

Work Climate in Organizations Workshop

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Any opinions, findings, and conclusions or recommendations expressed in this report are those of the PI and do not necessarily reflect the views of the National Science Foundation.

EXECUTIVE SUMMARY

Many scholars want to optimize organizational innovation and effectiveness but each discipline tends to have a different approaches and metrics. Engineers tend to focus on optimizing the process (e.g., the resources, procedures and decision-making), psychologists tend to focus on optimizing the people (e.g., the team composition and motivation levels), and business scholars tend to focus on optimizing the organizational context (e.g., leadership, strategy, culture). Although scholars are becoming more aware that process-, people- and context-oriented approaches all matter to organizational effectiveness, this does not mean that they understand how these should be integrated. Moving forward requires cross-disciplinary discussions from scholars across academic silos. To contribute to this goal, a workshop was conducted in which participants could learn more about the challenges and opportunities of studying organizational innovation and effectiveness across disciplines, with specific focus on work climate. The workshop participants consisted of forty-six researchers from various colleges of business, engineering, and science both within and outside the United States. Participants discussed their own research lens of enhancing work climate (e.g., affect, teams, leadership, diversity, technology), and then a panel described the barriers and benefits for cross-disciplinary collaboration. Building on these discussions, they discussed strategies to measure and evaluate phenomena in organizations and best practices to enhance and take advantage of opportunities for collaboration, while minimizing the challenges. Finally, they discussed the latest research methods and findings of interest to all presenters, including fostering affective climate, teamwork, and creativity and innovation, and put forth ideas for future communication, collaboration, and initiatives that could be pursued in working with key sponsors such as NSF. This report summarizes the background, format, events, and findings of the workshop.

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WORKSHOP DESCRIPTION

1. Background

A key point of our workshop is that, despite attempts to design and optimize creativity and production using rational algorithms based on rigorous decision theory (Lewis, Chen, & Schmidt, 2006), people in groups make decisions and engage in behaviors that are not always rational, due to the climate in which they work. The organizational structures – the reporting hierarchy, the office layout, the product development practices, the information flow from vendors to R&D teams to manufacturing and production teams to customers and back again – certainly matter, but the climate in which people work can make the best laid plans go awry. Unfortunately, organizations are often studied through only one lens, at the detriment of complete understanding productive and innovative workplaces. For example, engineers and industrial designers use computer modeling to optimize the processes and materials for creating innovative products (Honda, Ciucci, Lewis, & Yang, 2015), but pay little attention to the experience of actual people involved. Further, engineers have studied how people use optimization and visualization tools to solve design problems and found differences based on the user's experience (Wolf, Hyland, Simpson, & Zhang, 2011), but these studies still ignore the impact of the human interactions or experience with the product being designed (Purcell & Gero, 1998). Meanwhile, psychologists and organizational behaviorists can show that collective experiences and relationships in the team affect the creative process and outcomes (Tsai, Chi, Grandey, & Fung, 2011), but tend to not pay attention to the product design constraints and information flow that affects those experiences.

Our workshop recognized the fact that working with groups of people in organizations toward common productivity and innovation goals can be a frustrating or inspiring event, and whether the collective develops a positive or negative climate can affect its functioning. Engineering scholars are becoming aware of the role of the human experience in collectives and how that can be incorporated into the rational decision models to understand why teams that seem like they should be successful are not. For example, engineers have started to identify how the team's process for designing new products and ideas affects the confidence and motivation of the employees and their team (Gerber & Carroll, 2012) and have proposed workshops and educational training programs on interdisciplinary design that includes social scientists (Simpson, Barton & Celento, 2008).

Although scholars are becoming more aware that both the people-oriented and product-oriented approaches matter to organizational effectiveness, this does not mean that they understand how these should be integrated. Moving forward in the science of organizations requires cross-disciplinary discussions from disciplines that tend to interact and publish within their own academic silos. As such, this workshop sought to foster communication between engineering design and psychology/OB disciplines, in order to advance the science of organizations through novel interactions between these disciplines.

