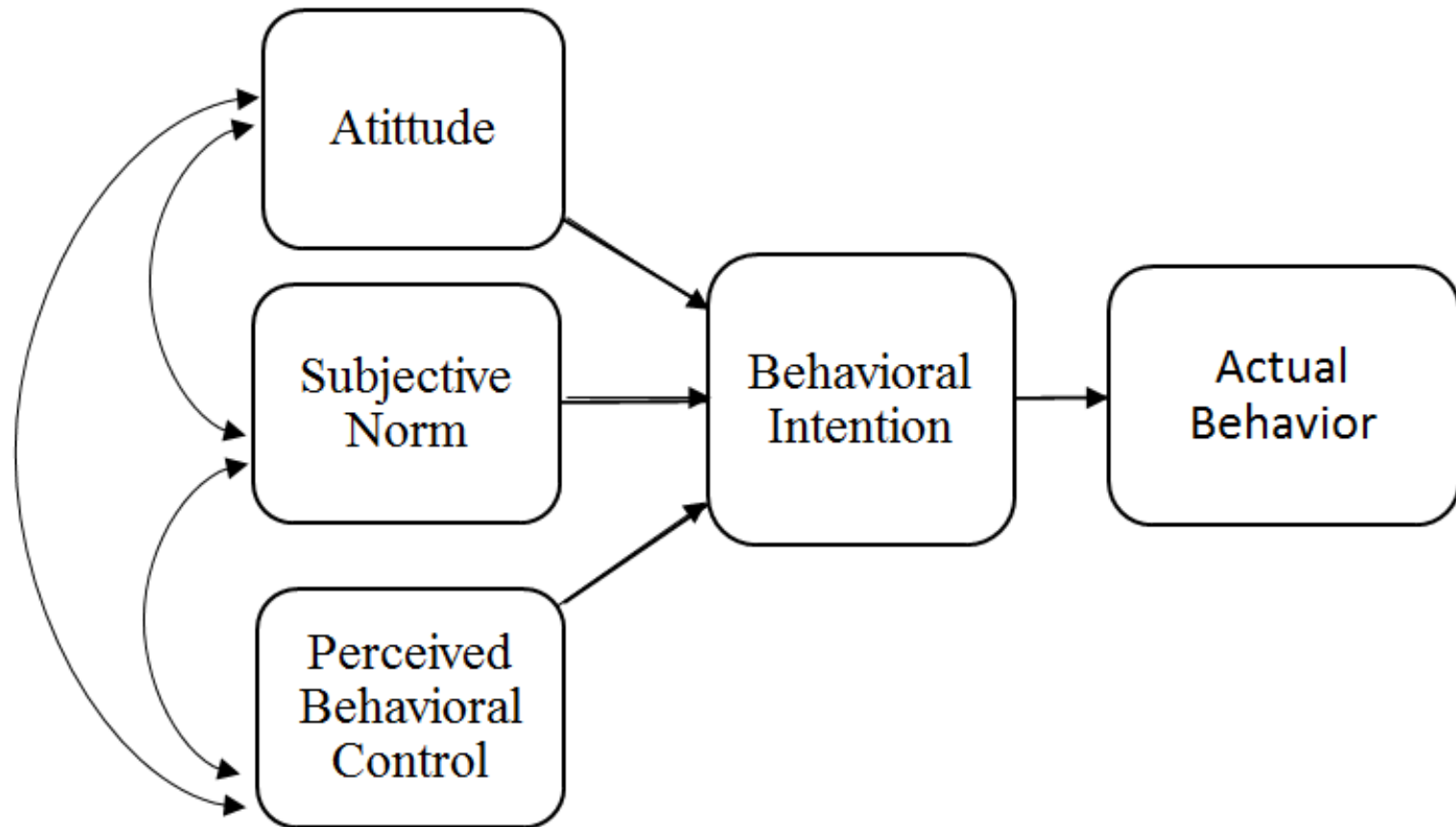
<sup>1</sup> Altman & Fechter, 1967; Czerwinski, et al., 2001; Fein, Lin, & Levy, 1995; Mott et al., 2007; Riddle, Murray, Cash, Pimentel, & Porter, 2013; Russell et al., 2006; <sup>2</sup> Altman & Fechter, 1967; Mott et al., 2007; Riddle, Murray, Cash, Pimentel, & Porter, 2013; Russell et al., 2006; <sup>3</sup> Glanz & Rimer, 1997; Manuel, Tam, & Sameer, 2008; Martin, Knabel, & Mendenhall, 1999

# Justification

- Few studies have been completed within the military.<sup>1</sup>
- No published studies have been conducted within a U.S. Army dining facility.

