The International Journal of Interdisciplinary Global Studies
ISSN: 2324-755X (Print), ISSN: 2324-7568 (Online)
Volume 18, Issue 2, 2023
https://doi.org/10.18848/2324-755X/CGP/v18i02/57-76

To What Extent Do Affective Events Influence the Performance of Global Virtual Teams?

Arkadiusz Mironko, Indiana University East, USA
Jaynne Rivas, Indiana University East, USA

Received: 10/15/2022; ***Accepted***: 04/28/2023; ***Published***: 06/27/2023

Abstract: *The effect of emotions on team performance is traditionally related to personal interactions. This study aims to advance the theory in global virtual teams (GVTs) by exploring how emotions evolve over time and impact team performance. This study evaluates GVTs working on a business through large data sets capturing interactions and performance steps. We investigate the impact of affective events on the performance of GVTs. The data was collected, and the initial draft of the study was performed before the COVID-19 pandemic ensued. The findings demonstrate that the level of emotions varies over time according to work-related stimuli, such as workload and deadlines, while the high level of emotion displayed—both positive and negative—also influences GVTs and is correlated with teams' performance.*

Keywords: *Global Virtual Teams, Emotions, Strategic Decision Making, Affective Events Theory, Team Performance, Necessary Condition Analysis*

Introduction

How do affective events influence the performance of global virtual teams (GVTs)? Emotions are social in nature, which makes it difficult to relate to them when working virtually. In a traditional work setting, social relationships vary over time (Barsade and Knight 2015) according to the tasks being performed (Eddy, Tannenbaum, and Mathieu 2013; Marlow, Lacerenza, and Salas 2017; Villado and Arthur 2013) and the stage of a group's development (Gersick 1989). In addition, research shows that emotions are an important stimulus in a group environment, as they define or shape the affective experience of the group and can influence group cohesion, commitment, and performance (Kelly and Barsade 2001; Emich et al. 2020).

The importance of studying emotions in virtual teams (VTs) derives from the popularity of VTs and the recognized potential they have to increase productivity in organizations (Martins, Gilson, and Maynard 2004). This benefit depends, however, on an organization's ability to manage VTs (Aubert and Kelsey 2003). Consequently, emotions are one of the most critical factors that VTs face (Zaccaro and Bader 2003), and managing emotions is key if organizations want to realize VTs' potential (Ayoko, Konrad, and Boyle 2012). In this regard, Martins, Gilson, and Maynard (2004) have identified a need for more studies on affective responses in VTs, while Fineman, Maitlis, and Panteli (2007) have recommended more research on how emotions influence behavior and performance in VTs.

Time is a fundamental factor in understanding the impact of emotions on VTs. Literature on the traditional group setting demonstrates the importance of taking a

temporal perspective when studying team processes (Arrow et al. 2004). Similarly, literature on VTs suggests studying the development of emotional behavior in VTs over time (Barsade and Knight 2015; Gersick 1989, 1989; McGrath 1991).

The inherent diversity of today's global environment is another fundamental factor in understanding the impact of emotions on VTs. As such, potential performance limitations of VTs can be amplified in GVTs, in which communication is affected by language and cultural differences (Jarvenpaa and Leidner 1999). Communication enables coordination and facilitates the flow of information, which leads to openness and satisfying relationships (Gladstein 1984). Subsequently, an awareness and understanding of diversity builds trust in VTs, which is a fundamental factor for good communication and positive team outcomes (Gibson and Manuel 2003). Diverse GVTs have the potential to generate ideas, although earlier findings on diversity also find diversity in teams as a double-edged sword (Van Knippenberg and Schippers 2007).

The main objective of this study is to advance theory on how emotions affect GVTs over time and impact team members' performance (Barsade and Knight 2015). This topic has been studied in the past utilizing qualitative data (Ayoko, Konrad, and Boyle 2012), with the inevitable consequences of the lack of reliability. In addition, most field studies on this subject were conducted using student teams working on short-term tasks (Gilson, Maynard, and Bergiel 2013; Martins, Gilson, and Maynard 2004). In contrast, this study has used quantitative data to explore patterns of emotional behavior and evaluate student GVTs working on business projects through large data that represents multiple interactions and performance stages. Considering these limitations, we expect to shed light on how GVT members' emotional levels vary over time in response to work-related stimuli. We also expect to demonstrate that a GVT's performance is strongly related to the level of its members' emotions. Based on the findings, we will create a set of recommendations to help manage emotions in GVTs to improve their performance.

