

Setting the Stage for Successful Convergence Research

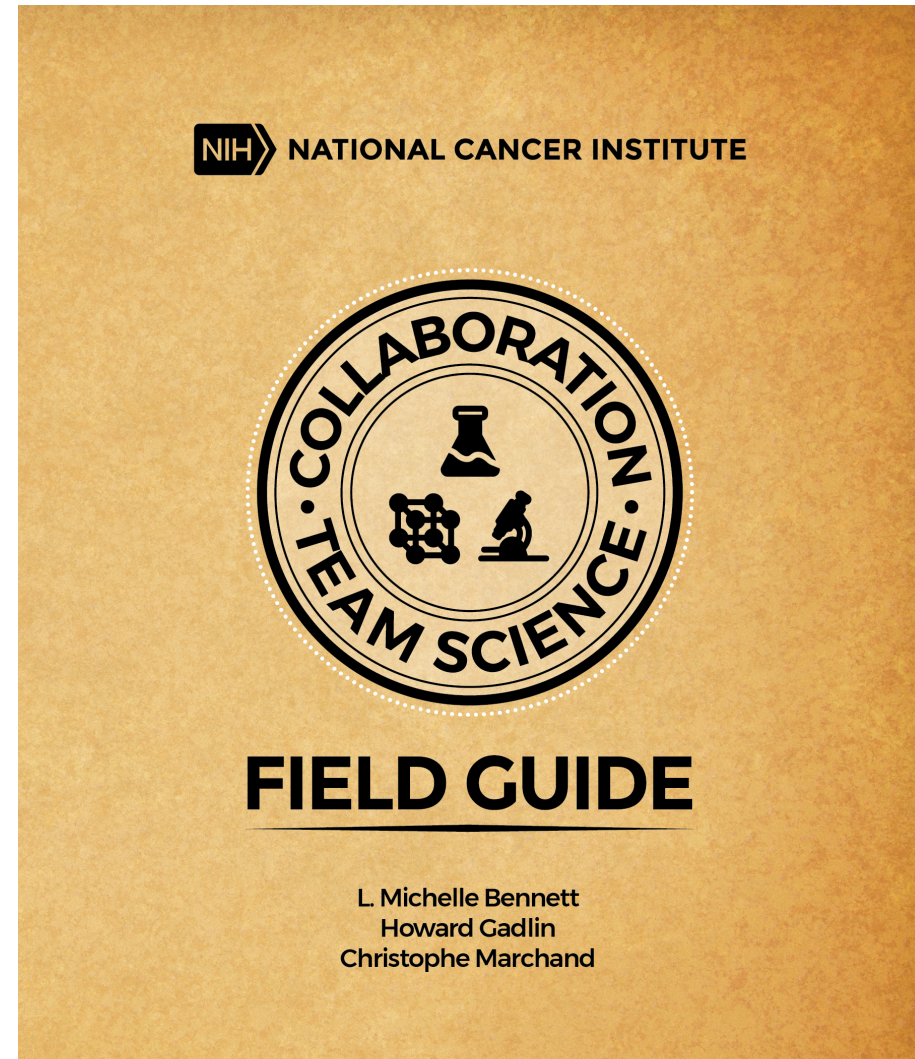
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Research Strategy, NCI*



Accelerating Engineering Research Center (ERC)
Planning Grant Workshop - *October 1, 2019*

What Characteristics Contribute to Successful Team Functioning?



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teamscience.nih.gov

Science
brings
teams
together....



Research Proposal Requirements...

Scientific Research Plan

- Acknowledgement of the complex nature of the scientific challenge
 - Intro, background, research plan, etc...