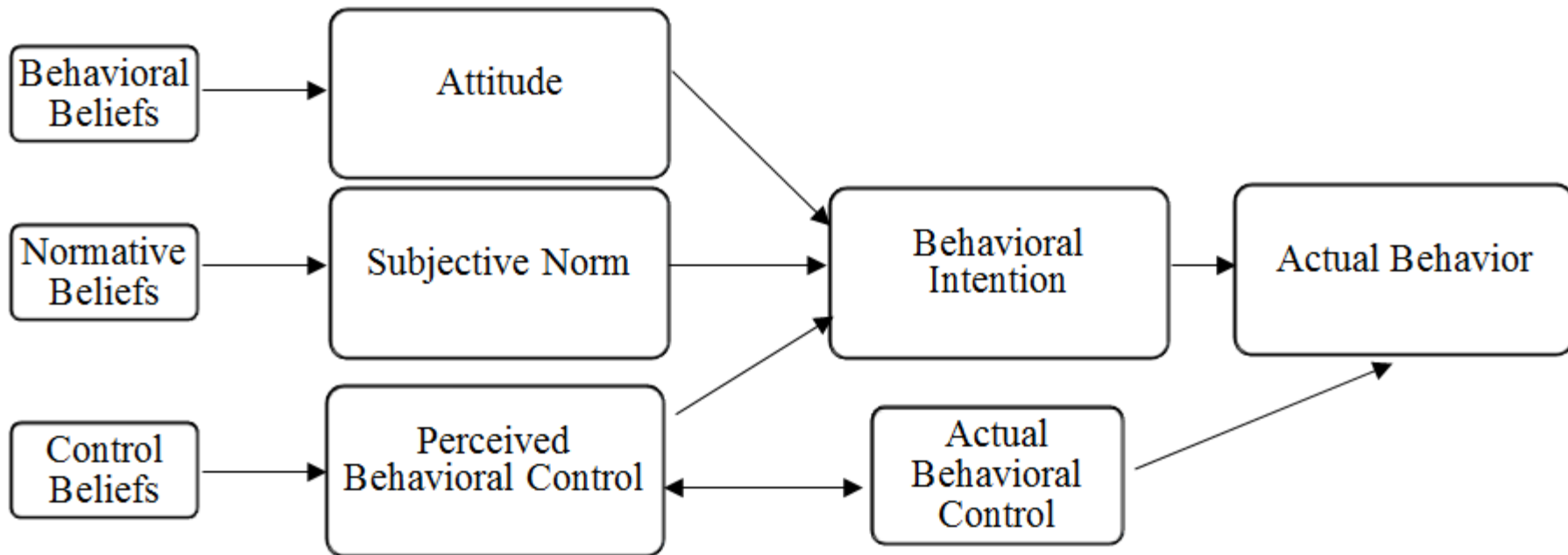
<sup>1</sup> Mott et al., 2007; Gibson, 1997