Literature Review

Virtual Teams

Some key characteristics of VTs have been identified in the research. First, GVT members use technology. Specifically, they communicate electronically across space and time boundaries to perform a job (Hambley, O'Neill, and Kline 2007). Second, GVTs are culturally diverse, including members from different countries of birth and involving multiple primary languages and cultures (Bhat, Pande, and Ahuja 2017). Third, GVTs are temporary in nature, designed to accomplish specific tasks using global talent instead of being limited to that which is local (Bhat, Pande, and Ahuja 2017). Finally, GVTs are often dispersed geographically and among multiple industries (Bhat, Pande, and Ahuja 2017), meaning that a single team could have members in multiple locations and professional fields.

There are multiple advantages to utilizing GVTs. They represent a low-cost strategy for compiling individual expertise from around the world in a relatively short time and with a high potential for efficiency (Aubert and Kelsey 2003). Furthermore, the multicultural composition of VTs helps to generate ideas, and the electronic communication allows for the best talent for a task to be found, while at the same time reducing the cost of transportation for people from remote locations (Bhat, Pande, and Ahuja 2017).

While the benefits are clear, GVTs also face challenges that can prevent them from fully realizing their potential (Aubert and Kelsey 2003). For example, some authors suggest that conflict may be more frequent in GVTs because of a greater possibility of misunderstanding (Axtell, Fleck, and Turner 2004), which negatively affects VT performance (Mortensen and Hinds 2001). Moreover, Ayoko, Konrad, and Boyle (2012) found that managing emotions is fundamental for achieving the potential of a VT, and Hassett et al. (2018) found that managing emotions plays an important role in the success of GVT interactions. Additionally, some studies recognize that working in the face-to-face environment allows for easier ways to mitigate affective events in teams (Weiss and Cropanzano 1996; Cohen et al. 2011).

Thomas and Peterson (2018) explore how cultural differences can both stimulate team creativity and create multiple relational and communication problems that significantly limit teamwork. The authors highlight the importance of understanding cultural differences to foster a more effective team dynamic. The article emphasizes that cultural differences can bring a diversity of perspectives and ideas, which can enhance the creativity and innovation of teams. However, these same differences can also create misunderstandings and conflicts, particularly in communication styles, leading to decreased productivity and performance.

Thomas and Peterson (2018) provide examples of how culture affects communication, such as the use of direct versus indirect language, the importance of hierarchy, and the degree of formality in addressing others. They also discuss the impact of culture on teamwork, including differing attitudes toward individual versus group work, approaches to problem-solving, and expectations for leadership.

Emotions and Affective Events

The affective events theory (AET) proposes that different factors in the work environment trigger emotional reactions (Weiss and Cropanzano 1996). Following this theory, affective events have been defined as any display of emotion (joy, excitement, sadness, anger, etc.) that appears in response to team interactions and has the potential to affect work outcomes. Similarly, emotions have been defined as subjective feeling states that have a clear cause or object, are intense, and are short in duration (Ayoko, Konrad, and Boyle 2012).

The idea that emotions are socially developed is not new in the literature. Early research has shown that individuals' emotions synchronize when people are in groups (Hatfield, Cacioppo, and Rapson 1994). The reciprocity of emotions and how individuals express emotions as a response to significant social events (McGrath 1991; Van Kleef, De Dreu, and

Manstead 2004) has also been studied. With regard to virtual interactions, Ayoko, Konrad, and Boyle (2012) recently found that emotional reactions are often communicated using text messages and emails.

