The Nature of Conflict for Teams in Isolated, Confined, and Extreme Environments

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Introduction

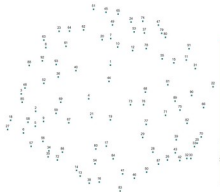
Effective conflict management is critical for future space exploration where successful teamwork is paramount for both safety and achieving mission objectives. While conflict has been identified as a key issue for teams in isolated, confined, and extreme (ICE) environments, less is known about the nature of conflict in this context. Given the unique challenges these teams face, lessons learned about conflict in more traditional organizational teams may no longer apply. The purpose of this research is to characterize the nature of conflict for teams in ICE environments. As such, this research contributes to both theory and practice by refining our understanding of conflict and providing a foundation upon which conflict management interventions can be built that most effectively target the unique needs of these teams.

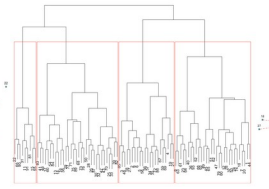
Method

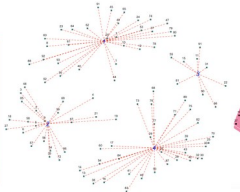
Data Collection. Data were collected from 5, 4-person teams (*n*=20) isolated in NASA's Human Exploration Research Analog (HERA) for up to 45 days.

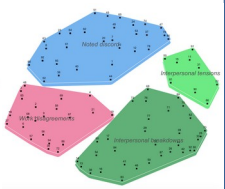
Conflict Measure. In an end-of-day conflict survey, crew members were asked (1) if they are currently in conflict with any crew member, and (2) if they had experienced conflict with any crew member in the past 24 hours, and were asked to describe the conflict. This resulted in 88 initial open-ended reports of conflict that were analyzed using Jackson & Trochim's (2002) concept mapping method.

Classification of Conflict. Coders split conflict reports into 93 single conflict episodes that were open card-sorted by 10 research assistants. Card sort results were analyzed with multidimensional scaling and cluster analyses using an open-source software for concept mapping (R-CMap; Bar & Mentch, 2017).


Multidimensional scaling point map of statements


Dendrogram of merging conflict episodes highlighting final cluster solution


Four-factor solution applied to MDS map


Final cluster solution with conflict labels

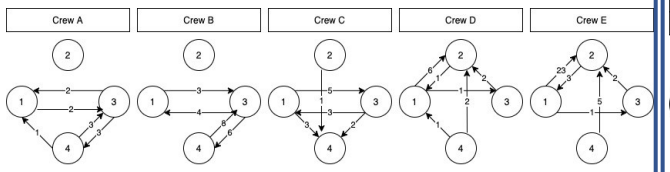
Four clusters representing conflict types emerged from the concept mapping analysis

Cluster Name	Characterized by…	Representative Statements
Noted discords	• External attributions, equal accountability • Resolved or towards resolution	"Fatigue is causing [position] and me to get annoyed with each other. I think we both recognize that most of the issue is fatigue."
Work disagreements	• Disagreements over mission tasks and procedures • Different perspectives over work	"We had a disagreement about how to do our EVA."
Interpersonal tensions	• Tense relationships, internal attributions and blaming • Personality spats and frustration	"Difficult to say at this point if we are in conflict or not. I feel like I get the cold shoulder or ignored, but maybe [s/he] isn't a communicative person..."
Interpersonal breakdowns	• Intense aggravation • High emotion, relationship toxicity	"[S/he] is toxic and corrosive to team cohesion with empty psychological resistance, complaining, negativity, bad attitude. Selection filters clearly were slipped through."

Conflicts were examined by question prompt they were reported in response to. Noted discords and work disagreements were more commonly reported to conflict 'in the past 24 hours', while interpersonal tensions and breakdowns were more commonly reported as 'current' conflict.

