

# Wingman-Connect

## A Network Health Suicide and Depression Prevention Program for Air Force Trainees

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MEDICINE *of* THE HIGHEST ORDER



# Overview

- Context of Military Suicides
- Guiding Network Health Model
- Wingman-Connect Program
- Efficacy Trial – Findings
- Phase 2 Effectiveness/Implementation (in planning)

# Wingman-Connect

## Dept of Defense funding (2014): University/USAF partnership

- Build healthy connections, coping with transitions
- Test as universal prevention to reduce suicide risk in young enlisted
- Current strategies focus on high risk (detection, Tx, means safety)

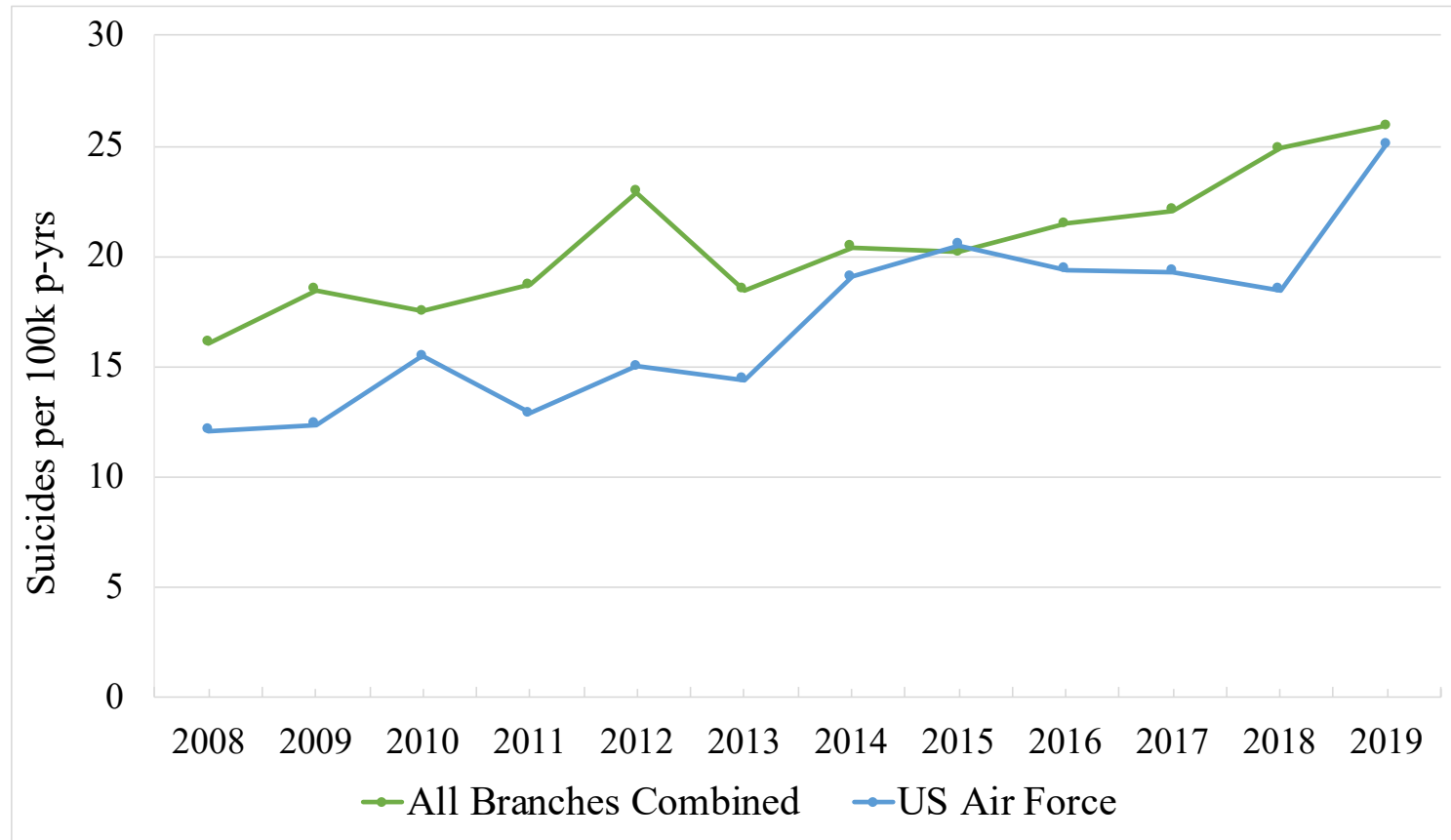
## Network-Health Approach

- Adapt network-informed Sources of Strength (LoMurray, 2005)
- Strengthens positive bonds, natural coping resources (Wyman, 2010)
- Active training model: Peer-to-peer teaching; diffusion of norms

## Relationships Disruptions Precipitants for Military Suicides

- Military service poses relationship challenges - separations, relocations-impact family, job readiness, health (IOM 2013)

# Military Suicide Rates 2008 – 2019



- Younger, enlisted Service Members population of greatest concern
- USAF Suicide Decedents: 83.4% have  $\leq 1$  deployments
- Active duty suicide rates comparable to US population after being lower for decades

DoDSER Reports 2013-2020

Air Force Times (August 1, 2019)

## **With deaths by suicide rising, Air Force orders resiliency stand-down**

Stephen Losey

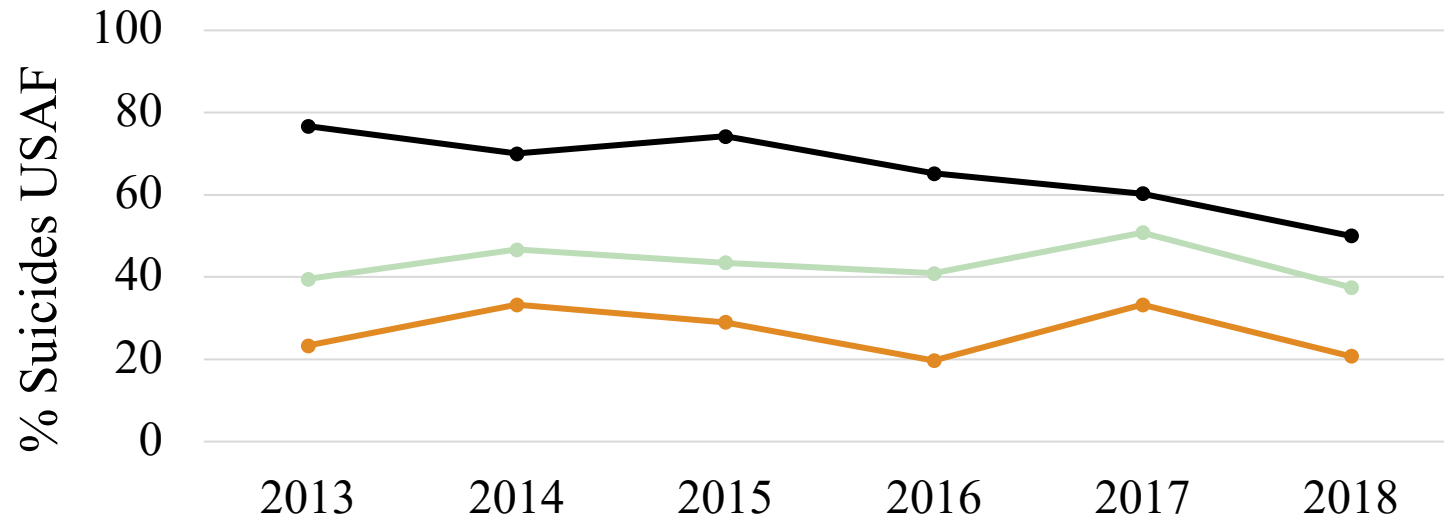
August 1, 2019

### **CMSAF Wright resiliency message to airmen**



*Chief Master Sergeant of the Air Force Kaleth Wright announces a one-day stand down to discuss resiliency and suicide prevention.*

# Why Universal Suicide Prevention in USAF?



- Communicated Suicidal Intent
- Mental Health Diagnosis (Ever)
- Any Health/Social Services Contact (90 days prior to event)

**Most suicide decedents did not communicate intent**

**Many outside identifiable high-risk groups**

**41.7% Failed/Failing Relationship in 2018**

# Challenge of Ecological Validity

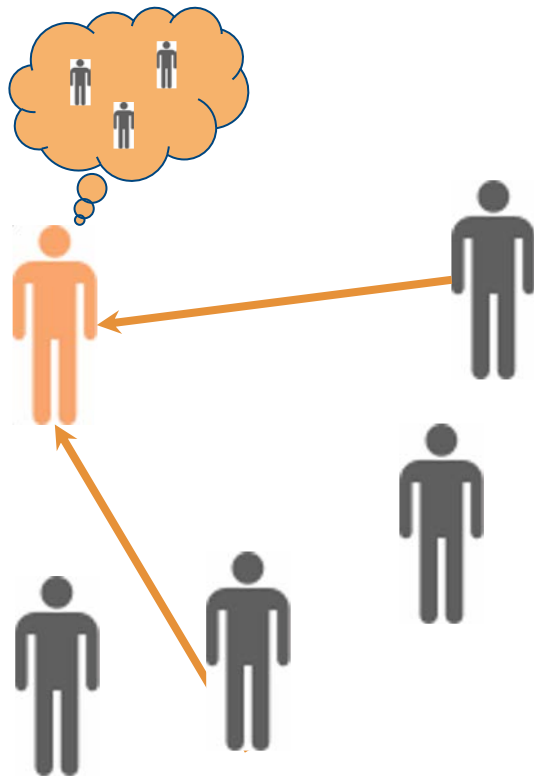
## Data-Informed Adaptation (Mar 2015-Dec 2016)

- Sheppard AFB Technical Training School; ~40,000 trainees/yr.
- Input: military training leaders, instructors, MH Wing, airmen-in-training
  - “death by PowerPoint”
  - “Check the box training”
- Pilot and refine modules with 10 cohorts, 352 Airmen-in-training

## What Increased Airmen Engagement & Retention?

- **Trainees’ Personal Motivations**  
career success, family traditions/needs
- **Class Unit Focus**  
group activities/skills, identity/pride
- **Distributed Learning**  
6 hrs. total over 3 days
- **Technical School (Squadron) Buy-in**  
Informal walk-arounds, orientations for instructors

# What is Network Health Model in Suicide Prevention?



## Individual Social Bonds

### ***Thwarted Belonging and STB***

(Van Orden & Joiner, 2011)

### ***Perceived connectedness***

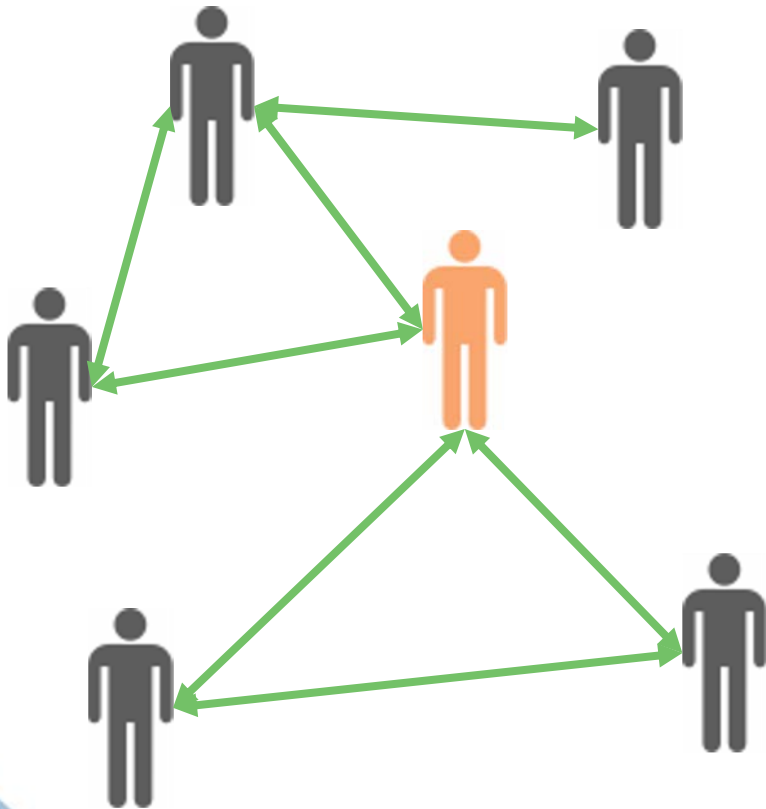
(Whitlock, Moore, Wyman, 2014)

### ***Integration in peer network***

(Wyman et al 2019)