The literature mentions several factors that can foster negative emotions in VTs. For example, Gibson and Manuel (2003) have suggested that virtual communication makes it difficult to identify positive emotions like warmth, attentiveness, and trust. A study based on simulation data shows that added time pressure, hence approaching a deadline or a decision, results in team members experiencing anger (Emich and Vincent 2020; Van Kleef, De Dreu, and Manstead 2004). Furthermore, communication delays, time zone differences, and language barriers (Mannix, Griffith, and Neale 2002; Riopelle et al. 2003) may affect VTs by regulating emotions. Mironko, Muriungi, and Scardino (2022) highlight the importance of understanding and accommodating cultural differences in the virtual workplace. They note that cultural differences can affect communication styles, conflict resolution, decision-making processes, and leadership styles, all of which can impact teamwork. These factors can increase the perception of differences, thereby increasing negative emotions (De Dreu and Weingart 2003; Emich and Vincent 2020).

On the other hand, the study by Erez et al. (2013) shows that more heterogeneous teams may experience more positive emotions due to global norms influencing their emotions. The mixed results from their research show that whether the experienced emotions are positive or negative matters less than the ability to focus on the task faced by the team (Taylor 1991; Jordan and Troth 2002).

The effect of emotions on team outcomes has been established by Barsade and Gibson (2007). They determined that emotions, both positive and negative, have an impact on strategic decision-making in organizations, whereas Van Kleef, De Dreu, and Manstead (2004) show that anger has a positive effect on negotiation outcomes. Similarly, the impact of affective events, elicited by conflict on performance, varies (De Dreu and Weingart 2003; Nair 2008). A positive impact will occur during a cognitive conflict, disagreement about content and processes, while a negative impact will occur during an affective conflict, or disagreement based on personal and social issues (De Dreu and Weingart 2003; Emich and Vincent 2020).

The effect of positive emotions has also been studied in literature that explores face-to-face teams. According to Barsade (2002), positive emotions can be contagious among group members and improve team cooperation. In addition, positive emotions can foster open discussion and, as a result, constructive conflict management (Hobman, Bordia, and Gallois 2003). On the other hand, agreeable teams working together tend to support the initial ideas (Beersma et al. 2003; Bradley et al. 2013) without challenging their validity in order to maintain a positive team environment (Beersma et al. 2003; Neuman and Wright 1999). Therefore, the relative anonymity of VTs allows them to more readily challenge the ideas presented (Martins, Gilson, and Maynard 2004; Townsend, DeMarie, and Hendrickson 2000).

Emotions and Team Tasks

Literature on VTs shows that emotions can be deeper and arise more often depending on the task a team is performing or the process they are experiencing (McGrath 1991). For instance, the resulting emotional reactions from conflict happen more often if a team has been assigned a task that demands contribution from everyone than if the task is one that can be completed individually (Zettinig, Mockaitis, and Zander 2016). Similarly, teams are often involved in interpersonal process tasks that elicit emotions, like that of managing members' conflict, motivation, and affect levels (Marks, Mathieu, and Zaccaro 2001). Further, Elfenbein (2014) links affective process theory to divergent and convergent, conversely different, and similar points, to further collaboration. According to Fisher (2014), team members must resolve interpersonal processes of emotion to successfully reach a goal. As such, one could imagine that emotions further affect group outcomes indirectly through their influence on the participating individual's well-being (Barak, Boniel-Nissim, and Suler 2008). According to emotional labor theory, suppressing one's own emotional display in a work environment leads to exhaustion and lower job satisfaction (Morris and Feldman 1996; Lee and Ok 2012). On the one hand, this underpins our argument that emotional display should be beneficial (Becker et al. 2018) while, at the same time, suppressed emotions are very powerful (Rafaeli and Sutton 1987; Diefendorff and Richard 2003).

The research by Degbey and Einola (2020) connects self-reflection in teams to teams' resilience. They look at team members' self-reflection in-action and self-reflection for-action as regulating elements of emotional expression in VTs and their resilience levels. Likewise, DeRue et al. (2012) have suggested that "self-generated and process-oriented feedback" (p. 5) can help groups to deal with emotions that might otherwise negatively affect learning (DeRue et al. 2012). Finally, Eddy, Tannenbaum, and Mathieu (2013) have suggested that dealing with emotions in advance contributes to team members' involvement. Here, we explore further the degree to which the affective events impact the performance of GVTs.