2. Workshop Content and Format

To ignite motivation and address these issues, Dr. Alicia Grandey organized a 1.5-day workshop at Pennsylvania State University in State College, PA on May 11-13. Prominent scholars throughout the fields of psychology (industrial/organizational and social), business (management and strategy), as well as engineering (mechanical and industrial), came together to exchange ideas and best practices toward interdisciplinary communication and collaboration (a full list of conference participants can be see in Appendix A). The agenda for the workshop (Appendix B) was structured to include a range of topics and communication formats, and although there were many opportunities to exchange ideas, interdisciplinary communication and collaboration occurred in three specific ways in our workshop:

First, formal presentations from people-oriented (e.g., OB/psychology) and product-oriented (e.g., engineering) scholars provided a starting point to understand each perspective. These permitted conversations during the integrative discussions around how to develop more integrative and comprehensive models for which teams and organizations are able to be productive and innovative. Engineering scholars tend to not be trained in understanding why certain groups or contexts are likely to hinder the ability to accomplish design or manufacturing goals, and they were exposed to hearing how the work climate in today's high-pressure and diverse workplace affects the ability to produce creative ideas and outcomes. In turn, psychology and OB scholars tend to not be trained in problem framing, product develop practices, and design optimization, and they heard from the engineers about what is the expected process of designing and producing innovative products in team-based environments. Ultimately, both groups were encouraged to see how the organizational structure and design tasks affect the work climate, and how the work climate affects the productivity and innovation of design teams.

Second, through the formal presentations, each discipline learned from the other in terms of research findings and methods. The engineering scholars tend to focus on case studies, technology, computational models and algorithms where different inputs are optimized to identify the best rational design and product development process. In contrast, psychology and OB scholars tend to obtain data based on human experience and perceptions via self-reported methods, archival data, or observation, linking these experiences to team output, organizational profits, or employee retention. The engineering scholars benefitted from exposure to evidence from survey techniques and experimental design procedures while the OB scholars gained insight into computational models and experiential tasks used by many engineers and designers. These different research methods clearly come from different paradigms, but both the structural process and the subjective climate affect the motivation and innovation of organizational members.

Finally, the receptions, informal breakout sessions and coffee breaks encouraged cross-disciplinary conversations after the presentations, and permitted collaborative opportunities. Most conferences remain within our own research silos, but this workshop provided unique networking opportunities that can built novel theories and research approaches that more truly

and comprehensively capture the complexity of productive and innovative processes in today's workplace.

The attending scholars demonstrated openness to multi-disciplinary approaches for understanding organizational processes and outcomes, and were wholly receptive to this unique workshop and its goals.

3. Summary of Invited Speakers at the Workshop

A total of 17 speakers were invited to present at the workshop (see Appendix A), 12 scholars at various career stages were invited to participate, and another 17 graduate students and faculty also attended. Dr. Sigal Barsade, a psychologist from the University of Pennsylvania, gave a keynote address to begin the workshop by discussing how affect permeates organizational life, including workplace climates, performance, and culture.

Over the course of the workshop, 8 invitees met with graduate students to mentor their research in organizational life, and 14 presenters shared their perspectives on work climate (e.g., affect, leadership, teams, diversity) and work creativity/innovation outcomes. These presentations always included time afterward for the attendees from psychology, business, and engineering to discuss ways to work together to research ways to foster a productive work climate and employee creativity and innovation.

4. Summary of Workshop Events and Findings

4.1 Breaking down boundaries

An important part of our workshop was to create a climate where people from different career stages, fields and disciplines could feel comfortable with each other. This was encouraged verbally in opening comments by the PI, and through small breakout groups, but also through specific activities early on.

4.1.1. Mentoring Graduate Students. As scholars arrived for the workshop, we paired them up with graduate students who were interested in similar topics (e.g., leadership, teams, affective climate). They met in dyads for 30 minutes, and then rotated to a new pairing based again on similar interests. This breaks down the barriers between career stages and encourages all to find common ground in the research areas of interest, as well as helping the next generation of scholars receive useful feedback and development.