# Network-Informed Suicide Prevention



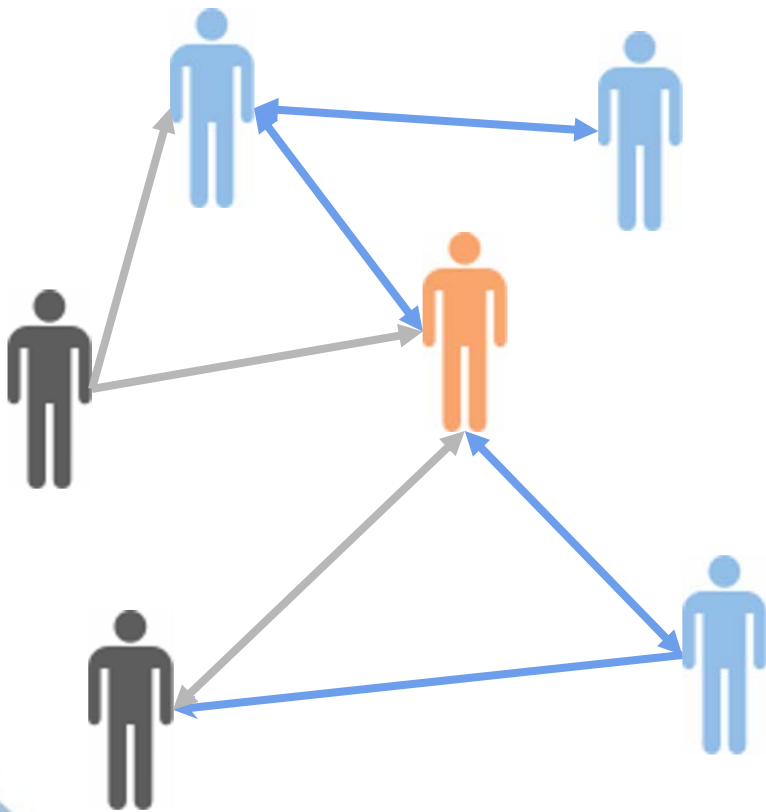
## Group Structure

***Cohesion protective in Army Units***  
(Mitchell et al., 2012)

***Lateral/horizontal cohesion***  
(Campbell-Sills et al 2020)

***Intergenerational cohesion*** (Wyman  
et al 2019)

# Network-Informed Suicide Prevention



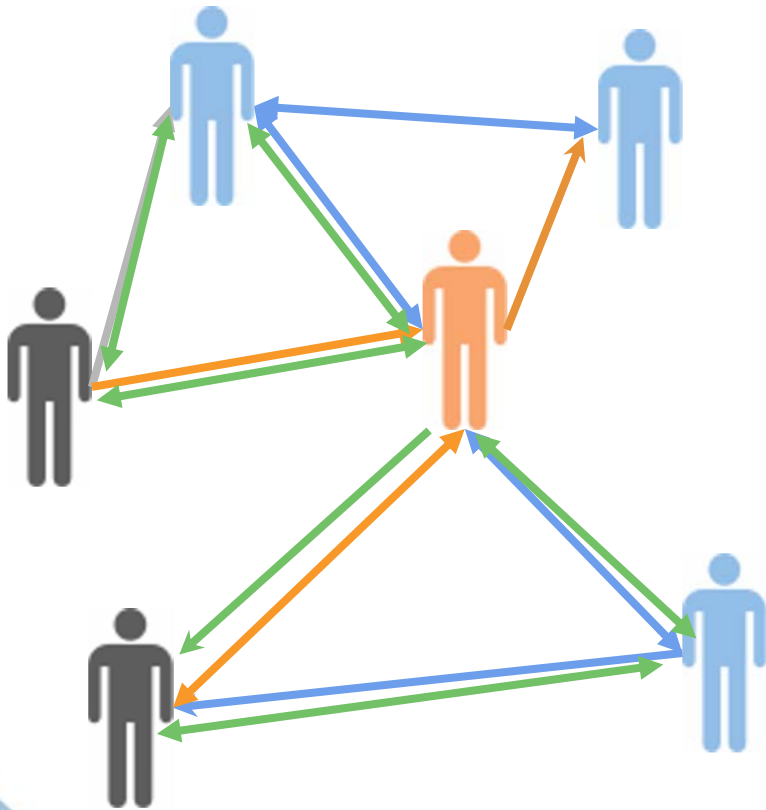
## Descriptive & Regulatory Norms

***Army Units w/ attempts*** (Ursano et al. 2017)

***Suicide attempt clustering*** (Wyman et al. 2019)

***Help-seeking acceptability*** (Pisani et al, 2012)

# Network-Informed Suicide Prevention



**Descriptive & Regulatory Norms**

**Group Structure**

**Individual Social Bonds**

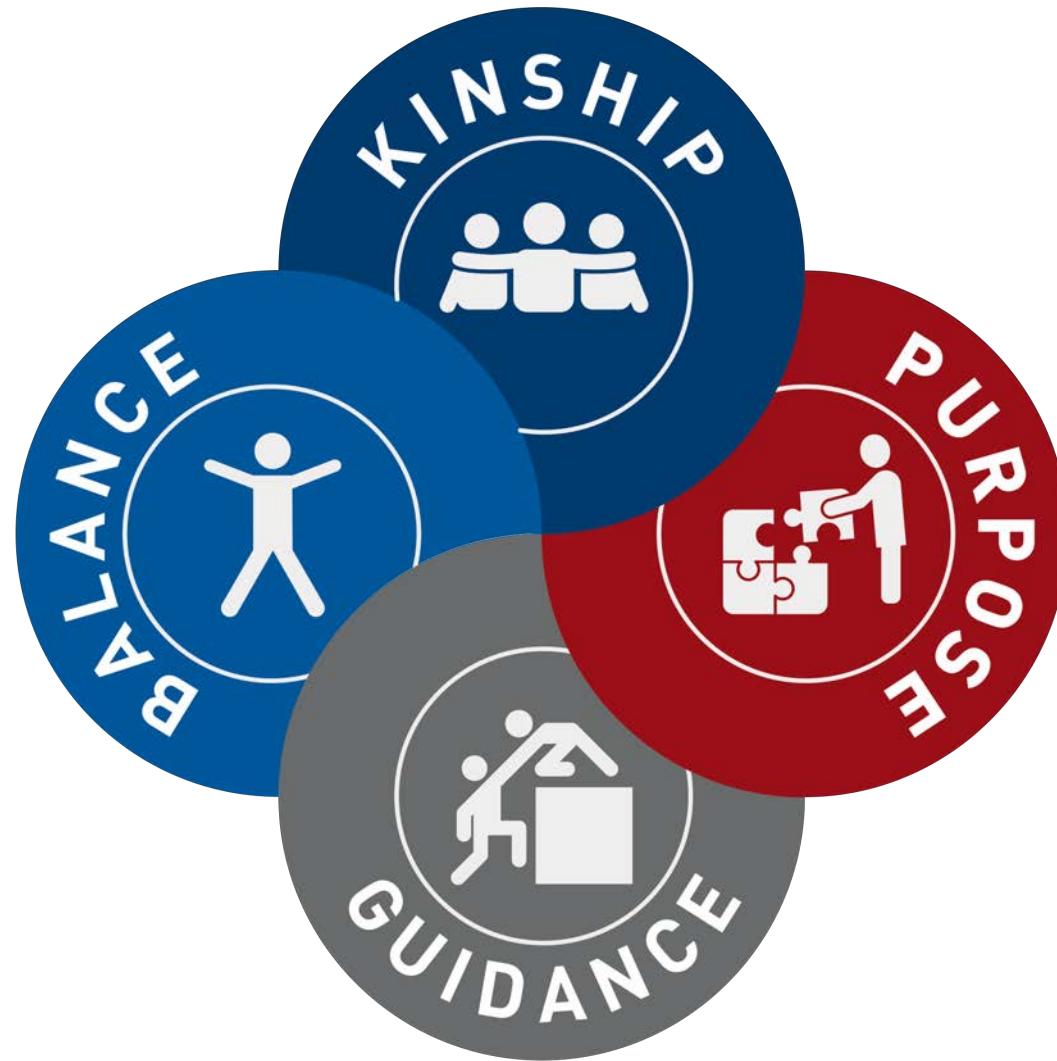
# *Wingman-Connect* with Airmen in Technical Training

## Manualized Training for Tech Class as Unit

- Organic unit (i.e. instruction, informal norms)
  - Struggling & strong AiTs
- 
- **Active Learning**
    - Each participant's goals-reasons for enlisting
    - High-energy activities
    - Draw out 'real-world' strengths
- 
- **Group and Individual Skills**



# WINGMAN-CONNECT FOUR CORES



# Wingman-Connect Structure and Emphasis

	Block 1	Block 2	Block 3	Post Training (6m Text/Vid Messaging)
Self-Appraisal of Four-Cores				
Strengthening Four-Cores				
Impact of Cohesive Healthy Network				
Strong Four-Cores in Class				
<i>Application and Transition to Operational AF</i>				

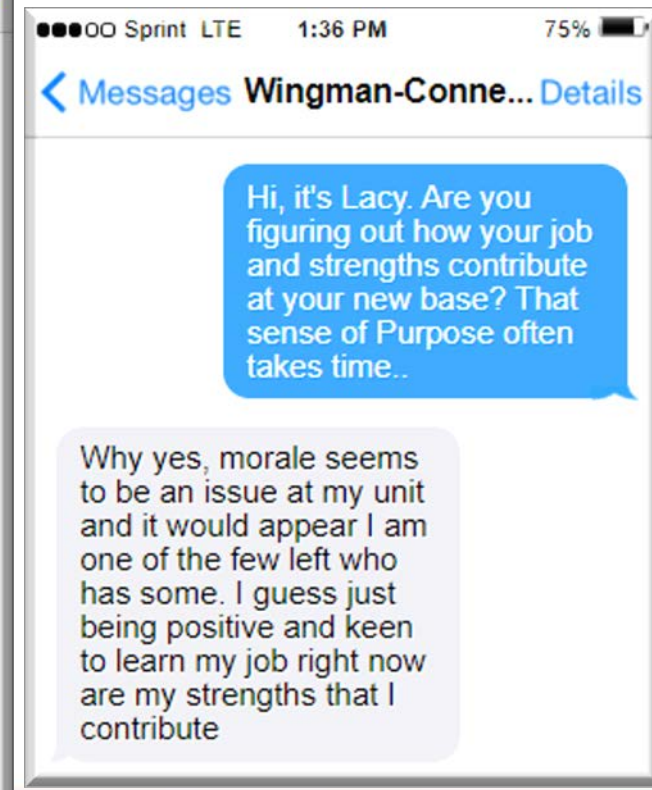
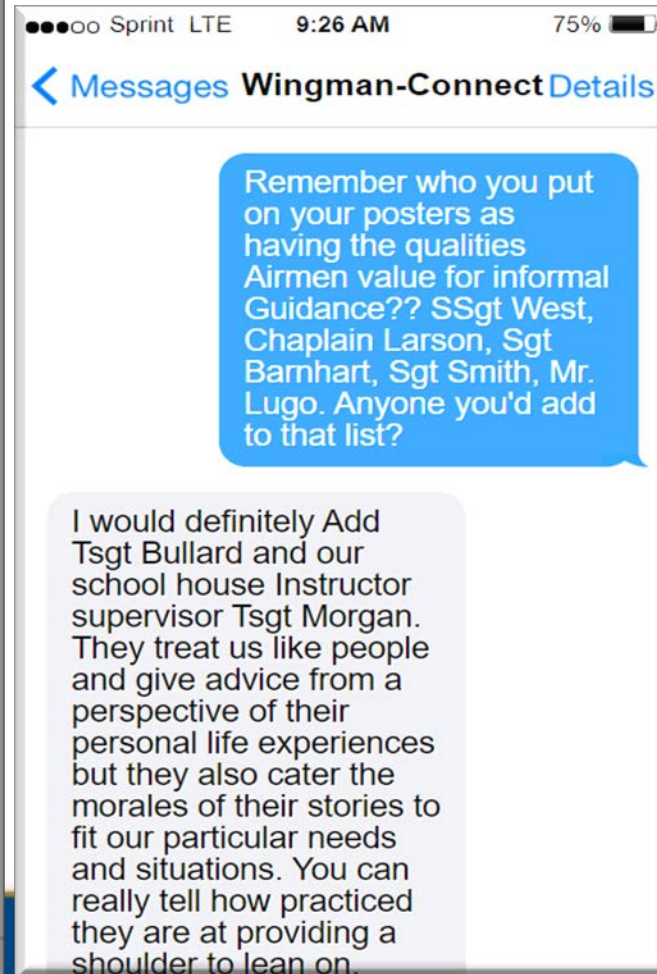
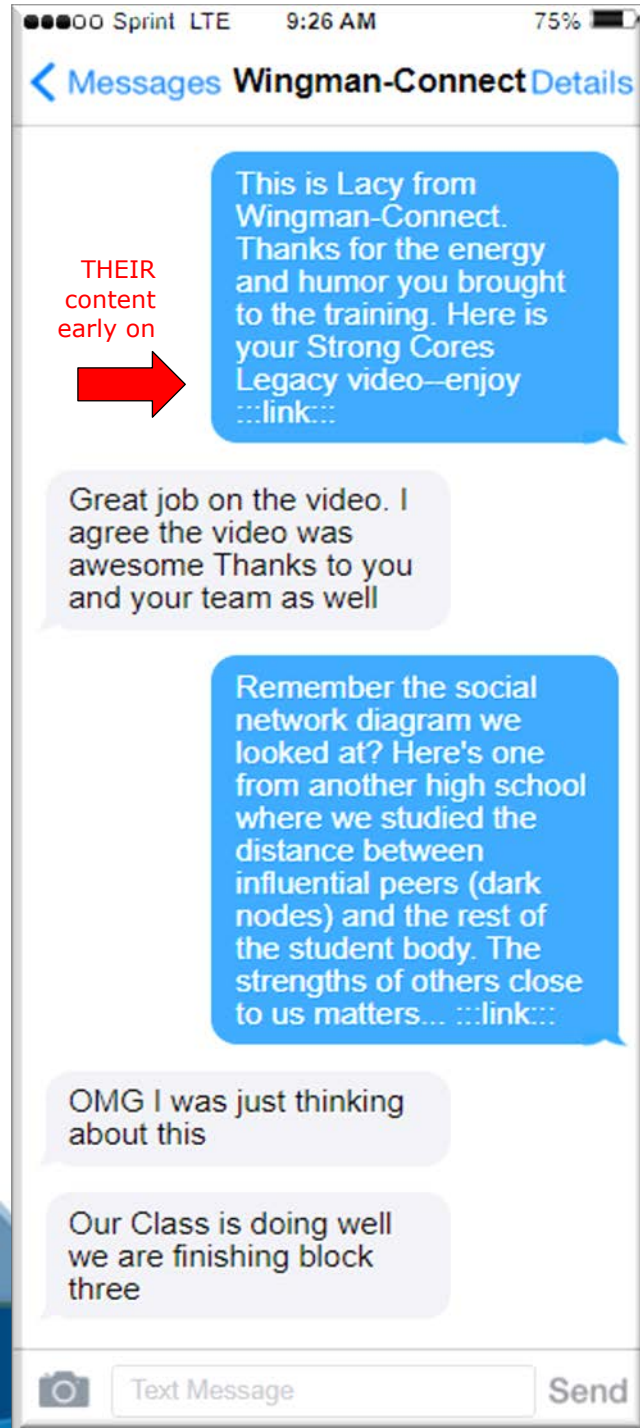
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## Text/Video Messaging – 6m