The Model

Figure 1 shows the dynamic model of emotions in GVTs. This model refers to teamwork in projects that have several partial deadlines before the final one. Throughout the project, teams communicate mostly in an asynchronous way. Based on the AET, we suggest that each project's deadline imposes a time urgency, which is one of the factors in the GVT environment that can elicit a "peak" of emotions (Barsade and Knight 2015). Completing the task in each deadline arouses emotions, as a result of either the restriction in communication (e.g., asynchronous) or the differences in geographic origin (e.g., time-zones or language). The time urgency related to each project deadline is represented by "time 1," "time 2," "time 3," and "time n" in figure 1, while the "peak" of emotions is represented by the variable intensity of affective events.

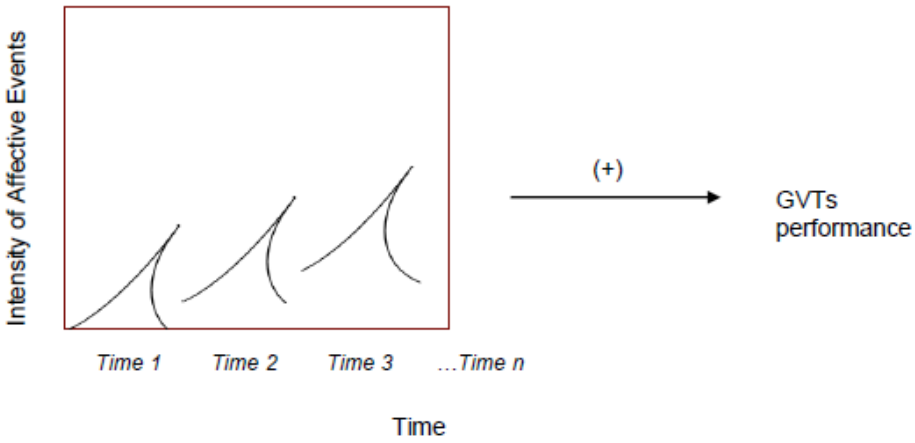

Figure 1: Dynamic Model of Global Virtual Teams (GVTs)
Source: Prepared by Mironko and Rivas

In this model, we also suggest that the stage of development of group dynamics may determine whether the emotions are displayed. Gersick (1989, 285) has identified "jumps," or periods of punctuated equilibrium in a group's development, during which social and task processes can change markedly. As emotions are an inherent part and indicator of this change process (Gersick 1989), it seems likely that these times of transition in work teams would also increase the display of emotions in most teams. In figure 1, we relate each stage of the group development to time. For example, stage 1 corresponds to time 1, stage 2 to time 2, and so on. Finally, the model indicates that the increase in the intensity of affective events over time, due to the approaching deadline, will influence the final performance of GVTs.

Hypothesis Development

Time Urgency in GVTs

The relevance of time in groups is found to be a defining part of group processes (Arrow et al. 2004; Barsade and Knight 2015; Gersick 1989; Mohammed and Angell 2004). According to the literature, team members' concerns about the time frame and priorities of a task may be significantly different, and these differences can affect group processes and elicit emotions, especially as a deadline approaches. For example, time-urgent team members, those for whom a deadline feels urgent, may request that others work on a task right away, while team members who do not feel that urgency may work on a task only when a deadline is close (Barsade and Knight 2015; Mohammed and Angell 2004).

Because GVTs will experience time urgency every time they are facing a deadline, deadlines represent a "jump" that will increase the level of affective events. Therefore, we offer the following hypothesis:

H1: the intensity of affective events in GVTs increases as time urgency increases.