4.1.2 Opening Reception Ice Breaker. All the presenters and invitees – from business, psychology and engineering - met for an organizational reception that provided an overview of the workshop and agendas. In addition, they were put into groups diversified by discipline, and given a shared task to complete prior to dinner. This involved a fun activity introducing them to the Penn State campus and to each other, and then led to a larger group discussion of the challenges of working in a team with different perspectives and goals.

4.2 A Focus on Process: People & Teams

We began the first full day with opening statements from the PI, and then a keynote address from Dr. Sigal Barsade. Dr. Barsade discussed how her prior research helped to initiate the “affective revolution” in organizational science and that this research paradigm has begun to broaden our conceptualization of work influences to include new considerations for the ever-changing workplace. A vibrant discussion took place whereby Dr. Barsade solicited from the audience their perspectives of where they see the field progressing before effectively organizing them into themes based on her own insights. Later, the workshop breakout groups were organized by these themes to partition discussion in cross-disciplinary groups.

The first series of workshop presentations addressed a variety of ways that researchers can assess employees’ emotional and interpersonal skills in organizations, as an important component of work climate. Dr. Stéphane Côté (business/psych) spoke about the importance of measuring emotional competencies accurately, and presented a new behavioral approach that assess the ability to regulate reactions to events. Dr. Hillary Anger Elfenbein (business/psych) presented a new tool using reaction time to measure psychological processes implicitly to assess the ability to perceive others accurately. Third, Dr. Conrad Tucker (engineering) demonstrated his new tool that uses computer technology to perceive others’ behaviors and climate in a work team in an objective way. Finally, Dr. Sigal Barsade (business) summarized this work and her own emerging interest in exploring such competencies, and encouraged future integrative research in this area.

After a lunch break, four presenters discussed their focal topics around optimizing teamwork in organizations. Bridging the prior presentations, Dr. Andrew Knight (business) discussed the role of affective climate in teams and how it varies over time and affects the team’s ability to work together. Then, Dr. Susan Mohammed (psychology) discussed how team cognitions or shared beliefs affect their ability to work together effectively over time. Next, Dr. Tom Sy (psychology) argued for the importance of leaders and how they influence teams, and vice versa, to explain creativity and productivity. Finally, Dr. Aparna Joshi (business) addressed the growing racial and gender diversity in teams, and what that means for organizational productivity and innovation.

4.2.1 Breakout Discussion. Following the presentations, the room was divided into four sections and people were invited to group together around one general topic raised so far during these presentations. Their task was to discuss how the ideas proposed can generate testable research questions that the multi-disciplinary group can answer. This also served the purpose of getting the diverse members (students and faculty, presenters and audience, multiple disciplines) more familiar with each other’s interests and expertise. The four sections and associated topics of discussion are outlined in Appendix D.

Specifically, Group #1 considered the importance of diversity to team functioning, creativity, and innovation. Yet, group members proposed gaps in our understanding of how diversity works. For instance, group members acknowledged that a global workforce makes more common teams which are composed of members of very diverse cultural backgrounds. The group also discussed

the potential for team members to find functional support outside of their team, including leveraging individuals' social capital to enhance idea generation and implementation.

Group #2 focused on leadership and leading teams. Group members synthesized the topics of leadership and team composition to posit how leaders can assess abilities which enhance team member creative output and overall performance. They noted a balance is needed between selecting for members who will experience less conflict with one another, while also allowing for some conflict to manifest naturally to increase the quality of the final idea(s).

Group #3 drew from the presentations of team affect and cognition to engage in deeper discussions of measurement and construct validity. Specifically, group members exchanged ideas for and experiences with using new forms of technology to better measure affective and cognitive constructs at the team level. Wearable technology was a popular idea, with group members proposing the use of fitness trackers to measure physiological responses (e.g., heart rate, sleep inferences) and sociometric badges to measure vocal tone and one's proximity to others. These new technologies were integrated with ideas for how to better study team cognition, with an emphasis on understanding the physiological and emotional convergence of team members. This new line of research was thought to add substantially to what we know of team shared cognition and mental models.