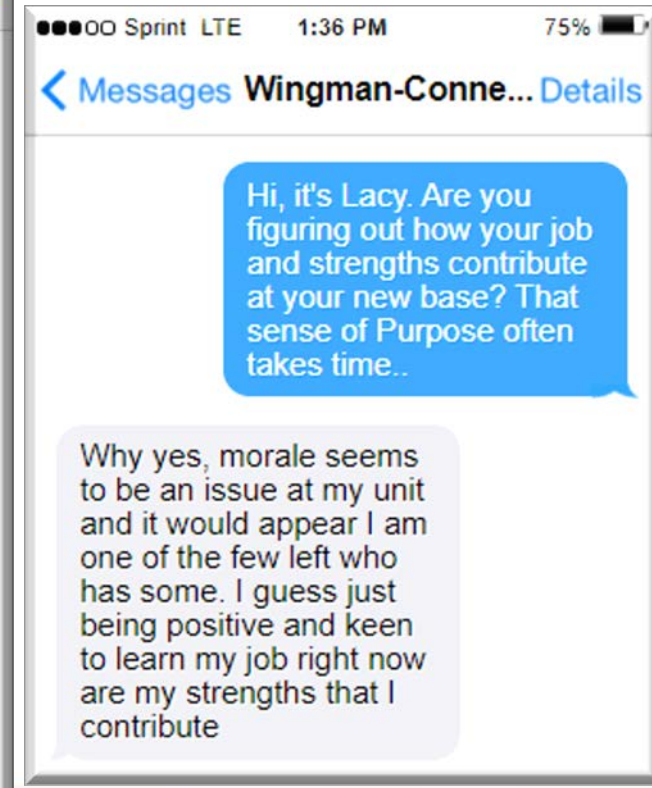
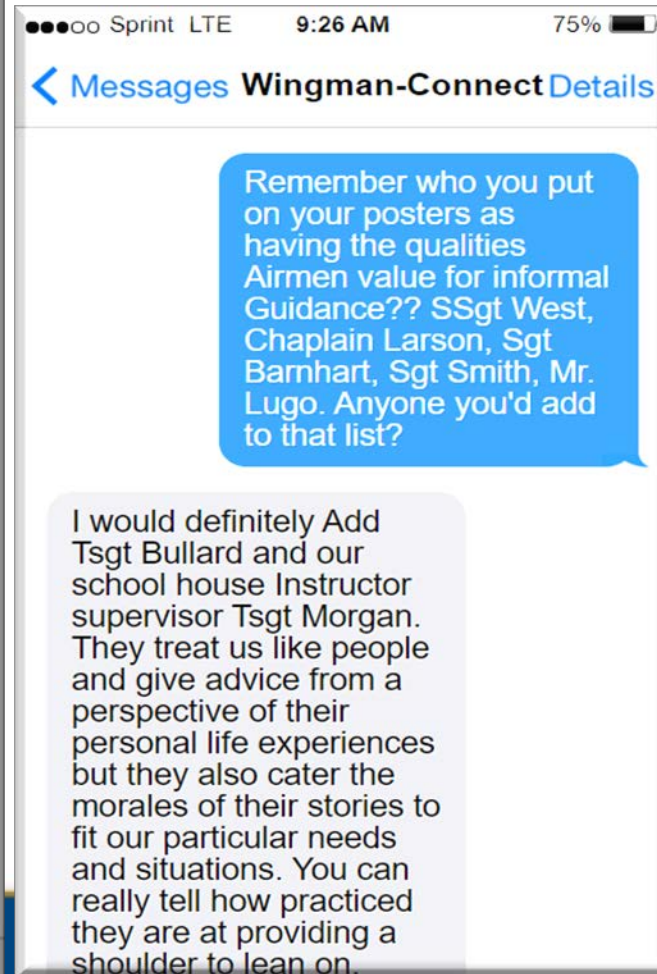
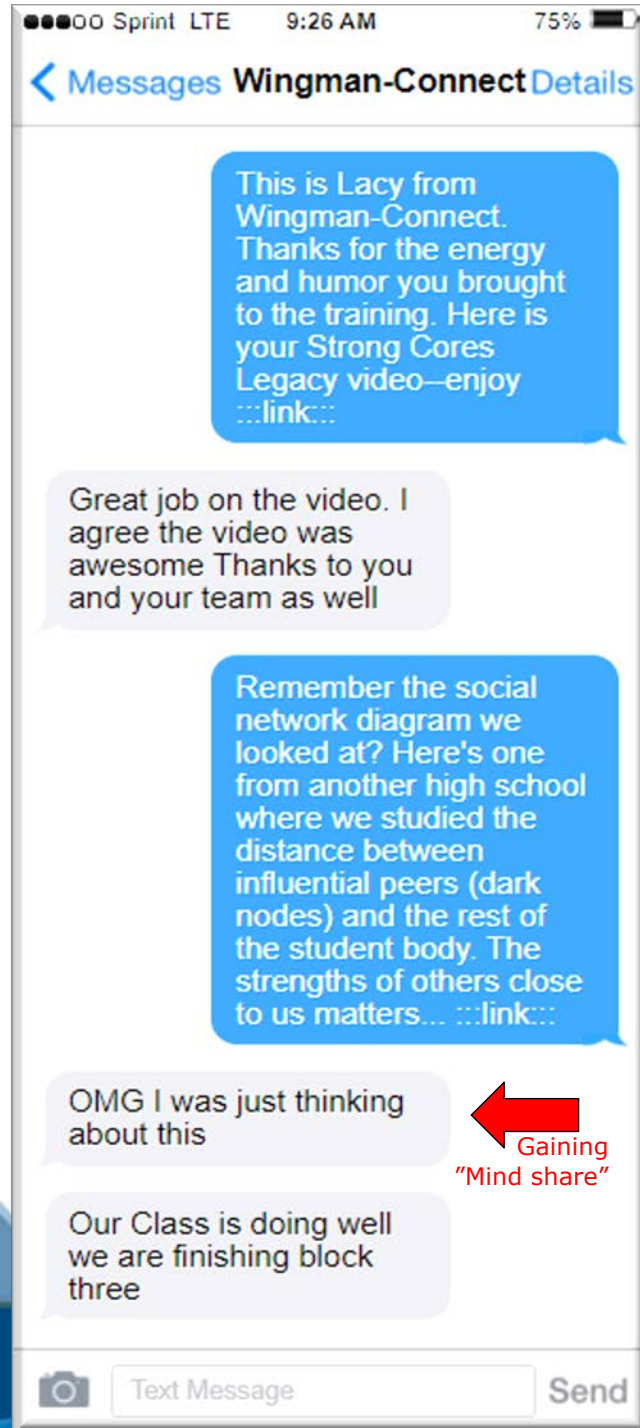
Reinforce intervention and group norms through personal application (Pisani et al 2019) and peer testimonials (Pisani et al 2018)