Emotions in GVTs over Time

Arrow et al. (2004) have mentioned progress on the understanding of time's role in teamwork, and they recognize that more work on the temporal perspective is needed. Accordingly, the authors of this study have discussed variations of group processes over time. For instance, three types of processes occur in groups over time: transition, action, and interpersonal. To elaborate, transition processes are activities related to preparation for future work; action processes take place when the work is being done; and interpersonal processes refer to both motivation and conflict management (Eddy, Tannenbaum, and Mathieu 2013; Villado and Arthur 2013). Specifically, Ayoko, Konrad, and Boyle (2012) found patterns of emotional behavior that characterize virtual teams, which varies according to the stages of a team's life cycle; they are less intense at the beginning and end of the life cycles and more intense in the middle (Ayoko, Konrad, and Boyle 2012).

Following these ideas, we propose that when affective events in VTs are related to interpersonal conflict and tension, the intensity of these events will increase over time. However, when affective events help to speed teamwork, promote task-related discussions, and boost creativity, the intensity of these events will decrease over time as the task nears completion. Therefore, we offer the following hypotheses:

> H2: the intensity of affective events in GVTs increases over time as the deadlines approach.

Affective Events and Performance

Emotions have a direct influence on quasi-affective group outcomes, such as group cooperativeness and other socio-cognitive processes, as well as on non-affective outcomes, such as group performance and financial status (Barsade and Knight 2015; Kelly and Barsade 2001). To this end, group interventions have been developed to explicitly encourage or discourage emotional expression to improve group performance (Van De and Delbecq 1971).

Positive emotions, such as pride or encouragement, and negative emotions, such as disgust or anger, are both found in teams (Ayoko, Konrad, and Boyle 2012), and these emotions are intentionally influenced by individuals in order to advance specific goals (Kelly and Barsade 2001; Emich and Vincent 2020). We propose that when the level of an affective event is high, the level of team performance will also be high. Therefore, we offer the following hypotheses:

> H3: GVTs that show a high level of affective events will have a higher final performance.

Methodology

Data Description and Analysis

In this article, a longitudinal data set has been used to measure a number of variables across multiple steps of the project. The project included students from over forty universities

throughout the world. The data was obtained from the X-Culture project, wherein students, each from a different country, work in GVTs on a project lasting just over two months. The data was collected for almost an entire semester comprising weekly activities, submissions, team, and self-assessments on a number of criteria, and opinions of self and team members. Participation in the project was exclusively online, and members use only asymmetric communication and perform interdependent tasks toward a common objective. The data set consisted of the N 853 observations with a complete data set for each variable.

Linear regression analysis was used to determine coefficients between the variables. A linear regression is operationalized by the following equation: $Y = a + bX$, where X is the explanatory variable and Y is the dependent variable. The final grade was treated as a dependent variable, with data on assessments of students' own performance and performances of peers treated as independent variables. Additionally, the following variables were used to test for the intensity of affective events throughout the stages of the teams' performance. These variables are defined as follows.

Variables Measurement

Affective Events

In this study, affective events have been defined as any display of emotion (joy, excitement, sadness, anger, etc.) that appears in response to team interactions and has the potential to affect work outcomes (Ayoko, Konrad, and Boyle 2012; Weiss and Cropanzano 1996). Emotions can create dissonance between an individual's self-perception of their performance and others' perception thereof, and receiving feedback can help a person adjust their behavior (DeRue et al. 2012).

Engelmann and Pogosyan (2013) discuss how culture can influence visual perception, such as the perception of depth and color. They also explore how cultural differences in attentional processes can affect learning and memory, as well as how cultural experiences can affect reasoning and decision-making. They further examine how culture affects cognitive mechanisms such as perception, attention, memory, and reasoning. The authors argue that cultural experiences shape cognitive processes, influencing how individuals perceive and interpret the world around them. The authors provide examples of how culture can influence cognitive mechanisms, such as the role of language in shaping perception and the impact of cultural values on reasoning strategies. They also highlight the importance of considering cultural differences in cognitive mechanisms when conducting research, particularly in cross-cultural studies.