Finally, Group #4 focused their discussion on psychometric issues with capturing and understanding emotions. The engineers in the group shared their experiences with using facial recognition software to gather data on emotional displays, which could be used to more objectively capture and code the displays of others. The psychologists speculated on the implications of standardizing recognition of emotional displays, and posited there exist some meaningful – and not well understood – cultural differences in perspectives of emotion. However, they recognized that the technology presents opportunities to examine these potential biases; for instance, in the way people across different cultures may recognize and read facial expressions.

4.2.2 Panel Discussion on Doing Cross-Disciplinary Work. As a closing to our first day, we had two sets of researchers sit on a panel together and informally discuss the benefits and challenges of cross-disciplinary research.

Drs. Sam Hunter (Psychology) & Scarlett Miller (Engineering) have worked together at several NSF-funded projects regarding team innovation and technology. They described their very close and trusting relationship that permits them to be honest about their assumptions and stereotypes of each others' fields, but also the challenges for their students to work well together who lack that trust at first.

Drs. Seda Yilmaz (Art & Design) & Shanna Daly (Engineering) have also worked together for several years on NSF-funded research regarding idea development and creativity in design. They described how they were seeking each others' expertise and found each other, developing a close and trusting relationship as well as a successful tool (seen in the workshop on Day 2) for others to use.

In addition, Gul Kremer (Engineering Design Professor & NSF Program Director – Division of Undergraduate Education) shared slides virtually with the workshop regarding the value of such research, from her position at NSF and engineering design.

We ended the day with a meal together and continued conversations about how the people in this workshop could strive to create such effective cross-disciplinary projects.

4.3 Focus on Outcomes: Creativity & Innovation

On the second day, Dr. Timothy Simpson (Engineering) introduced our new space – the Learning Factory – where engineers strive to produce innovation output. We then met to hear from four different presenters about their perspectives for fostering creativity and innovation in teams. They each provided their own view of what was creativity and innovation, and then how they tend to study it. First, Dr. Katherine Jablow (engineering design) discussed the importance of the traits and abilities of the team members, and how to assess and develop those to foster team creativity. Second, Dr. Scarlett Miller (engineering) described how engineers teach and foster innovation through techniques such as product dissection, design by analogy with nature, and technology that permits virtual creation and to assess good fitting team members. Third, Dr. Sam Hunter (Psychology) discussed his own research lab focusing on leadership and a climate for innovation, and the challenge of leaders providing enough guidance but not constraining creative and novel thought. Finally, Dr. Rikki Nouri (Business) discussed how the concept of creativity varies by culture, and cultural diversity affects the ability of the team to take risks and be creative thus requiring the right combination of culture and task to be effective.

4.3.1 Breakout Discussion. After these presentations, we asked the audience to get into teams and try to draw an image that integratively and comprehensively represented these four different perspectives of creativity in teams. These breakout groups had engaging discussions about what factors were most important to creativity and developed four very distinct images that, while different, all showed a multilevel (person, team, leader/climate, national culture) and multi-disciplinary approach to creativity. In other words, it was clear these four different perspectives could fit together in interesting new ways.

4.3.2 Experiential Workshop. As our closing event, Drs. Seda Yilmaz (Industrial Design) & Shanna Daly (Engineering) presented their own perspective of creativity and innovation, including a new tool they developed based on case studies and analysis of many creative people and processes. They then modeled the tool for the participants. They first had small groups work together to identify and sketch new designs for salt and pepper shakers. Then were introduced to their tools, 77 cards with ideas developed by the researchers. Groups then used the cards in various ways to foster new designs for salt & pepper shakers, enabling more ideas and more diverse ideas from the members. Participants were all given their own packet of these cards to take home for their own use in the classroom or their research labs.