Collaboration Plan

- Providing information that enables the reviewers to understand:
 - Team Dynamics and Management
 - Training and mentoring philosophy in an era of team science
 - Leadership characteristics

Scientific Review: Team Science Expert

- Team member identification
 - Scientific background/expertise
 - Interests/motivations/”interviews”
- Team building and management
 - Establishing Trust
 - Setting Expectations
 - Team Development
- Effective leadership
 - Shared Vision
 - Research Plan
- Interdisciplinary/Transdisciplinary /Convergent
 - Disciplinary backgrounds relevant to complexity of the problem
- Engagement of community
 - Authentic?
- Communication skills
 - Internal/external
 - Managing conflict and promoting disagreement

*Note: together this information could establish a collaboration plan/agreement**

Team Formation: Descriptions in Grant Proposal

- a) Once I am funded, I will form the team. I will be the leader. I will outline the goals and objectives, and will give the team explicit directions in order to successfully achieve the goals and objectives of this project.

- b) The team is well established. We have been working together for years and are very comfortable together.

- c) I have reached beyond my comfort zone and identified individuals who are also interested in this complex problem. They represent a variety of disciplines ranging from close to the science, to expertise in the technological methods, to community level responsibilities.



Let's Explore....

Shared Vision

Establishing Trust

Setting Expectations

Team Development

Gift Giving

Diversity

Communicating

Effective Leadership

Shared Vision/Goal

- Key to successful leadership
- Sets the course for the team members to travel
- Improves group effectiveness
- Should be revisited regularly with the team –
 - Are we on track?
 - What has changed?



Developing a Shared Vision

Everyone can describe the “big picture”

Each team member can state his/her research goal and how it relates to the “bigger picture”

Have the group discuss each members accomplishments and challenges in achieving the goal – and how they relate to the overall mission

Instill ownership of roles and responsibility for attaining goals

Team accepts responsibility and accountability for both accomplishments and failures – without blaming.



Trust

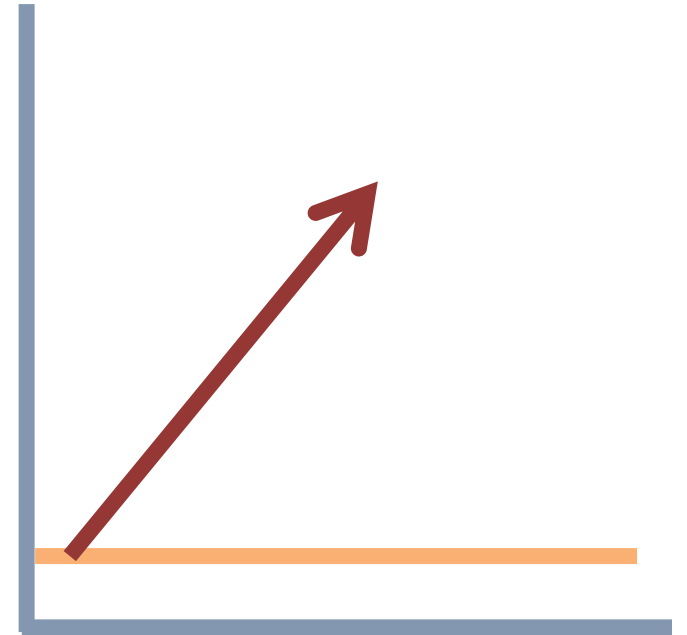
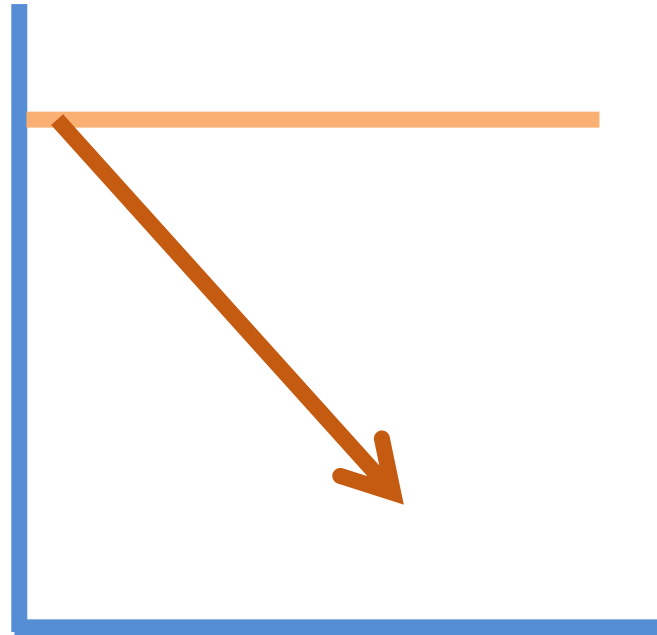
Types of Trust