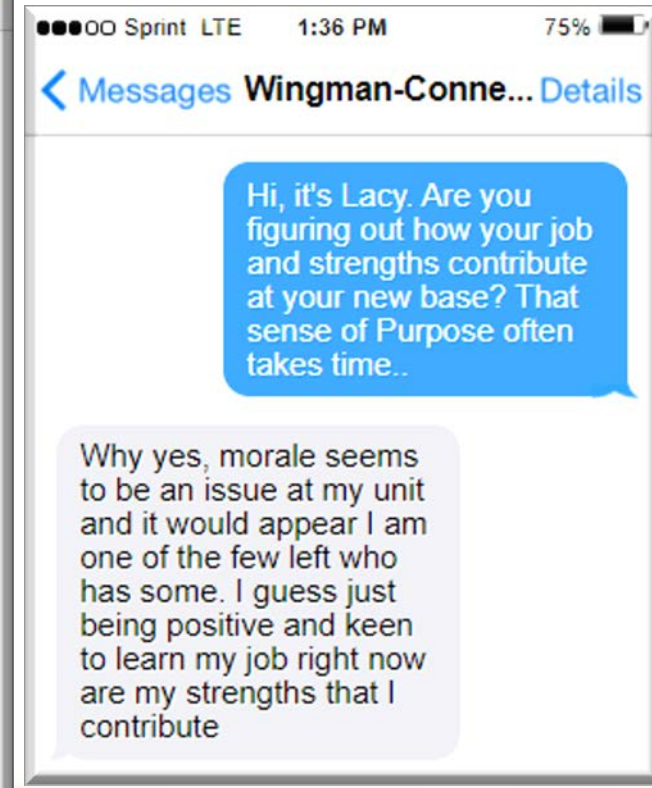
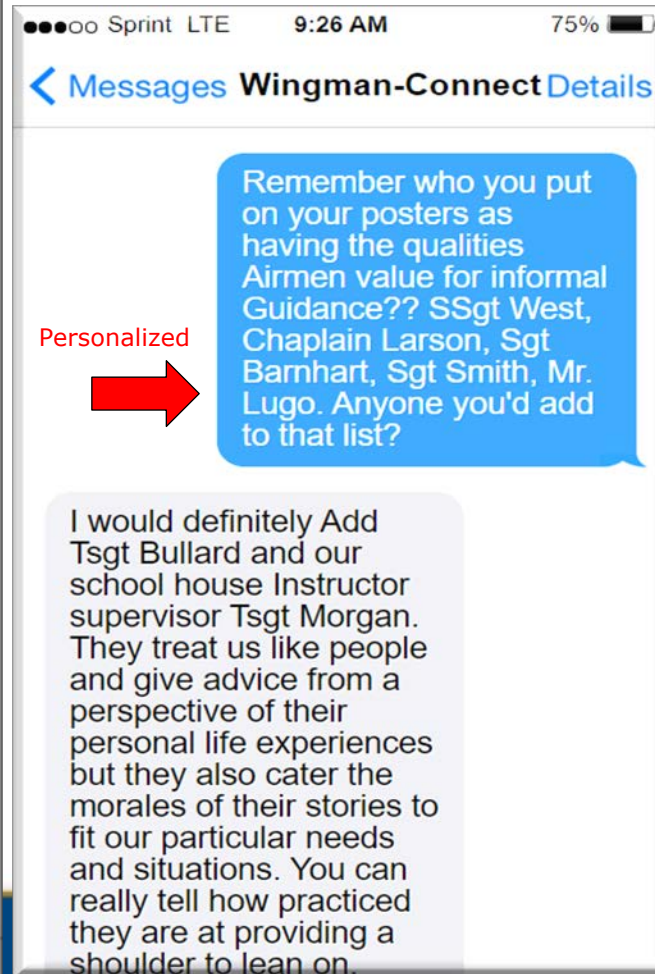
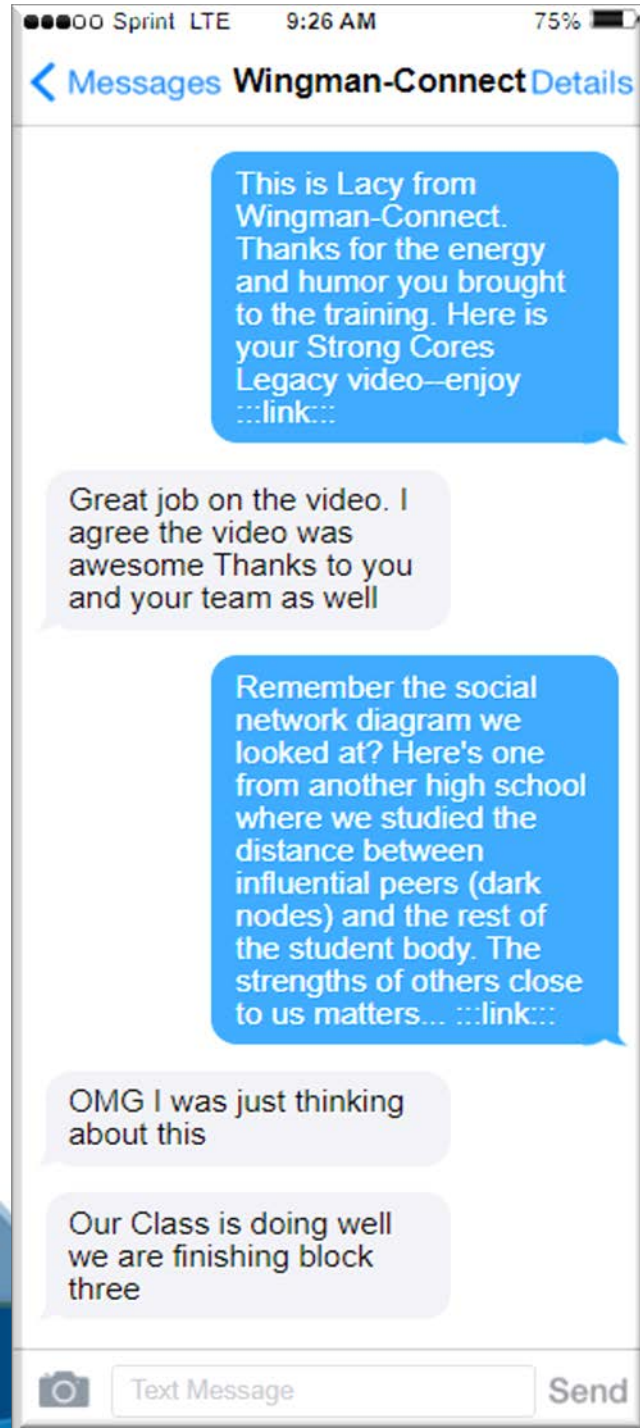
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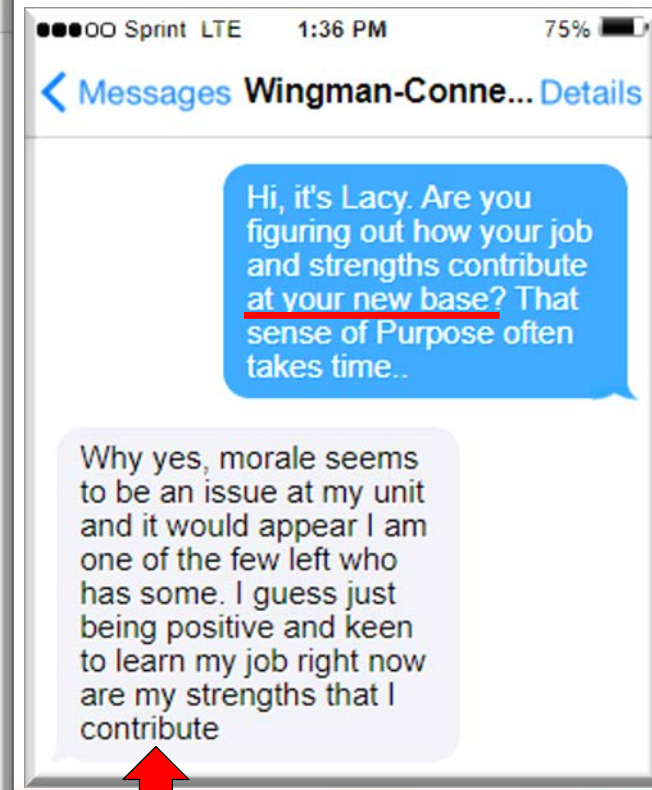
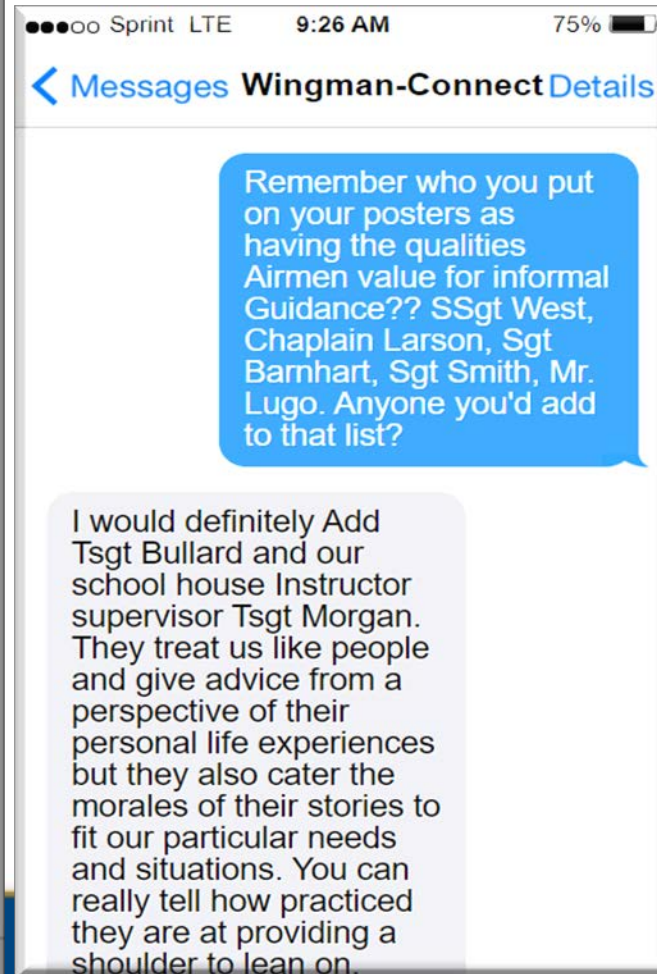
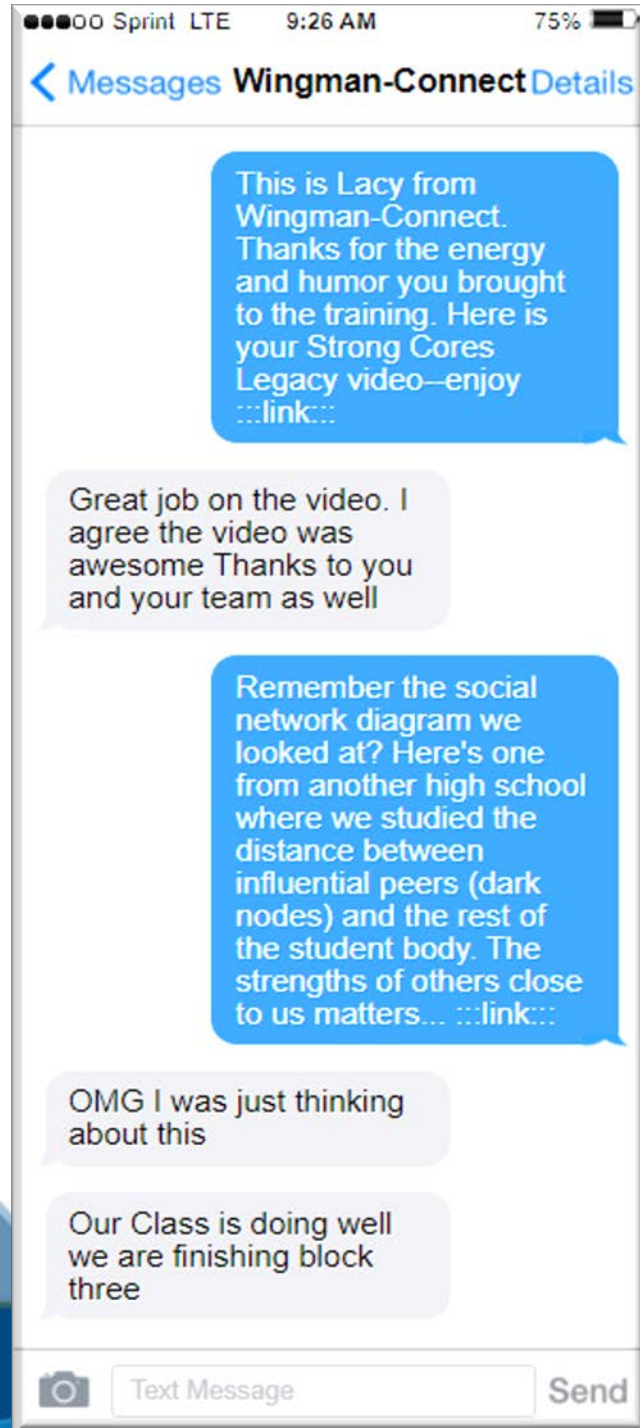
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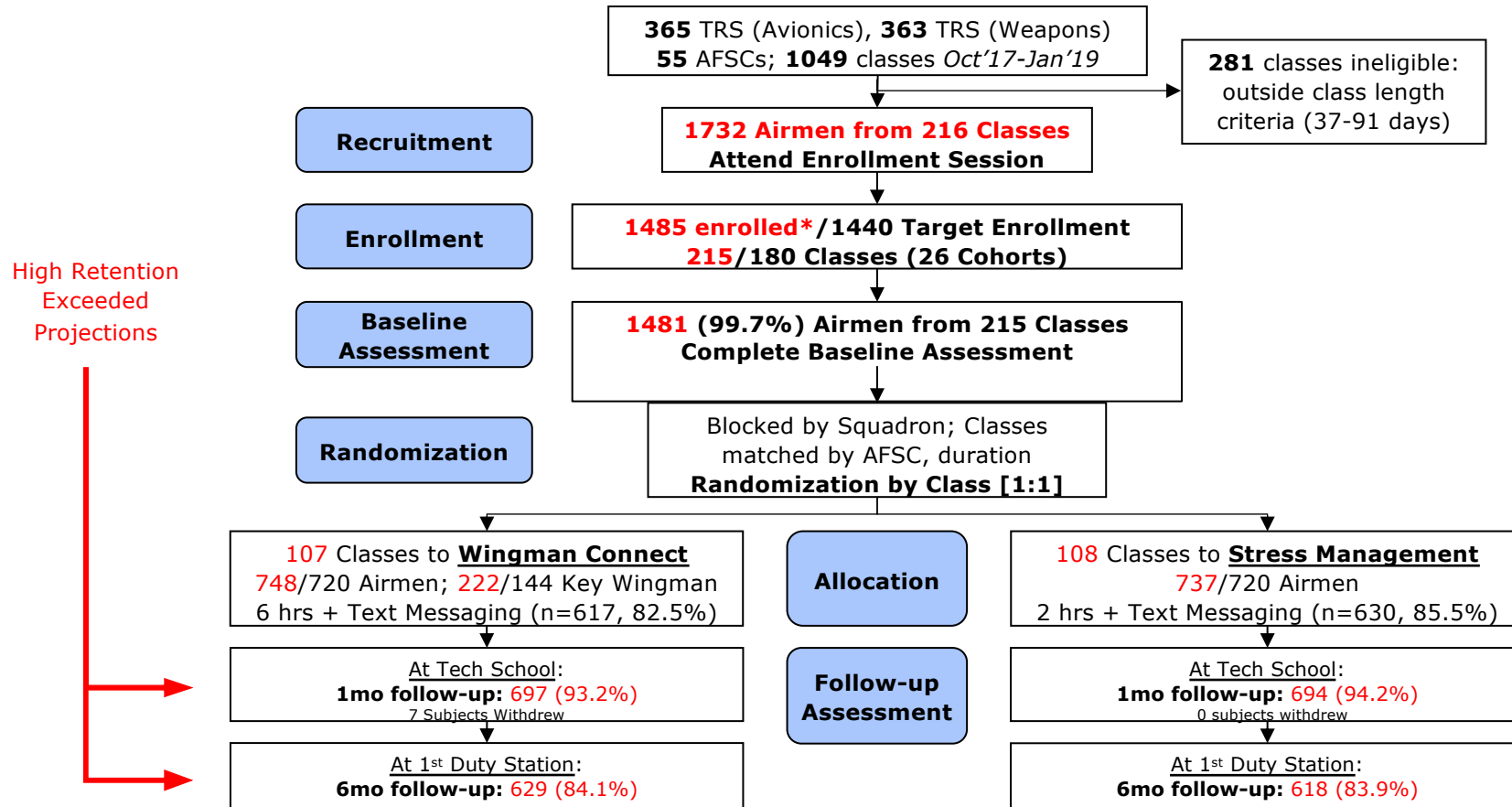
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Reinforce intervention and group norms through personal application (Pisani et al 2019) and peer testimonials (Pisani et al 2018)