5. Research Conclusions

5.1 Research Implications and Recommendations for Future Research

Throughout the process of this workshop, participants learned more about different perspectives of organizational science, and were able to talk to and connect with these scholars in ways previously not possible. It became clear that the goals we seek – to foster effective work climates, teams, and leaders in order to produce innovative outcomes – were similar, even if our approaches or techniques were different.

Participants were also given insights into how to engage in such cross-disciplinary work by presenters currently doing it, and how to avoid the challenges that they may face. This permits our workshop attendees to enter into new research relationships based on their exposure to these other scholars an awareness of their interests and methods, but also with awareness of what is necessary for that relationship to be effective.

Graduate students were present and engaged in the breakout groups throughout the workshop, as were junior faculty members. Thus, this workshop laid a foundation for those who are still at the early stages of their own research to encourage cross-disciplinary work of the highest caliber.

Some of the ideas for future research can be seen in Appendix D from the first day's breakout groups. Additional ideas from Day 2 included integrating and assessing multiple levels to more fully understand innovation in organizations: personal abilities and traits, team composition, leadership and climate, and culture all are embedded together, though people tend to study one component separate of the others.

5.2 Comments from Participants. Over the next few days, the PI received many unsolicited comments from the participants. These help to illustrate the implications and future that was enabled by this workshop.

From graduate and faculty attendees

- Thank you for putting this conference together and inviting me. It was exceptional! All of the talks were interesting, and meeting these scholars was really helpful for me to imagine life as an academic. BEST conference/talks I have seen so far.
- I just wanted to tell you that this conference was really good!! Thank you so much for putting this together and giving us the opportunity to meet all the scholars we read about the entire semester. It was also really great to get a feel of the inter-disciplinary work that is currently being done and possible projects that could be started. I am really happy that I had the opportunity to attend it!
- Thanks for setting up the conference! It was a great way to learn more about various emotion related topics and meet some of the big names in the field. The one-on-one mentoring was a great way to get some feedback as well!
- Thanks again for putting the conference together - it was a lot of fun, and very worthwhile!
- Also, congrats on a fantastic workshop! It allowed for great exposure outside of my research interests and the opportunity to meet a lot of interesting researchers.

From the Workshop participants/speakers

- At the risk of bogging everyone down in a collective e-mail, I wanted to give an overarching THANK YOU!!!! for organizing such a terrific conference. It was generative, interesting, useful, and offered an opportunity to hang out with some of the most interesting folks in the field! Your care, attention to detail, and planning were very evident. Thank you very, very much!
- Wow, what an amazing conference! Thanks for throwing it! Looking forward to the next time!
- Thanks again for an Amazing Event! My brain was totally full by the time I drove home on Friday evening – and that’s a GOOD thing!
- Looking forward to new collaborations, more photos, and getting to know PSU’s I/O Psych group even more.
- Thank you very much for hosting such a successful NSF Workshop! I really enjoyed meeting researchers from other disciplines. I look forward to keeping the momentum going with those that I met at the workshop or those that may be interested in collaborating.
- Thanks again for the invitation and for organizing a great meeting. It was a great learning experience, and it’s always great to see you.
- Thank you very much for inviting us and allowing us being part of the amazing workshop you hosted! We both truly enjoyed the presentations and discussions with the folks from psychology. We also had great conversations with the engineering team there. We are looking forward to turning some of these discussions and conversations into real collaborations!