Calculus based trust – built on calculations of the relative rewards for trusting or losses for not trusting

Competence based trust – built on the confidence in people's skills and abilities, allowing them to make decisions and train others

Identity based trust – built on an assumption of perceived compatibility of values, common goals, emotional/intellectual connection

Trust



Leaders Set Clear Expectations

Scaffold for deeper trust

No secrets or surprises

- Communication
- Regular Meetings with Clear Agendas
- Authorship
- Conduct of Investigation, Research...
- Technical Support
- Career Development
- Evaluation Criteria, etc....



The #1 issue that causes problems in a collaborative research effort?



Sharing:

- Credit
- Knowledge
- Resources
- Reagents
- Information
- Data
- etc....

Tools for Setting Expectations

[and creating
a scaffold for
building trust]

Collaborative Agreement

- Jointly created agreement among collaborators: can be formal or informal in its creation

“Welcome Letter”

- A scaffold for building deeper trust including: expectations and conflict

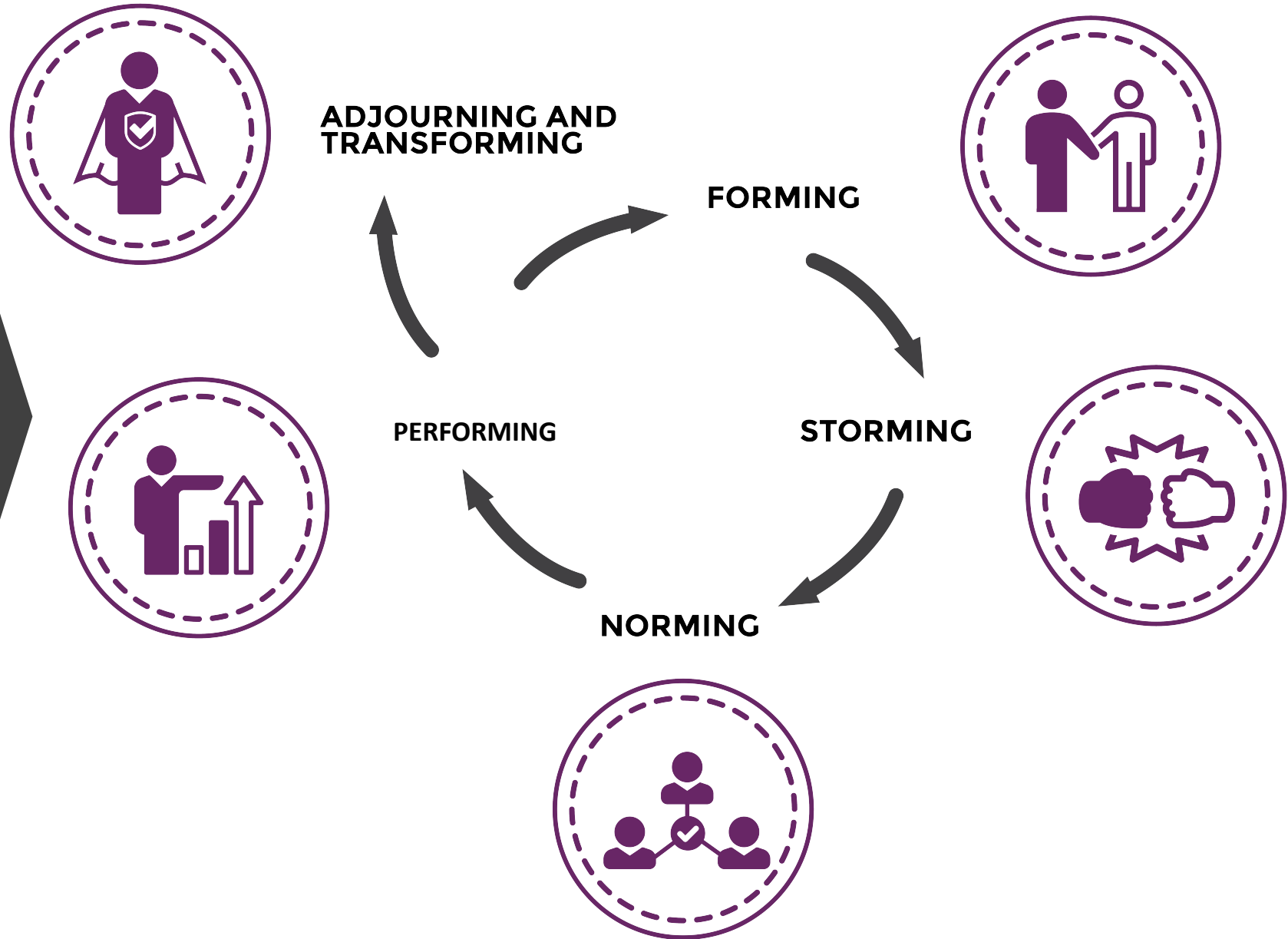
Institutional Agreements

- Language in an offer letter or pre-tenure agreement
- Joint appointment agreements

Consortium Agreements

- Biospecimen collection/use; Publications; Data storage and sharing; etc..

Model of Team Development



“The greater the proportion of experts a team had, the more likely it was to disintegrate into nonproductive conflict or stalemate.”

Collaboration
Introduces
Threats

GROUP
IDENTITY

SELF
IDENTITY



INDEPENDENT

INTERDEPENDENT

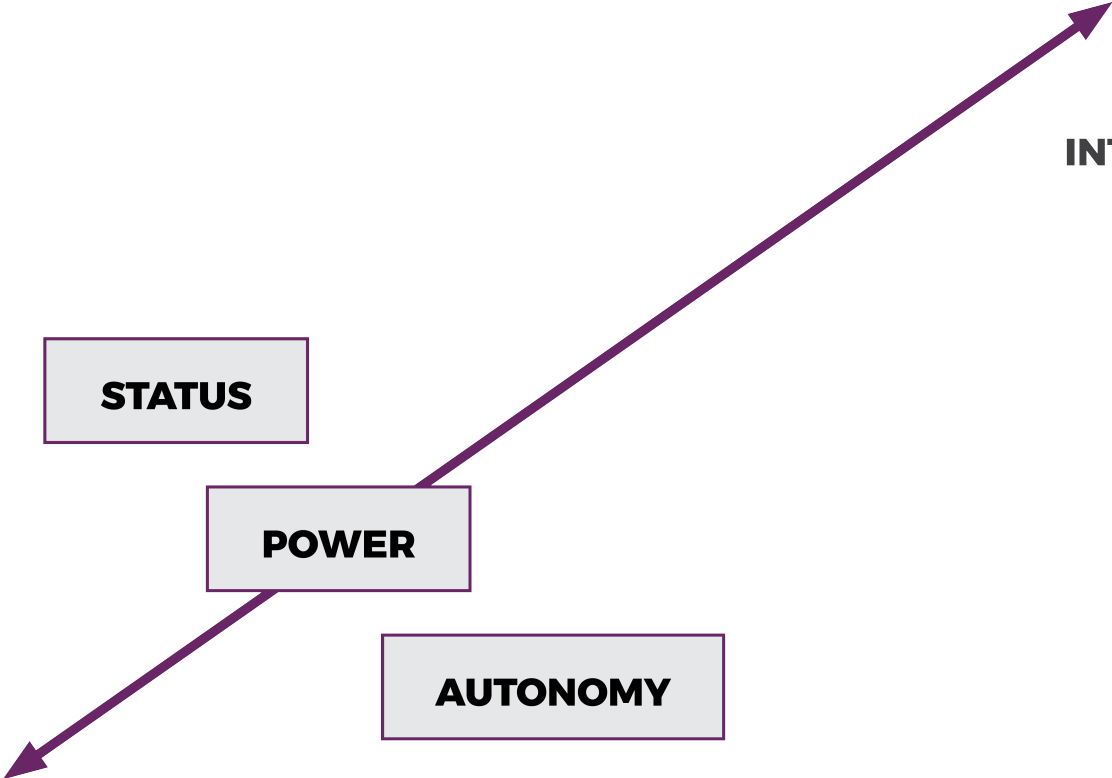
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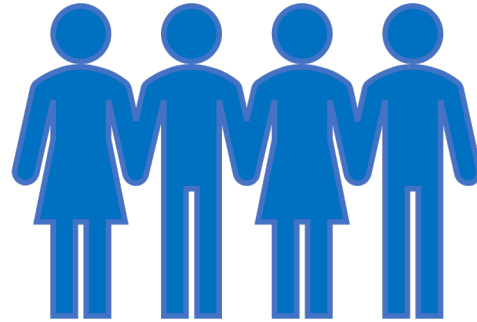
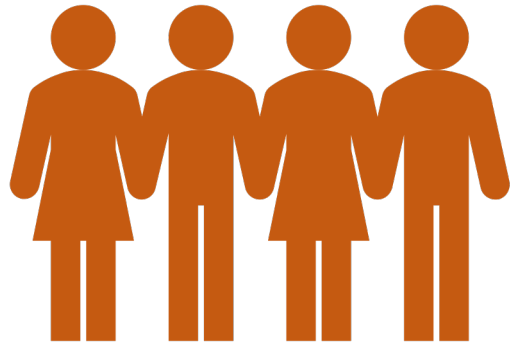
POWER