# The Theory of Planned Behavior



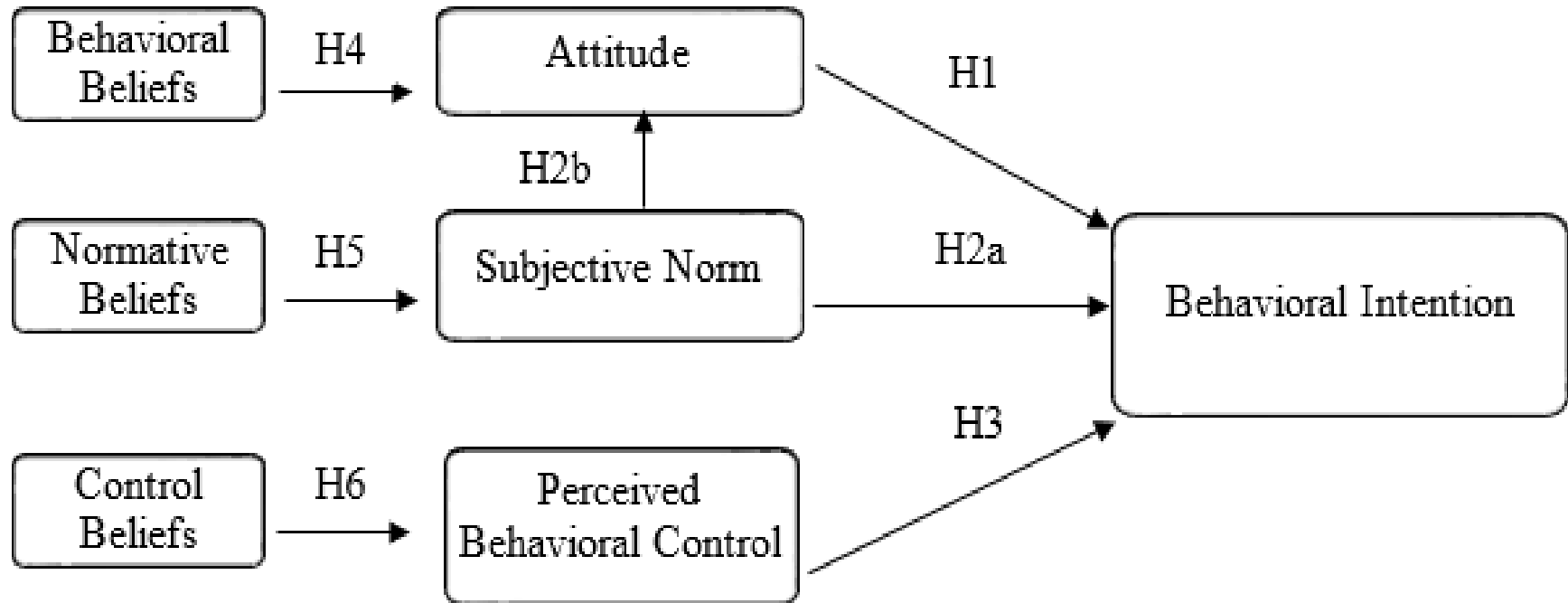
Adapted from Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.

# The Theory of Planned Behavior



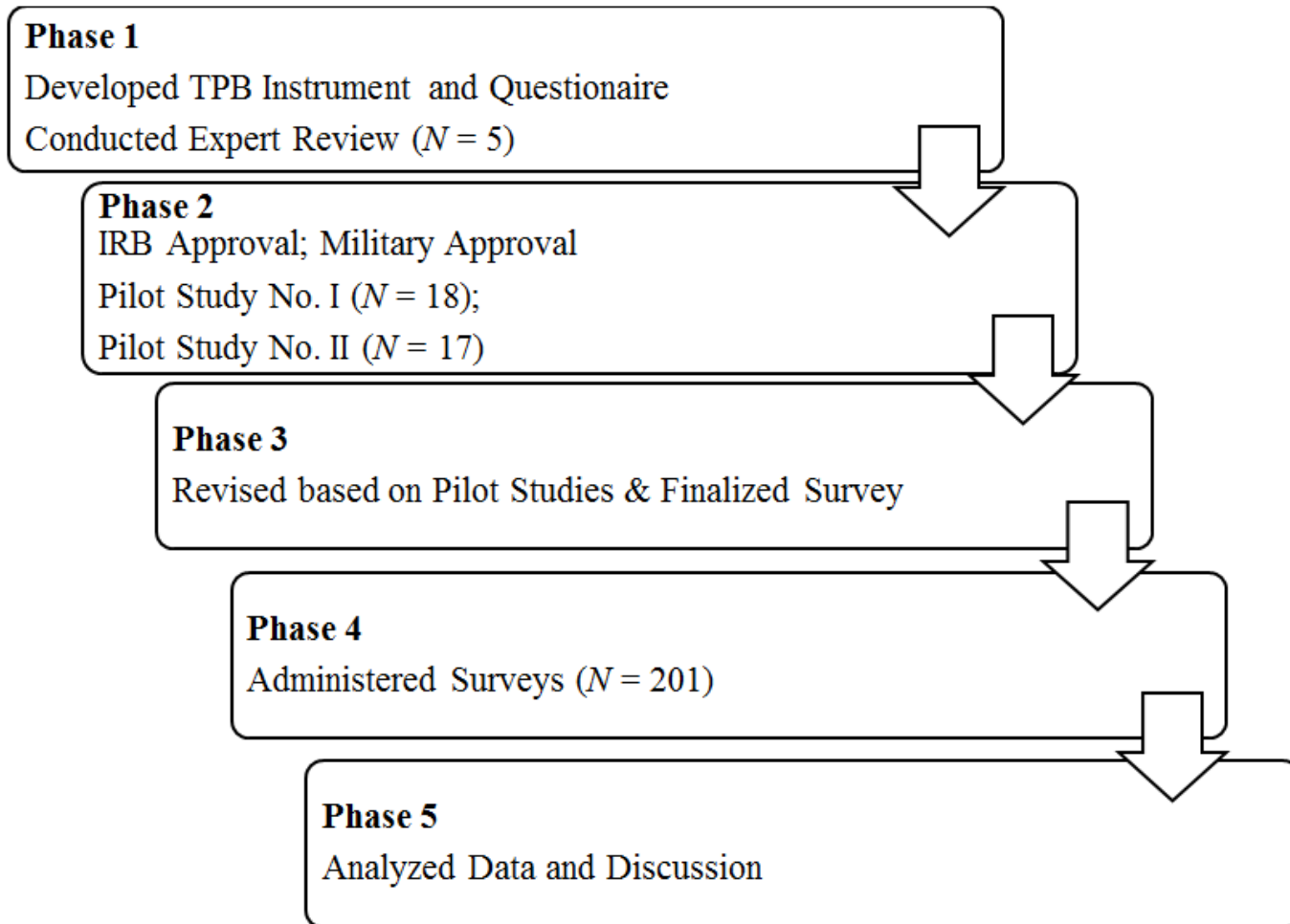
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# Hypotheses