Appendix A. Workshop Speakers and Participants

Name	Department	Institutional Affiliation
Hillary Anger Elfenbein	Business	Washington University of St. Louis
Sigal Barsade	Business	University of Pennsylvania
Daniel Beal	Business	Virginia Tech University
Lily Cushenbery	Business	Stony Brook University
Meng Chen	Business	Pennsylvania State University
Stéphane Côté	Business	University of Toronto
Jason Dahling	Psychology	The College of New Jersey
Shanna Daly	Engineering	University of Michigan
James Diefendorff	Psychology	University of Akron
Lance Ferris	Business	Pennsylvania State University
Allison Gabriel	Business	University of Arizona
Karen Gasper	Psychology	Pennsylvania State University
Jenna Gilchrist	Kinesiology	University of Toronto
Theresa Glomb	Business	University of Minnesota
Alicia Grandey	Psychology	Pennsylvania State University
Elizabeth Grimaldi	Psychology	Pennsylvania State University
Markus Groth	Business	University of New South Wales
Melissa Gutworth	Psychology	Pennsylvania State University
Stan Gully	Labor Relations	Pennsylvania State University
Daniel Henderson	Engineering	Pennsylvania State University

Appendix A (cont'd.)

Name	Department	Institutional Affiliation
Ivona Hideg	Business	Wilfrid Laurier University
Samuel Hunter	Psychology	Pennsylvania State University
Kathryn Jablokow	Engineering	Pennsylvania State University
Kisha Jones	Psychology	Pennsylvania State University
Aparna Joshi	Business	Pennsylvania State University
Andrew Knight	Business	Washington University of St. Louis
Jeffrey Lovelace	Psychology	Pennsylvania State University
Kaitlin McCormick	Psychology	Pennsylvania State University
Alex McKay	Psychology	Pennsylvania State University
Robert Melloy	Psychology	Pennsylvania State University
Scarlett Miller	Engineering	Pennsylvania State University
Susan Mohammed	Psychology	Pennsylvania State University
Brett Neely	Psychology	Pennsylvania State University
David Nembhard	Engineering	Pennsylvania State University
Rikki Nouri	Psychology	Technion Israeli Institute of Technology
Matt Parkinson	Engineering	Pennsylvania State University
S. Douglas Pugh	Business	Virginia Commonwealth University
Gordon Sayre	Psychology	Pennsylvania State University
Brent Scott	Business	Michigan State University
Stephanie Shields	Psychology	Pennsylvania State University

Appendix A (cont'd.)

Name	Department	Institutional Affiliation
Tim Simpson	Engineering	Pennsylvania State University
Elizabeth Starkey	Engineering	Pennsylvania State University
John Trougakos	Business	University of Toronto-Scarborough
Conrad Tucker	Engineering	Pennsylvania State University
Thomas Sy	Psychology	University of California-Riverside
Seda Yilmaz	Engineering	Iowa State University

Appendix B. Workshop Agenda

Time	Event
Thursday May 12th	FOCUS ON PROCESS: PEOPLE & TEAMS Location: 127 Moore Building (Psych) – walk past parking deck
9:00-9:30	Breakfast ; Welcome & Introduction (Grandey)
9:30-10:45	Keynote Speaker (Sigal Barsade) Work Climate and Culture: The Role of Affect in Organizations
10:45-11	Coffee break
11-12:15 <i>“What are the problems, and how can we better assess emotional & interpersonal abilities/skills in organizations?”</i>	Panel Discussion: Assessing Emotional Abilities Sigal Barsade (computerized EP measure; new measure development) Stéphane Côté (behavioral ER measure) Hillary Anger Elfenbein (implicit EP measure) Conrad Tucker (computerized detection of team emotion/behavior)
12:15-1:15pm	Lunch Break; Creamery for ice cream (optional)
1:15-2:30 <i>“What are key factors that optimize the way teams will work together in organizations?”</i>	Multi-Disciplinary Perspectives: Optimizing Team Dynamics in Orgs Andrew Knight (team affect) Tom Sy (leadership & emotions) Susan Mohammed (team cognition) Aparna Joshi (team diversity)
2:30-3	Coffee Break with Breakout Group Discussions
3:00-4:00 <i>“How can multidisciplinary research teams work well together?”</i>	PANEL: Benefits and Challenges of Cross-disciplinary work in psych and engineering Sam Hunter & Scarlett Miller Seda Yilmaz & Shanna Daly Gul Kremer (Engineering Design Professor & NSF Program Director – Division of Undergraduate Education)
4:00-5:00	Breakout Groups – Report Back
5:00-6:00pm	Break/free time
6:00pm-8pm	Gather at NLI Lobby at 6 to Walk to dinner: Allen Street Grill (6:30)

Appendix B (cont'd.)