AUTONOMY

HIGH INTERACTION
AN INTEGRATION

MULTIPLE
INTERDEPENDENT
LEADERS



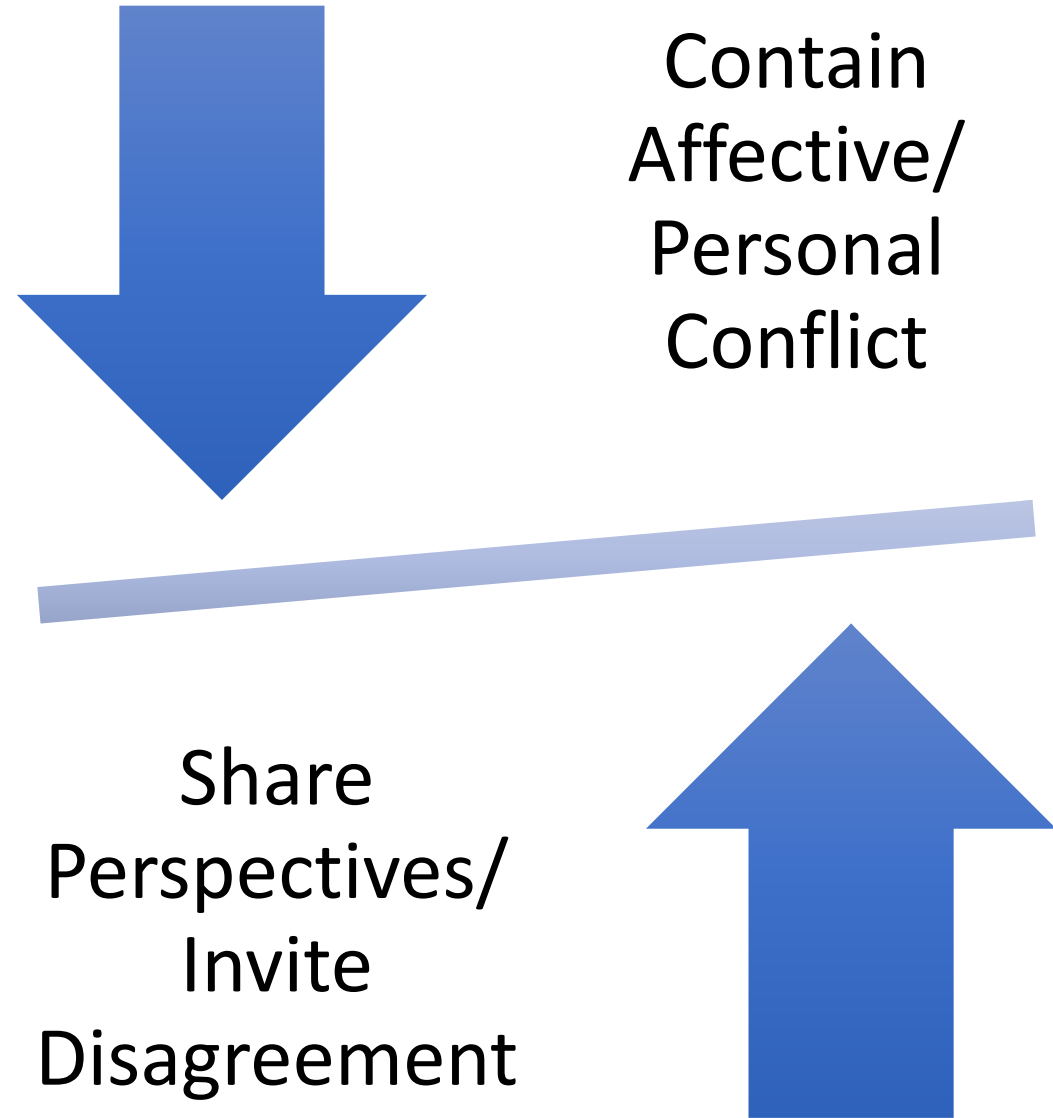


What about diversity?

Team Science is an Exercise in Diversity

- Different perspectives
- Varied experiences
- Range of expertise
- Challenging methodologies/approaches
- Questioning interpretations, results, etc...

Productive Collision



Problem Solving ...

- A diverse group is more effective at solving problems than a homogenous group
- Random selection of intelligent participants from a diverse group results in teams that can outperform a team of the “best”-performers
- Identity diverse teams are more likely to run into challenges with communication, have more conflict, and take longer to build trust

A Team
of Experts

≠

An Expert
Team



More Women: Smarter Teams