Norm: Individual strengths  
→ GROUP Strength

# Randomized Trial Testing Wing-Conn Impact



# Wingman-Connect RCT: Measures/Hypotheses

## *Aim 1. Primary Outcomes:*

**Suicide Severity** (*CAT - SS*)

**Depression Symptoms** (*CAT - DI*)

CAT- Computerized Adaptive Test for Mental Health (Gibbons et al. 2012, 2017)

**Occupational Impairment:** Behavioral indicators (*Herrell et al., 2014*)

## *Aim 2. Hypothesized Mediators: Class Protective Factors*

**Cohesion** (*Podsakoff & MacKenzie, 1994*)

**Morale** (*Britt & Dickinson, 2006*)

**Class Healthy Behaviors & Norms** (*Wyman et al., 2019*)

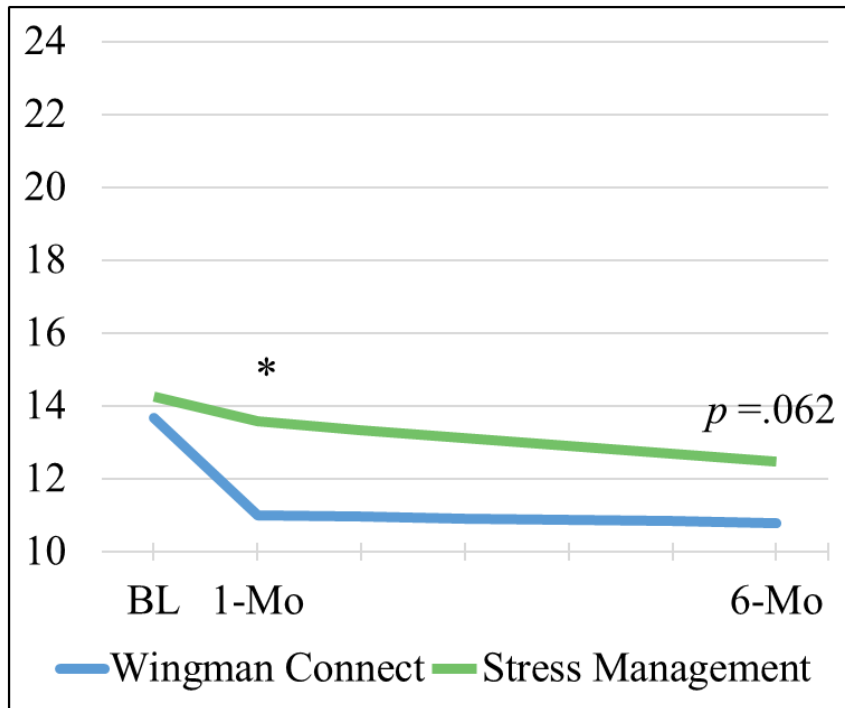
**Respectful Class Connections** – Class member nominations (*Valente, 2009*)

**Analyses:** Multi-level models: Effect of Wing-Conn vs. stress management conditioned on baseline measures (individual Airmen nested in class units).

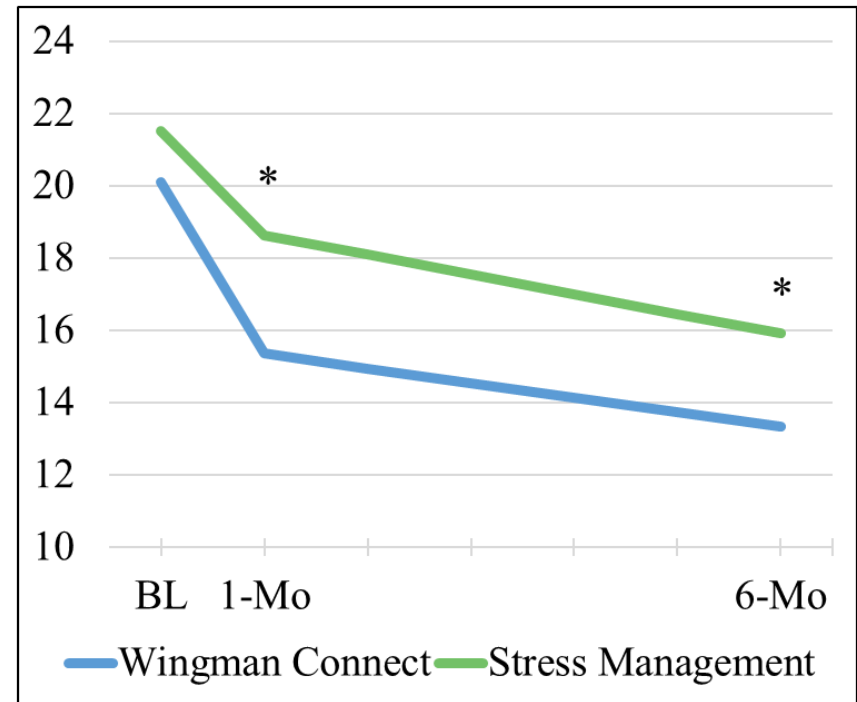
Covariates: gender, race, age, component (active duty vs. reserve, guard)

**Wingman-Connect Immediately Reduced Suicide Severity and Depression in Training**  
 Scores shown over 6-month study period, as assessed at Baseline, 1-Month, and 6-Months  
 Computerized Adaptive Test for Mental Health (CAT-MH; Gibbons et al 2017)

Suicide Severity Score



Depression Scale Score

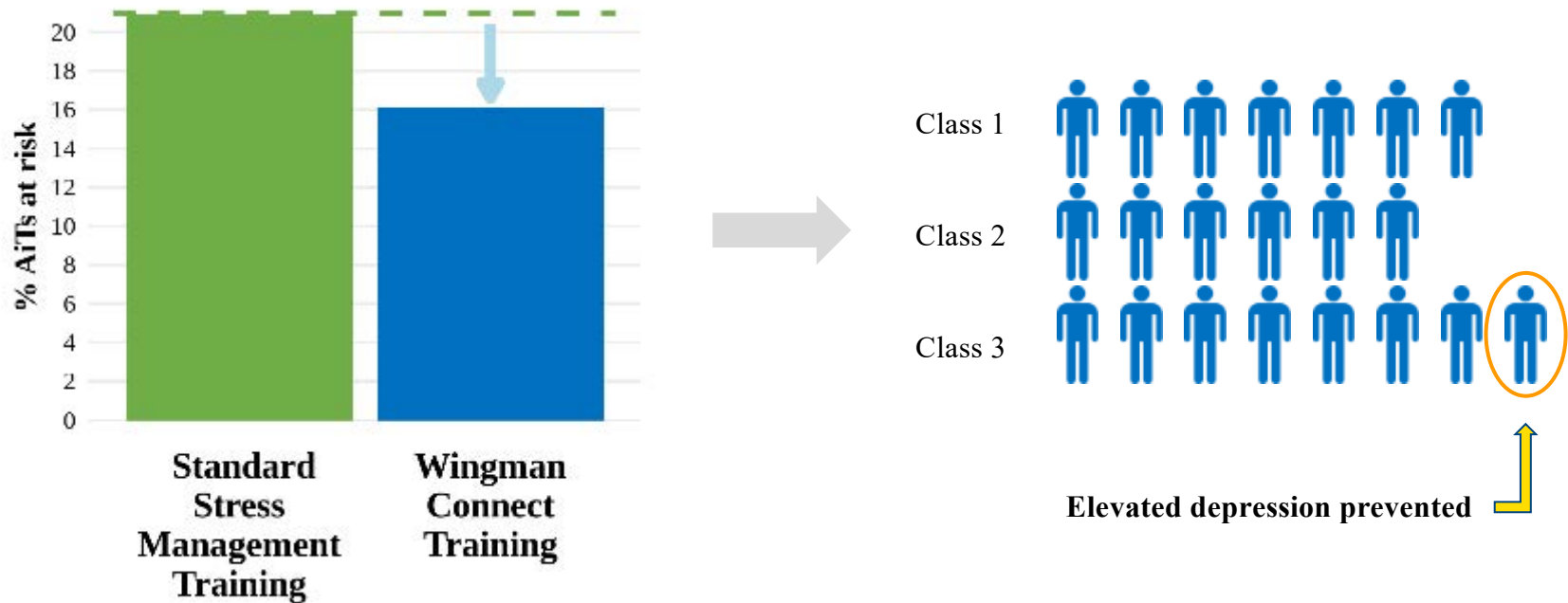


\*Wingman-Connect versus stress management training impact  $p < .05$

Wyman, Pisani, Brown, Yates, et al (2020) *JAMA Network Open*

# Wingman-Connect Reduced Elevated Depression

CAT-DI >35 = med-high probability of depression dx



Wing-Conn trained 20% less likely at 1- or 6-mo (OR: 0.80, CI:.64, .97, p=.011)