Following these ideas, affective events were measured through a proxy that consisted of the differences between self-perception of a performance and others' perception of the same performance. We expected that a greater difference between self-perception and others' perceptions of individual performances would represent a higher intensity level of an affective event. One way team members had to communicate their emotions was in the peer

evaluation, which occurred immediately after a task was completed. In the sample, teams were required to complete six self and peer evaluations. The results of the peer evaluations were shared with the participants before they started another team task, and it was expected that students would adjust their behavior accordingly. The following are the descriptions of both divergent and convergent dimensions (Elfenbein 2014) measured in the peer and self-evaluations at each step of the activities throughout the duration of the project:

- Effort: evaluation of one's own and peers' helpfulness during the entire project (not just the final week).
- Ideas: valuing of intellectual contribution, quality of the ideas shared during the entire project, viewing of the ideas of others as less valuable than one's own can be used as a proxy for conflict.
- Leadership: support in the coordination of the project throughout, something that Collins et al. (2013) call interpersonal influence based on interaction and emotional intelligence (EI) of the teams.
- Friendliness: being supportive and helpful in taking the project further while also creating group's affective tone, with 1 = Very negative; 2 = Negative; 3 = OK; 4 = Friendly; 5 = Very friendly.
- Work Ethic: delivering work as agreed to throughout the duration of the project.

The Likert scale (1932) is used to allow respondents to express how much they agreed or disagreed with a particular statement or a question. Each variable considers responses on the participant's own performance and those of their peers. Unless indicated otherwise, the scale ranged from 1 = Poor to 5 = Excellent performance.

Time Urgency

In this study, time urgency has been defined as the closeness of a deadline in a GVT work (Gersick 1989; Mohammed and Angell 2004), with a GVT work deadline being the end of a phase in which each team must make a decision, complete a task, or submit a result. At the end of each of these phases, members self-assessed their own performance and received the feedback of their team members. Similar to the study of Collins et al. (2013), group affective tone, either positive or negative, tested through the presented variables during the activity stages described next, have an impact on team members' affective experience and subsequently may also influence outcomes (George 1990). In the tested sample, teams had eight deadlines:

1) Select a company: After a meet-and-greet, participants in their GVTs explored company challenges and decided on one company to research, after which they offered a proposal to the corporate team.

2) Industry survey: Team members divided the work and researched the industry trends as they related to the project.
3) Brainstorming: Potential alternative steps were explored and discussed to analyze a solution to the problem.
4) Initial decision: The proposed solutions to the project challenge were agreed on.
5) Extended outline: The extended outline was submitted.
6) Rough draft: The draft proposal was submitted.
7) Complete draft: The final proposal was submitted.
8) Final project: After the submission of the final proposal and executive summary, students reflected on and evaluated their own and their peers' performances in the post-project survey.

Time

Time has been used as a variable in previous teamwork studies (Arrow et al. 2004; Ayoko, Konrad, and Boyle 2012). In this study, time has been defined as the number of weeks teams spent working to provide a business plan for an international company. Each week, teams were to make a decision or deliver a written assignment; at the end of the project, teams submitted a final proposal and executive summary. In this sample, teams were required to work together for eight weeks.

Performance

Team performance is a common variable in VT literature (Ayoko, Konrad, and Boyle 2012; Baltes et al. 2002). Following those studies, team performance in this study was defined in terms of the final grade obtained in the project and the satisfaction of the team members with the final result. The following is the description of the two variables used to measure performance:

- The final grade in the project, which was based on a number of evaluation criteria of each element of the project, along with the economic feasibility of the proposed solution or course of action.
- The satisfaction of the team members was measured in the post-project survey.

Necessary Condition Analysis (NCA)

In addition to the correlations between the proposed variables, a test for the Necessary Condition Analysis (NCA), introduced by Dul (2016), was also run. It provided a robustness check for the selected variables and offered a secondary method for testing the hypothesis. The NCA is used for identifying necessary conditions in data sets, with a necessary condition being a critical factor of an outcome: if the condition is not in place, the outcome will not occur.

To answer the questions posed in this study, the NCA method was used to test which of the proposed variables would satisfy the condition of being necessary, although not sufficient, to determine that a condition (X) is necessary for the outcome (Y).

In any activity, a single condition can be a bottleneck for the desired outcome. If the necessary condition is not in place, the activity can fail, and this cannot be mediated by other variables. In addition, however, having the condition in place does not guarantee success. In this case, the condition is necessary but not sufficient. To prevent failure, every single necessary condition must be in place (Dul 2016).