# Methodology





# Demographics

- The majority of respondents were male 186 (92.5%).
- Most soldiers were 18 - 34 years of age (92.5%).
- Most had completed high school (95.1%), were single (83.6%) and earn less than \$29,999/year (71.6%).

# Direct Measurement Constructs

Mean $\pm$ Standard Deviation	Composite Score
Attitudes ( $\alpha = 0.90$ )	5.5 $\pm$ 1.3
Subjective Norms ( $\alpha = 0.82$ )	4.0 $\pm$ 1.5
Perceived Behavioral Control ( $\alpha = 0.70$ )	5.9 $\pm$ 1.1
Behavioral Intention ( $\alpha = 0.93$ )	4.9 $\pm$ 1.6
Self-Reported Behavior ( $\alpha = 0.77$ )	4.3 $\pm$ 1.6

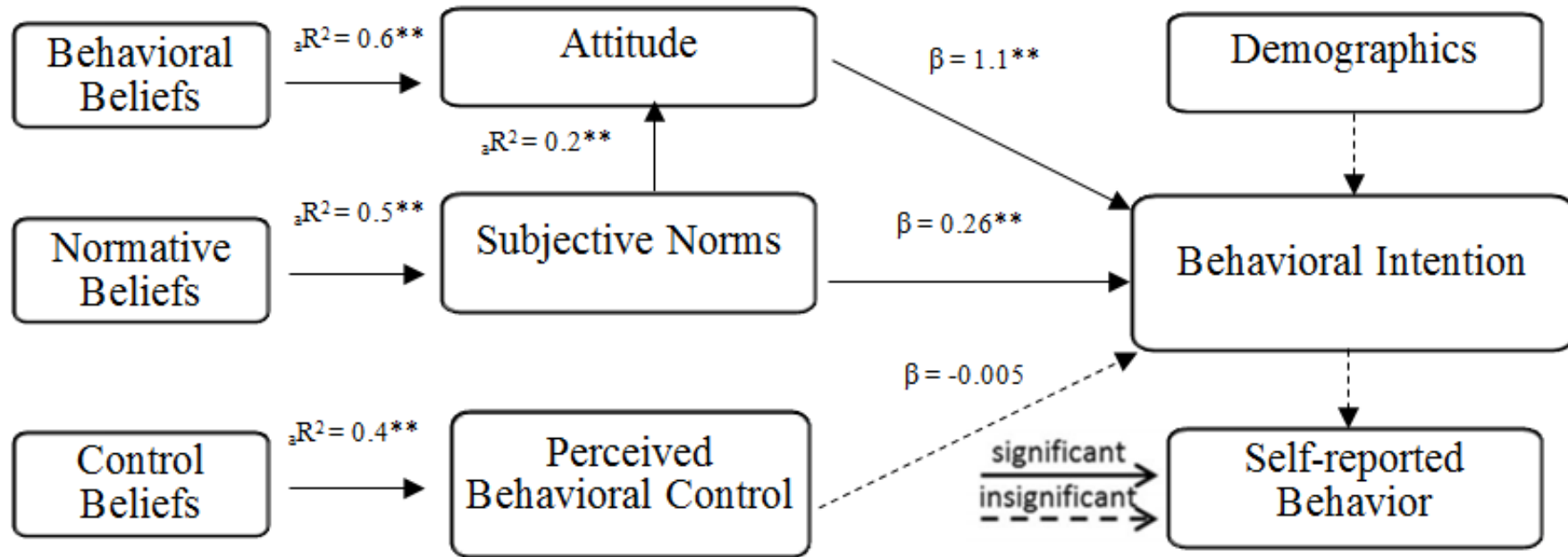
Responses were coded on a 1 - 7 point scale with 1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = neither disagree or agree, 5 = somewhat agree, 6 = agree, 7 = strongly agree. Responses may not equal 100% due to non-response to a question