W-C: 16.1%; SM: 20.9%

**NNT:** Training 21 AiTs in Wing-Conn will produce 1 less Airman at elevated depression risk vs expected

# Wingman-Connect Average Effect on Elevated Risk for SI

## CAT-SS >34 = high probability of SI



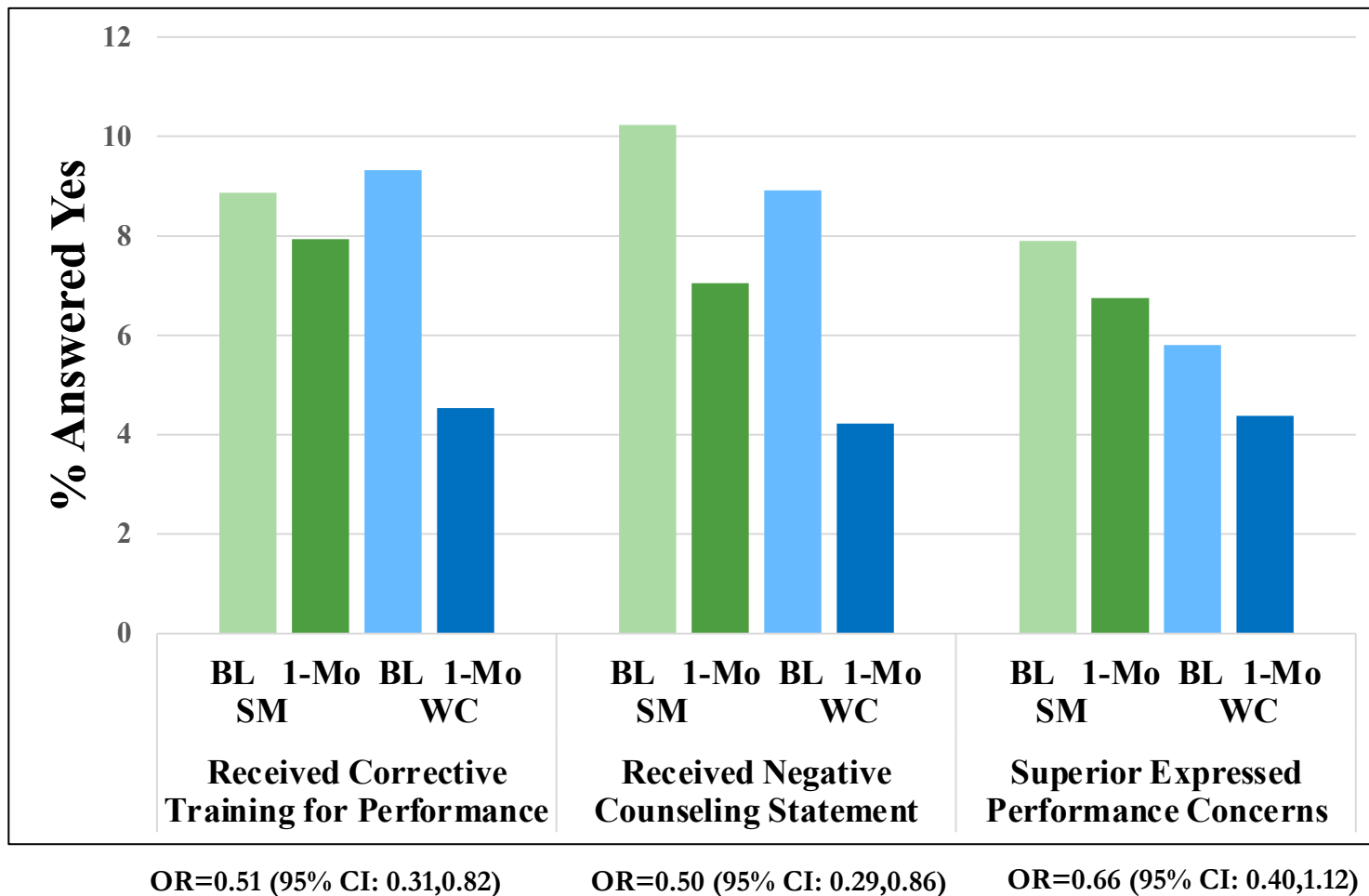
Wing-Conn trained 19% less likely at 1= or 6-mo (OR: 0.81, CI:.64, 1.07, p=.067)

W-C: 10.3%; SM: 12.6%

**NNT.** Training 44 AiTs in Wing-Conn will produce 1 less Airman at elevated suicide risk vs expected



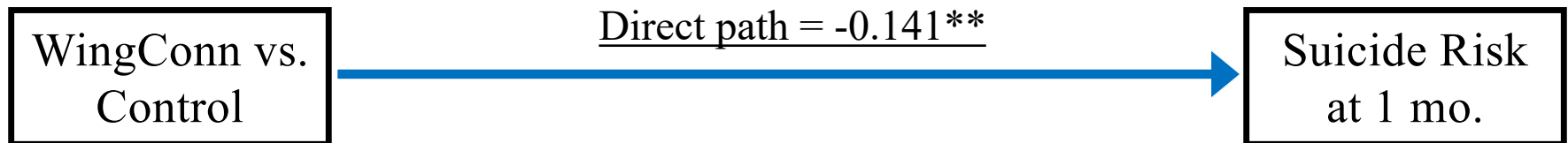
## Wingman-Connect Reduced Occupational Problems in Training



**Wingman-Connect trained had 49% and 50% decreased odds of reporting Corrective Training or Negative Counseling Statements in past 30 days versus Stress Management Training.**

Separated from AF: 7 in SM vs. 4 in Wingman-Connect

# Wingman-Connect Impact on Cohesive Healthy Class Reduced Suicide Severity at 1-month (mediator)

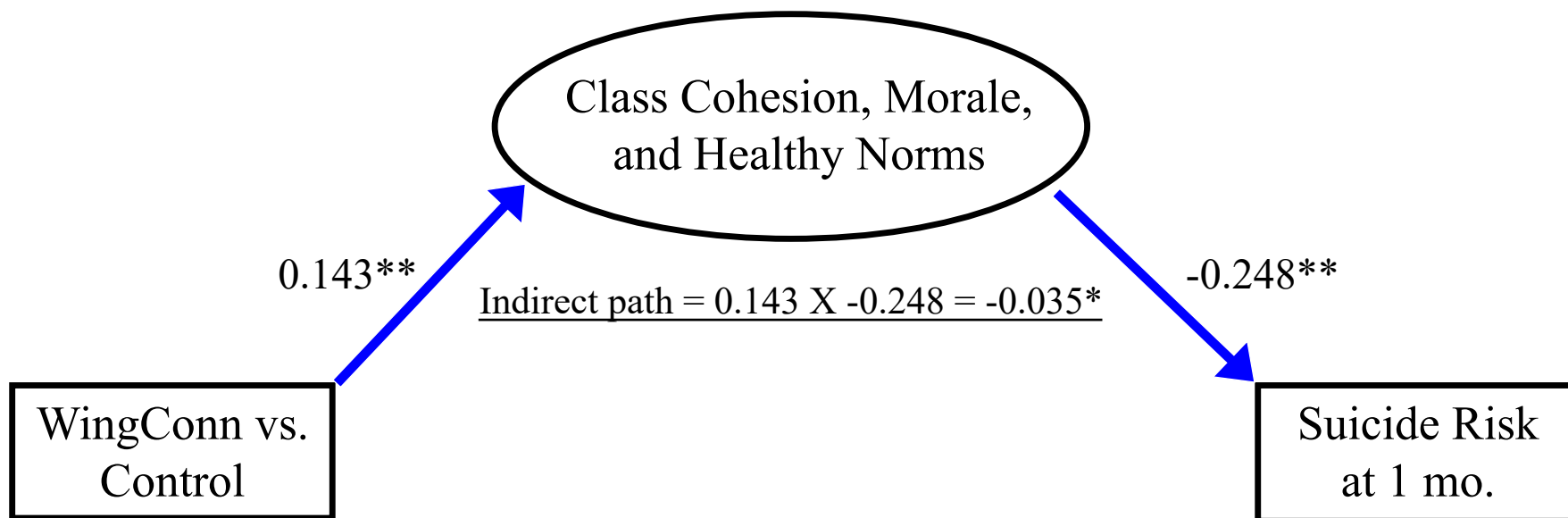


Note: Individual-level mediation (2-1-1 model).

Suicide Risk at baseline and covariates are controlled in model. Coefficients between training and cohesive thriving class and suicide risk at 1-mo indicate beneficial impact of W-C.

\*\*  $p < .01$  \* $p < .05$

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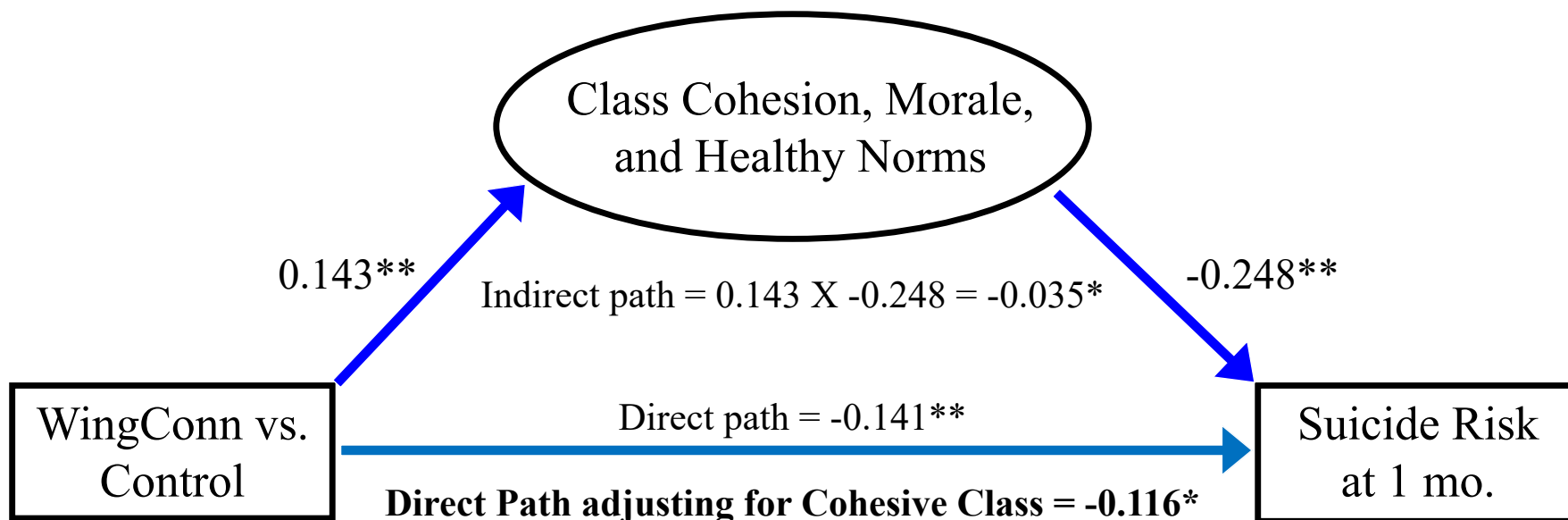


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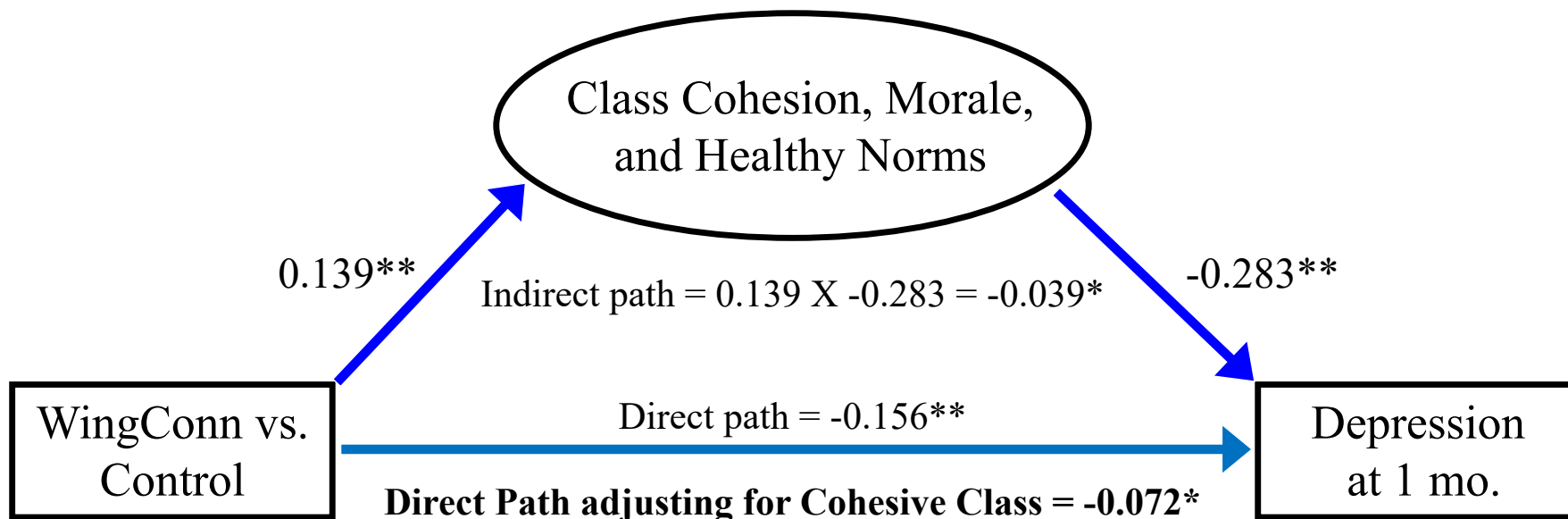


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# Wingman-Connect Impact on Cohesive Healthy Class Reduced Depression Symptoms at 1-month (mediator)



Note: Individual-level mediation (2-1-1 model).

Suicide Risk at baseline and covariates are controlled in model. Coefficients between training and cohesive thriving class and suicide risk at 1-mo indicate beneficial impact of W-C.