“There is little correlation between a group’s collective intelligence and the IQs of its individual members. But if a group includes more women, its collective intelligence rises.”

California Becomes First State to Mandate Female Board Directors

Law could run into legal challenges; opponents say legislation runs afoul of constitutional principles

By *Vanessa Fuhrmans*

Updated Sept. 30, 2018 6:13 p.m. ET

California became the first state to require companies based within its borders to put female directors on their boards, adding to pressure on boardrooms across the country to give more women a seat at the table.

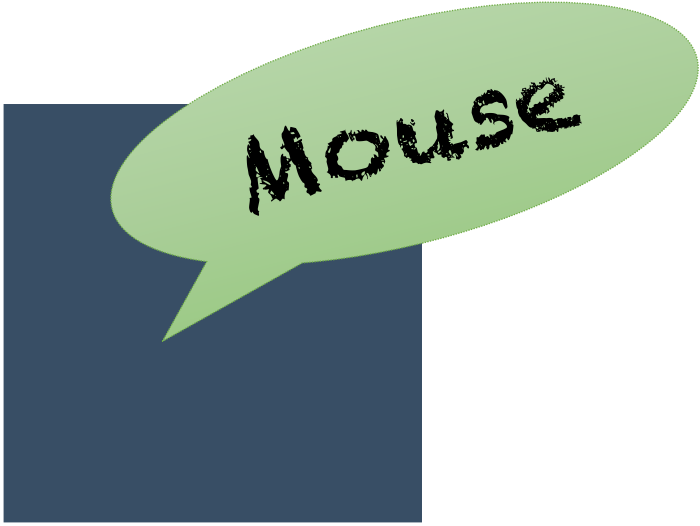
California Gov. Jerry Brown on Sunday signed a bill mandating that all publicly traded companies with headquarters in the state have at least one woman on their boards by the end of next year. By 2021, companies with at least five directors would need to have two or