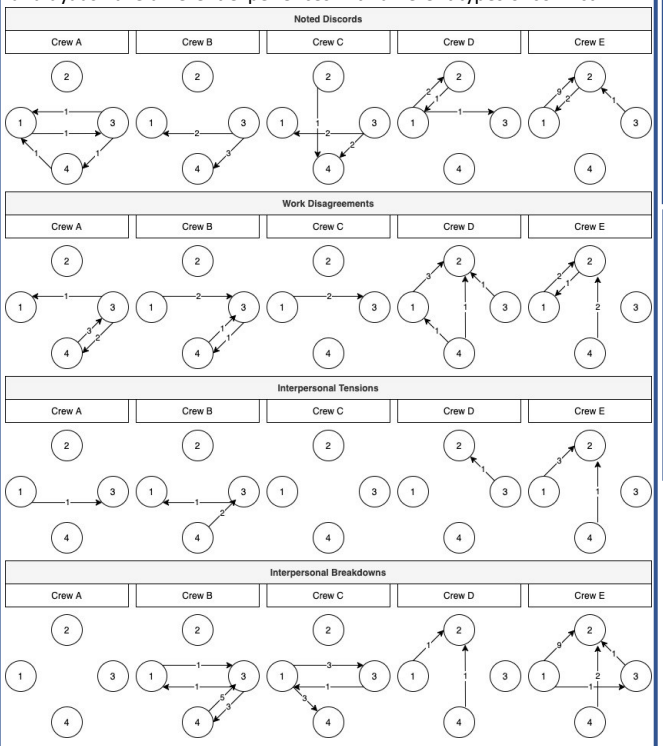
Cluster	Currently in Conflict	Conflict Past 24hrs	Total
Noted discords	9	21	30
Work disagreements	3	19	22
Interpersonal tensions	6	3	9
Interpersonal breakdowns	20	12	32

Some crews reported more than double the conflicts of other crews, some crew members reported more conflicts than others, and some crew members were reported as involved in conflicts more often than others.



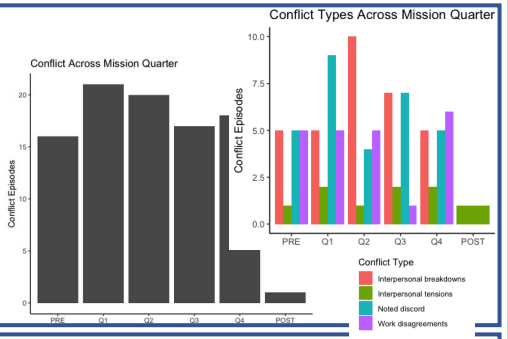
Results

Breakout of reported conflicts by conflict type and crew show that crews and dyads have different experiences with different types of conflict.

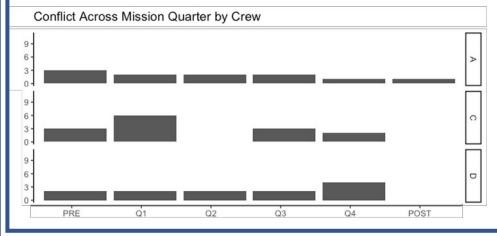


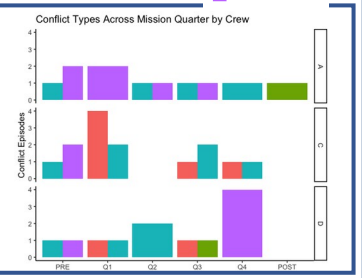
While overall number of conflicts reported across mission was relatively stable, there are differences by conflict type:

- Noted discords peaked as soon as crews entered isolation
- Interpersonal tensions and work disagreements were steadily reported throughout mission
- Interpersonal breakdowns were reported across mission with a peak mid-mission



Each crew has a unique signature of conflict reports





Discussion & Conclusions

- The breakdown of conflict that results from this work is different from the way that conflict is most typically conceptualized, **suggesting teams in ICE settings may require a more nuanced understanding of conflict than traditional typologies have provided.**
- Crews have unique patterns of conflict in terms of amount, type, and timing; examination of these patterns can inform how relationships evolve.
- Insights from this work will help inform the effective development and deployment of conflict management countermeasures to ensure LDSE teams are equipped with the tools needed to handle conflicts that arise, break destructive conflict cycles, and ultimately succeed.

For full paper: Marcinkowski, M. A., Bell, S. T., & Roma, P. G. (2021). The nature of conflict for teams in isolated, confined, and extreme environments. *Acta Astronautica*, *181*, 81-91.