<i>Friday May 13th</i>	FOCUS ON OUTCOMES: CREATIVITY & INNOVATION Location: Learning Factory in ENGR (http://www.lf.psu.edu/)
8:30 (leaving at 8:45!)	Meet in NLI Lobby to walk over to the ENGR building
9:00-9:30	Breakfast & Introduction to Day 2 (Grandey)
9:30-10:45 <i>“What are ways to foster creativity and innovation in organizational teams?”</i>	Multi-Disciplinary Perspectives: Fostering Innovation & Creativity Scarlett Miller (engineering innovation) Katherine Jablokow (engineering design) Sam Hunter (climate for innovation & leadership) Rikki Nouri (cultural diversity and creativity)
10:45-11:15	Coffee break & Group Discussion
11:15-12:15 <i>“What are tools to improve creativity developed by cross-disciplinary scholars?”</i>	Experiential Workshop: Innovation & Creativity in Teams (led by Seda Yilmaz & Shanna Daly)
12:15-1:30 pm	Closing comments & Boxed Lunch to go

Appendix C. References

- Boatwright, P. B. H. & J. Cagan (2010). *Built to Love - Creating Products That Captivate Customers*. San Francisco: Berrett-Koehler Publishers, 2010.
- Gerber, E., & Carroll, M. (2012). The psychological experience of prototyping. *Design Studies*, 33, 64-84.
- Honda, T., Ciucci, F., Lewis, K. E., & Yang, M. C. (2015). A comparison of information passing strategies in system level modeling. *AIAA Journal*, 53, 1121-1133.
- Lewis, K., Chen, W., & Schmidt, L., Eds. (2006). *Decision Making in Engineering Design*, ASME, New York.
- Purcell, A. T. & Gero, J. S. (1998). Design and other types of fixation. *Design Studies*, 17, 363-383.
- Simpson, T., Barton, R., & Celento, D. (2008). Interdisciplinary by design. *Mechanical Engineering*, 130, 30-33.
- Tsai, W. C., Chi, N. W., Grandey, A. A., & Fung, S. C. (2012). Positive group affective tone and team creativity: Negative group affective tone and team trust as boundary conditions. *Journal of Organizational Behavior*, 33, 638-656. h
- Wolf, D., Hyland, J., Simpson, T. W. and Zhang, X. (2011), The importance of training for trade space exploration: A study of novice and expert users," *ASME Journal of Computing and Information Science in Engineering*, 11, 031009-1 - 031009-11.

Appendix D. Workshop Breakout Session Group Themes

Group 1: Diversity in Team Membership and Organizational Composition

- Topics of Discussion
 - Diversity in team membership (e.g., different stages in career)
 - Team member cultural differences (e.g., Indian, American, Israeli cultures)
 - Empowerment through relationships outside of teams
 - Pros and Cons to team member support outside of teamwork
 - Intersection of team member gender and cultural background

Group 2: Leading for Creativity and Innovation in Teams

- Topics of Discussion
 - Best practices in forming successful teams
 - Leading to foster team member creativity
 - Minimizing team conflict at the outset of team formation

Group 3: Affect & Cognition in the Workplace

- Topics of Discussion
 - Wearable technology to measure team constructs (e.g., sociometric badges)
 - Convergence of team cognition and their shared mental models: When and why?
 - Convergence of team member emotions and feeling states

Group 4: Emotional Competence and Measurement/Methodology

- Topics of Discussion
 - Cross-cultural perspectives of emotions
 - Individual differences in facial recognition
 - How do you create one test for everyone?
 - Quantitative metrics to assess emotions and generalize findings across cultures