Mixed Gender Scientific Teams

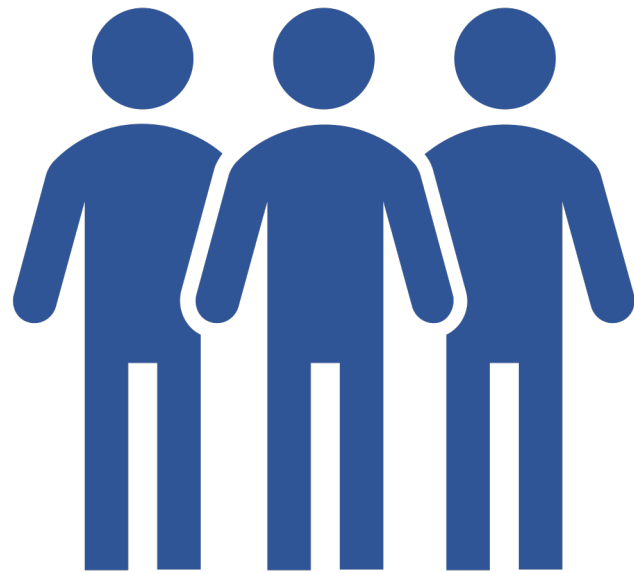
- Produced research articles considered to be of higher impact than those comprised of a single gender
 - Mixed gender teams received 34% more citations than publications produced by single gender teams
- Promoting diversity:
 - Enhances inclusion and fairness
 - May also lead to increased quality science

Diversity and a Tech Team

- Diverse perspectives are critical
- If tech teams aren't diverse, innovation is at risk
- Technology development is for everyone
- Diversifying tech teams makes stronger products as well as strategies to recruit diverse techies
- Consider HP's fiasco with regard to its facial recognition software



Communicating
Effectively
Across our
Disciplinary
Languages



You can't listen
... if people won't
speak up

- Case Study: Adopting a new technology in a clinical procedure room

Unilateral Control Approach

Values

Win, don't lose

Be right

Minimize expressions of negative feelings

Act rational

Assumptions

I understand, those who disagree, don't

I am right, those who disagree are wrong

I have pure motives, those who disagree don't

My feelings and behavior are justified

I am not contributing to the problem

Mutual Learning Approach

Values

Transparency

Curiosity

Informed Choice

Accountability

Compassion

Assumptions

I have information, so do other people

Each of us sees things others don't

People may disagree with me & have pure motives

Differences are opportunities for learning

I may be contributing to the problem

*Based on work by
Roger Schwarz and
Associates*



What do Gift
Giving and
Team Science
have in
Common?

Ideas as Gifts



- When someone shares an idea, they are sharing a gift
 - Idea = gift
- What can be done with that gift?

Possible Reactions:

- “That’s a bad idea.”
- “How are you going to do that?”
- “Sure/that’s interesting, BUT “
 - I have a better idea; it will never work; the group won’t like it; etc...
 - *However...* Is a fancy BUT
- Thank-you, AND....
 - Terrific, let me build on that idea ...



Thank-you, *and....*



- Thank-you, *and....* is at the foundation of creativity and innovation
- Requires trust
- Provides a bridge from a *not so good* idea → to a *better* idea → to a *great* one
- Helps sustain, maintain, and strengthen teams

Ideas do not require action – they do require an opportunity to be acted upon

There is no Formula for Effective Leadership

- Self- and other-awareness
- Shared responsibility for success
- Accountability for issues and problems
- Mentoring others
- Managing up and across
- Creating a safe environment
- Speaking up, challenging ideas
- Difficult conversations
- Giving your best everyday
- Serving as a role model



“The most productive, innovative teams were led by people who were both task- and relationship-oriented. What’s more, these leaders changed their style during the project.”