\*\* p < .01 \*p < .05

# **First universal program tested w/ RCT to reduce suicidal ideation and depression symptoms in general AF population**

## **Advantage of universal prevention where many will not seek help**

- Benefited Airmen higher and lower risk at baseline

## **Programs supporting mission and suicide prevention more sustainable**

- 50% reduction in work problems (tech training only)

## **Worked through expected mechanism-supports network health model**

- Cohesive healthy class reduced SI and depression
- Engaging units as a group may be **essential** for ecological validity

## **Expansion to operational USAF bases likely necessary, to promote protective working units for continuity of impact**

## **USAF approved expansion (horizontal/vertical) for further testing**

### **Limitations**

- No blinding of training condition
- Self-report (validated against clinical interviews)
- Trainers were research staff

# PROJECT TEAM

Peter A. Wyman, Principal Investigator

Anthony R. Pisani, Co-Investigator

C. Hendricks Brown, Co-Investigator

Eric Caine, Co-Investigator

Kerry Knox, Co-Investigator

Robert Gibbons, Co-Investigator

Mark LoMurray (Consultant)

Bryan Yates, Senior Project Coordinator

Lacy Morgan-DeVelder, Lead Trainer

Karen Schmeelk-Cone, Data Manager

Ian Cero, Data Analyst

Timothy McGowan, Trainer

Chelsea Keller, Prevention Specialist

Olivia Lewis, Trainer

Mariya Petrova, Trainer

## U.S. Air Force Partners

Col. Tracy Neal-Walden AFSG

Col. Steven Pflanz AFSG

Col. Wendy Travis AFMOA

Col. Chris Robinson, HAF/A1Z

363 & 365 Training Squadrons

Mrs. Jessica Ditson SAFB VPI

Lt Col. David Linkh AFSG

Lt Col. Kathleen Crimmins AFSG

Col. Alicia Matteson HAF/A1Z

Maj. Jordan Simonson HAF/A1Z

SMSgt Chris Vaughan

Mr. Lawrence Brown 363 Training Manager

# Effectiveness-Implementation (in progress)

Developing methods and process to study:

## •**Effectiveness:**

- Does Wing-Connect delivered by USAF reduce suicidal behavior?
- Implemented in training & operational AF bases (First Term Airmen Course)
- Optimize impact (to prioritize limited training resources if scaled up)
  - Impact if exposed in training, operational, or both?
  - Is impact increased as more co-workers trained (saturation, diffusion)?

## •**Implementation:**

- Leadership support required for effective, sustainable implementation
- Adapt G. Aarons' Leadership and Organization Change for Implementation (LOCI) measures/indicators
- Identify model to training USAF personnel to deliver



# Proposed: Participant flow in Hybrid Effectiveness/Implementation Study

## Technical Training School (TTS) at Sheppard AFB

Training Squadrons

362 TRS

B-1 Crew Chiefs\*  
B-52 Crew Chiefs\*

363 TRS

B-1 Armament\*  
B-52 Armament\*

364 TRS

Fuelers  
Aircraft Elec  
Aircraft Hydraulics

365 TRS

Heavy FC  
Heavy C/N  
Heavy EW

1600 Enrolled  
Randomly assigned  
800 W-C  
800 TAU

## 4 Global Strike Bases Receiving ~60% of Sample at First-Term Airmen's Course (FTAC)

*FTAC trains all incoming, including enrolled participants*

*Enrolled Subjects = ~20% total FTAC throughput*

Dyess AFB, TX

(120 W-C, 120 Control)

Ellsworth AFB, SD

(120 W-C, 120 Control)

Minot AFB, ND

(120 W-C, 120 Control)

Barksdale AFB, LA

(120 W-C, 120 Control)

Follow-up  
Assessments

4 Months

8 Months

12 Months

Graduation/PCS

# Randomized Step-Wedge Roll-Out of W-C on Operational Bases

Base #4

Base #3

Base #2

Base #1



Month 3

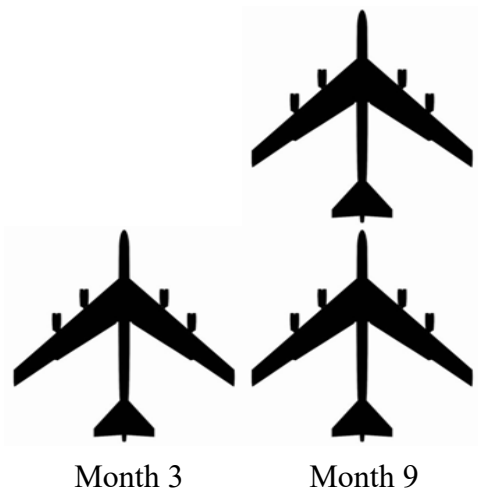
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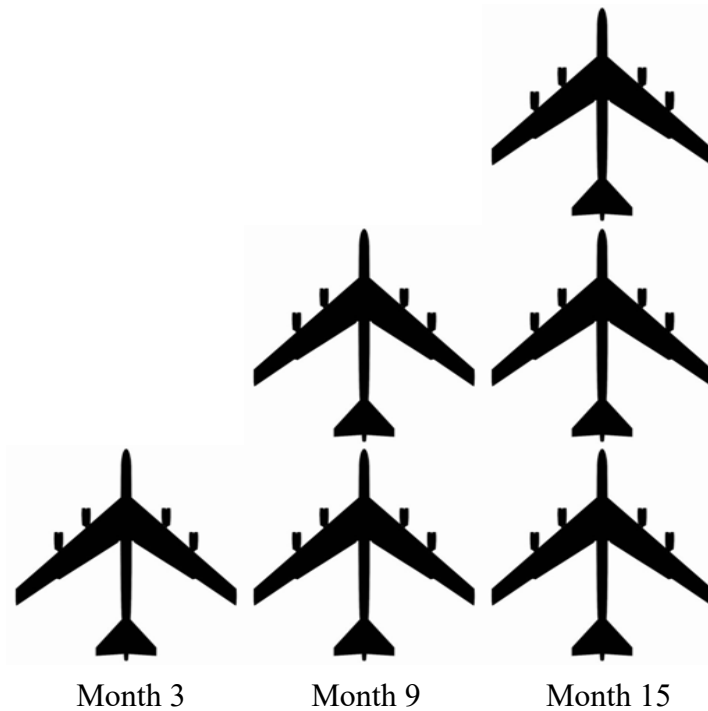
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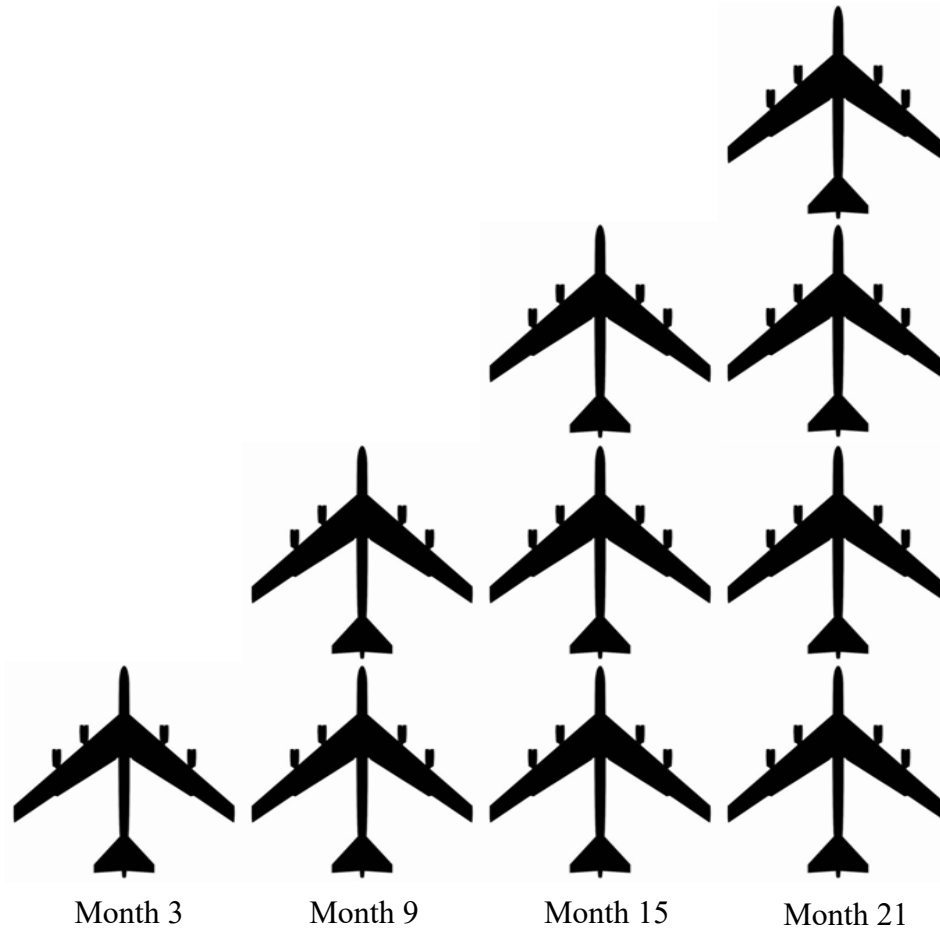
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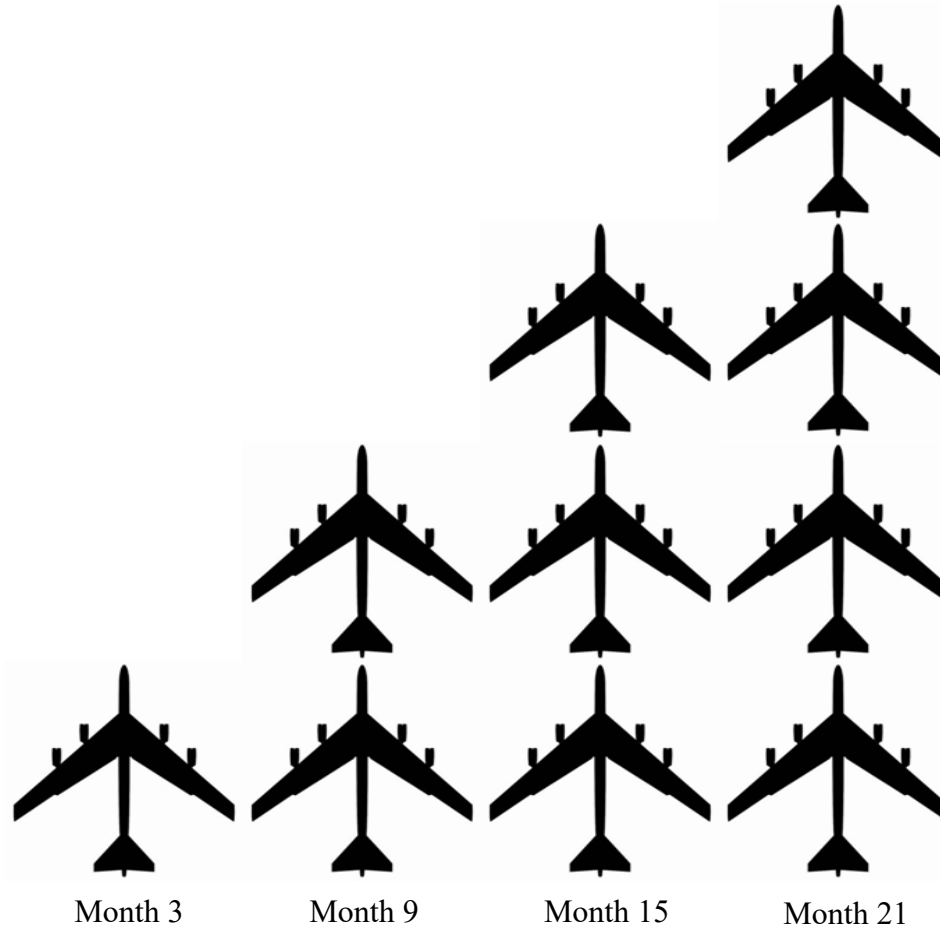
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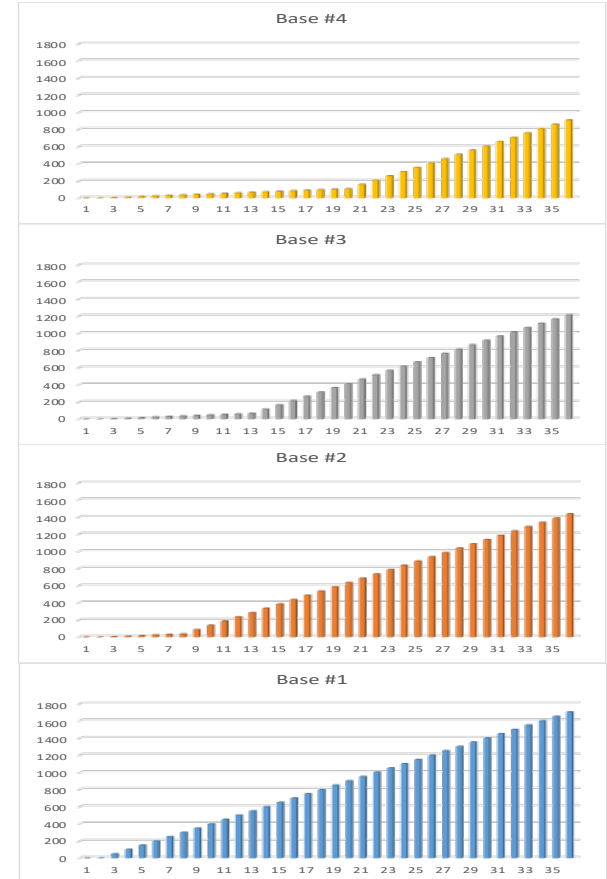
Base #3