# Summary of Belief Items

Belief Items	Strength Mean $\pm$ SD <sup>a</sup>	Evaluation Mean $\pm$ SD <sup>b</sup>	Overall Beliefs Mean $\pm$ SD <sup>c</sup>
<i>Behavioral Beliefs (a = 0.75)</i>			
To do something positive for myself	5.2 $\pm$ 1.6	2.0 $\pm$ 1.2	10.9 $\pm$ 7.7
To avoid illness	4.9 $\pm$ 1.6	1.9 $\pm$ 1.5	10.3 $\pm$ 8.0
<i>Normative Beliefs (a = 0.82)</i>			
My family and friends	4.5 $\pm$ 1.6	1.2 $\pm$ 1.6	6.6 $\pm$ 7.5
Doctor and nurses	5.5 $\pm$ 1.4	1.0 $\pm$ 1.5	6.4 $\pm$ 9.0
Other soldiers	4.3 $\pm$ 1.6	-0.4 $\pm$ 1.8	-0.8 $\pm$ 8.5
<i>Control Beliefs (a = 0.73)</i>			
Availability of hand sanitizers	3.7 $\pm$ 1.9	1.4 $\pm$ 1.5	5.7 $\pm$ 7.0

a. Strength means were measured on a 1 to 7 scale, SD = Standard Deviation; b. Evaluation means were measured on a -3 to +3 scale; c. Overall belief mean represents the mean of each strength item multiplied by each of the responding evaluation items, total score possible (- 21 to + 21). bb = Behavioral Beliefs, be = Behavioral Beliefs, nb = Normative Beliefs, mc = Motivation to Comply, cb = Control Beliefs, pp = Perceived Power

# Regression Analysis



Note.  $\text{aR}^2$  = Adjusted R Square;  $\beta$  = Standardized Coefficients; \*\* $P < 0.01$

# Hypothesis Results

Hypotheses	Path	Correlation	Result
H <sub>1</sub>	Attitude → BI	$\beta = 0.70^{**}$	Supported
H <sub>2a</sub>	SN → BI	$\beta = 0.5^{**}$	Supported
H <sub>2b</sub>	SN → Attitude	${}_aR^2 = 0.20^{**}$	Supported
H <sub>3</sub>	PBC → BI	$\beta = -0.005^*$	Not Supported
H <sub>4</sub>	Behavioral Belief → Attitude	${}_aR^2 = 0.40^{**}$	Supported
H <sub>5</sub>	Normative Belief → SN	${}_aR^2 = 0.25^{**}$	Supported
H <sub>6</sub>	Control Beliefs → PBC	${}_aR^2 = 0.13^{**}$	Supported
H <sub>8</sub>	BI → SRB	$R = 0.7^{**}$	Supported

Note: BI = Behavioral Intention; SN = Subjective Norm; PBC = Perceived Behavioral Control; SRB = Self-reported Behavior;  $^{**}P < 0.01$ ;  $^*P > 0.5$ ;  ${}_aR^2$  = Adjusted R Square

# Theoretical Implications

- First conceptual and comprehensive measure of hand sanitation behavioral intention within military dining facilities.
- Explicit soldiers' personal beliefs identified:
  - E.g. Using sanitizers to avoid illness (Positive Attitude);
  - E.g. Social pressure from other soldiers (Negative Subjective Norms)



# Practical Implications

- If we bring change to one of the significant belief constructs from our result, we can improve hand sanitation intentions, then change the behavior
  - Soldiers view using hand sanitizers as positive behavior
  - Family and friends have the most significant social influence
  - Other soldiers have negative social influence





# Future Studies

- Longitudinal Observation Study
- Design Effective Future Intervention
  - Behavioral Expectation
  - Low vs Absolute Intender Intervention

# Limitations

- Clustered data within one military installation in the state of Kansas
- Cross sectional study might cause common cognitive bias
- Non-response bias



Questions?  
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