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Team Composition/Bios, Leadership, and Planning

a) Team Members: Ex 1

- a) My postdoc and I are the initial members. Once funded, we'll identify additional team members
- b) I've worked in teams before, so I know what to do and how to manage a team

b) Team Members: Ex 2

- a) Chemical Engineer, Environmental Engineers (2), and Materials Science Engineers (2)
- b) Each of the PIs will head a team, the teams will work toward an aspect of the shared goal. The PIs will meet once a month to talk and compare notes

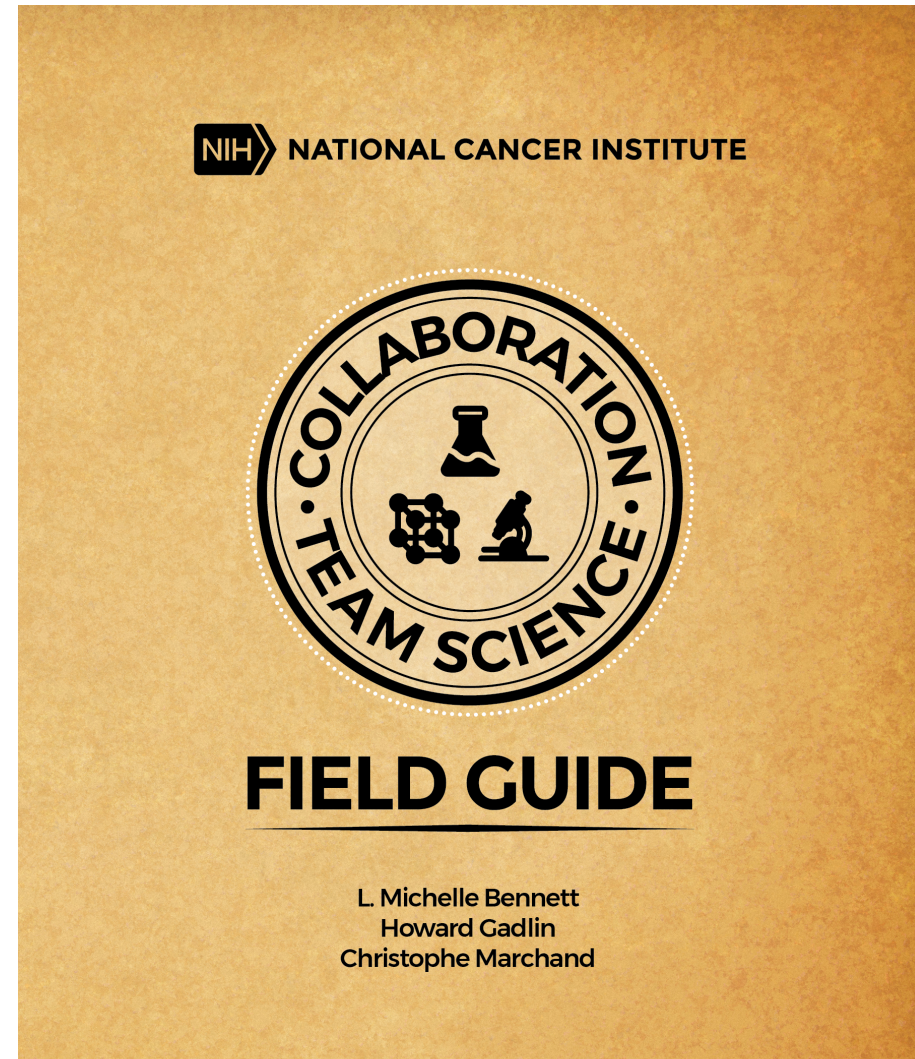
c) Team Members: Ex 3

- a) Biomedical scientist, physicist, economist, agricultural engineer, president of the Organic Farmers Association, organizational/team consultant*
- b) We worked over the last year to develop our vision for this project. Moving forward here is the plan for how we will: communicate, share data/results, resolve conflict, set expectations, bring on new team members, engage the community, ...

Sharing Credit

- Christophe Marchand
- Howard Gadlin
- Samantha Levine-Finley

- Feedback:
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