Base #2

Base #1



TOTAL # Airmen trained at FTAC over 36 Months



TOTAL W-C trained across 4 Bases:  
 960 Enrolled  
 4,256 add'l FTAC Amn

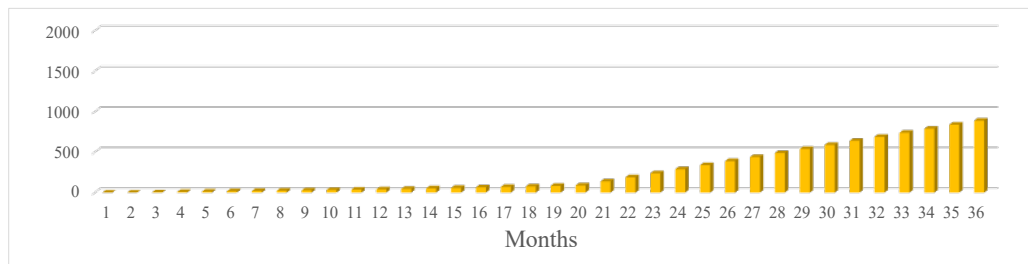
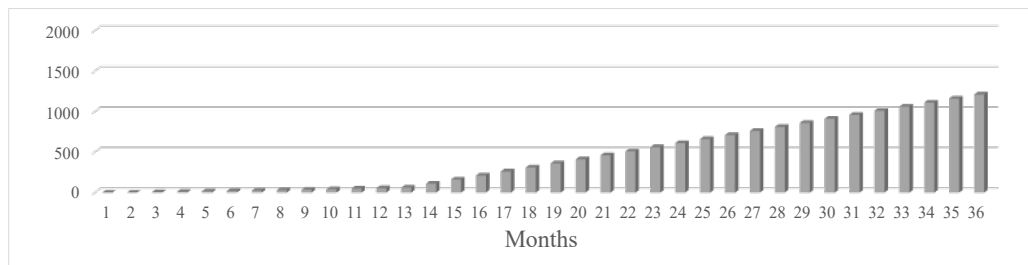
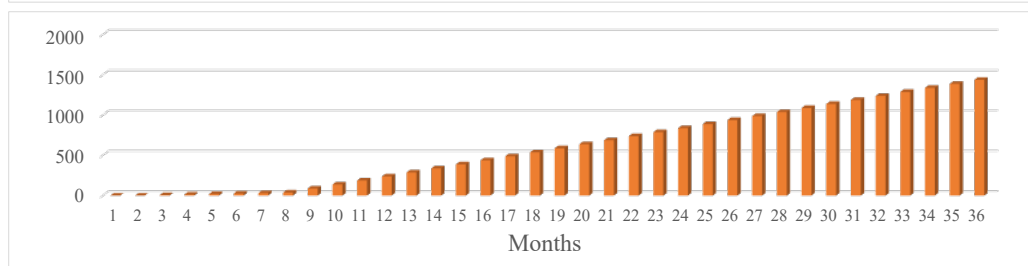
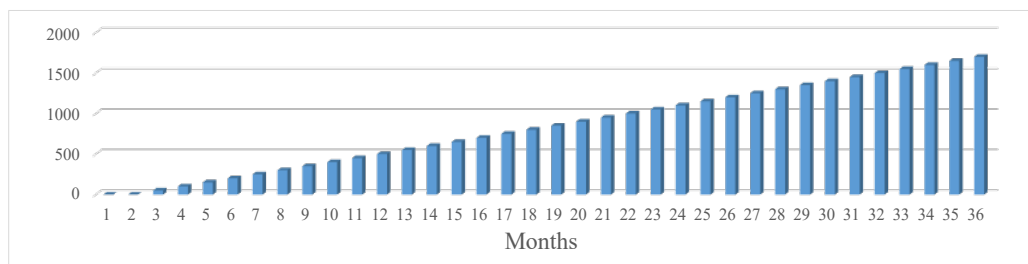
# Distribution of Wing-Conn Exposure at 36 months

Base #1	N
No Wing-Conn	0
Wing-Conn in TTS Only	0
Wing-Conn in FTAC Only	120
Wing-Conn in Both	120

Base #2	N
No Wing-Conn	30
Wing-Conn in TTS Only	30
Wing-Conn in FTAC Only	90
Wing-Conn in Both	90

Base #3	N
No Wing-Conn	60
Wing-Conn in TTS Only	60
Wing-Conn in FTAC Only	60
Wing-Conn in Both	60

Base #4	N
No Wing-Conn	90
Wing-Conn in TTS Only	90
Wing-Conn in FTAC Only	30
Wing-Conn in Both	30



Finding Ways to Fit Program and  
Delivery Improvement in  
Different Settings with Federal  
Research Mechanisms



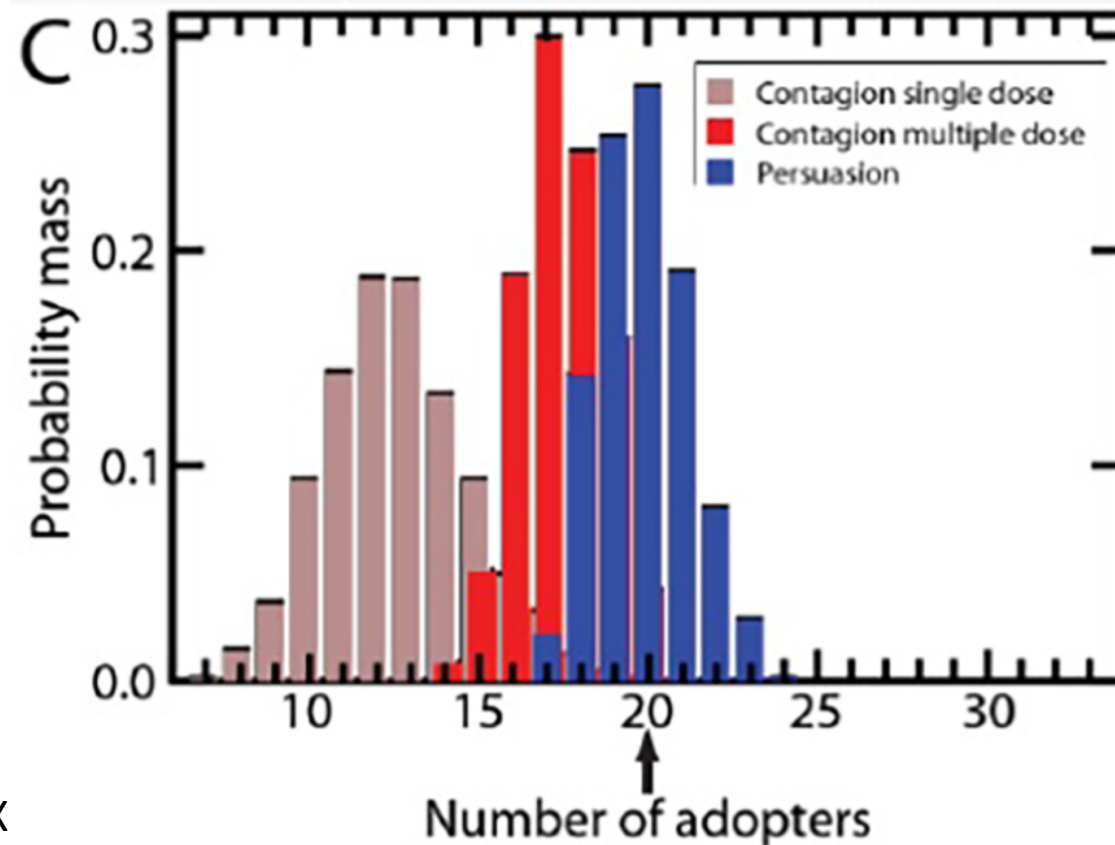
# Challenges

## “Scaling Out”

- Different Population, some of whom have had previous exposure
- Deliver in much different settings
- Mechanism of institutionalization is more expansive
  - Multiple exposures
  - See it in action “try it out and see if it works”
  - Diffusion across a hierarchical network (not peer leader diffusion)

# Multiple Exposure and Persuasion predicting number of adopters using simulation

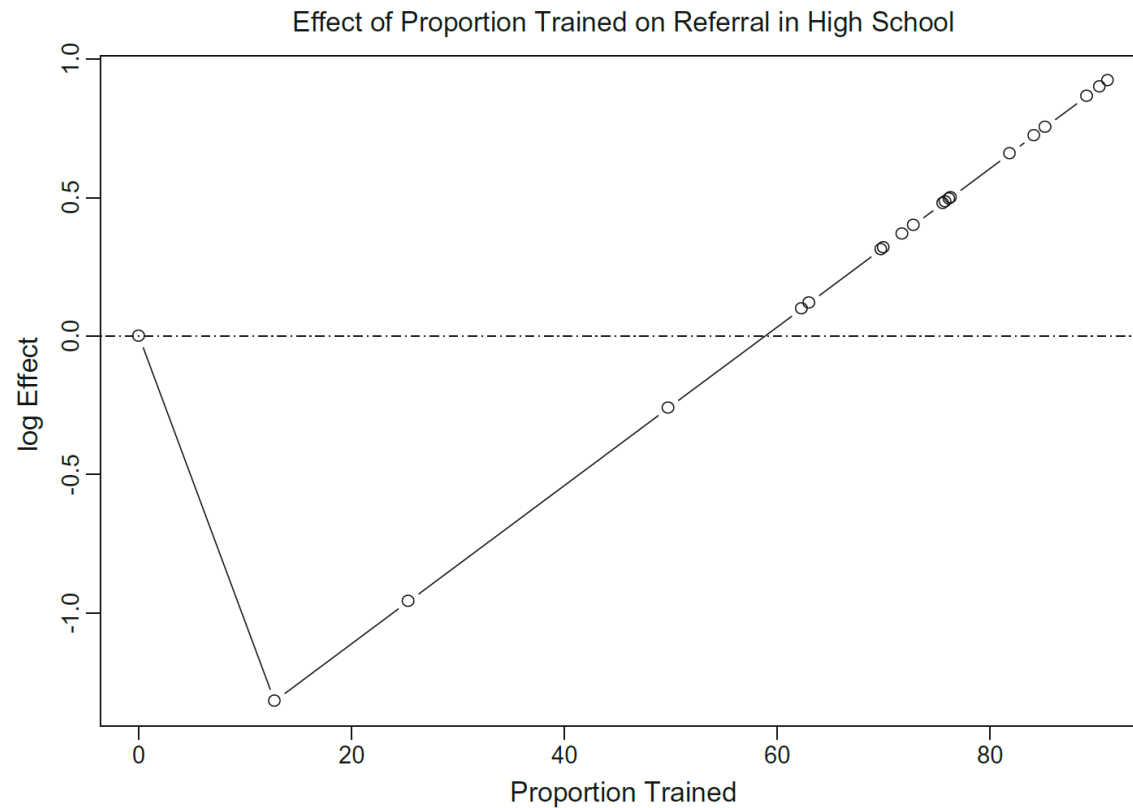
Figure 3. Comparing Fit of 3 Adoption Mechanisms



# Analytic Modeling of Diffusion: How does impact depend on training saturation?

Prev Sci

**Fig. 1** Effect of proportion trained in QPR on referrals in high school



Wyman et al., Prev Sci, 2014

# Scaling Out: How can we borrow strength from existing data on effectiveness?

- Use Cohesive Health Unit Scale: as a hypothesized climate mediator
  - Group Cohesion
  - Perceived Group Morale
  - Healthy Norms and Practices
  - Number of respectful connections