In this test, an NCA also tested what level of outcome was necessary (Vis and Dul 2018), hence providing a view as to a degree and differentiating between the variables based on their strength. Looking deeper into the results allowed for more nuanced relationships between the variables to be demonstrated.

Results

The findings related to the intensity of the teams' affective events were measured by effort. The results revealed correlations between coefficients of the tested variables to demonstrate overall support for hypothesis 1. It was found that the level of affective events increased as a deadline approached, as shown by the correlation coefficient between self and peer evaluations of effort at the cross section of the third week of the project and again the week before the final submission was due, which demonstrates a strengthening correlation between the periods. This result supports the earlier theory that, as a deadline approaches, a team needs to pull together in spite of any differences or existing emotions between the team members.

To address hypothesis 2, a correlation was run for the "enjoyed the team" variable in the third week of the project and the week before the final submission was due. The correlation coefficient between the variables showed a decline, the interpretation of which was that increasing pressure of a deadline led to differences of opinion within the team and therefore lower enjoyment of the team. This leads to hypothesis 3, which examined how the teams worked together and their final grade; teams that had a high level of affective events were found to have higher final performance. This measure (see Table 1, h. 3) reflects a relatively strong correlation coefficient between the variables. The data does not allow for the type of interaction, supportive or combative, to be determined; however, it does demonstrate a strong correlation between the variables, which also supports the existing theory that teams that work through conflict during their project deliver better results than teams that did not encounter conflict.

Table 1: Coefficient Results between Variables

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Multiple R*	*R Square*
Self and Peer Effort week 3 (H1)	0.793	0.053	15.076	1.08	0.459	0.211
Self and Peer Effort week of final submission (H1)	0.806	0.039	20.691	2.33	0.579	0.335
Enjoy Team week 2 (H2)	0.397	0.031	12.721	4.57	0.399	0.159
Enjoy team average and peer evaluation last week (H2)	10.086	1.087	9.276	1.42	0.303	0.092
Peer Eval: Closely Worked and Overall grade (H3)	0.479	0.024	19.565	1.13	0.557	0.310
N—853						

Source: Prepared by Mironko and Rivas

The results of the NCA on teams' performances showed a stepwise level of the correlation between two variables and helped to determine which variable was necessary for the success of the team. The level of collaboration necessary to achieve a particular level of grade can be seen in the graphical presentation in Figure 2.

The results provided insights into the dynamics of the inner workings of VTs over time. A number of stages and interactions between the team members were tested at the designated points throughout the duration of the project. Earlier studies on the subject have generally tested relationships between team members in a single interaction. However, as stated previously, the true test of teams' dynamics is spread over the duration of multiple projects or a single project with a number of consecutive steps, where team members have different levels of contribution, expertise, and engagement as the project develops.

Table 2: Descriptive Statistics

	1	*2*	*3*	*4*	*5*	*6*	*7*
Mean	86.678	4.443	4.283	83.833	4.816	4.035	3.413
Standard Error	1.194	0.048	0.045	1.588	0.034	0.057	0.053
Standard Deviation	15.756	0.631	0.599	20.953	0.444	0.748	0.703
Sample Variance	248.243	0.398	0.359	439.030	0.197	0.560	0.494
Range	100	2	3	100	2	4	3.6
Minimum	0	3	2	0	3	1	1.6
Maximum	100	5	5	100	5	5	5
Conf. Lev. (95%)	2.358	0.094	0.090	3.135	0.066	0.112	0.105

Description of the measures: 1: Enjoy Team at Meet and Greet; 2: Self-Evaluation of Effort at Meet and Greet; 3: Peer Evaluation of Effort at the Meet and Greet; 4: Enjoy Team at the Complete Draft; 5: Self-Evaluation Effort at the Complete Draft; 6: Peer Evaluation Effort at Complete Draft; 7: Peer Evaluation Closely Worked at the Post-Project Survey.

Source: Prepared by the Mironko and Rivas

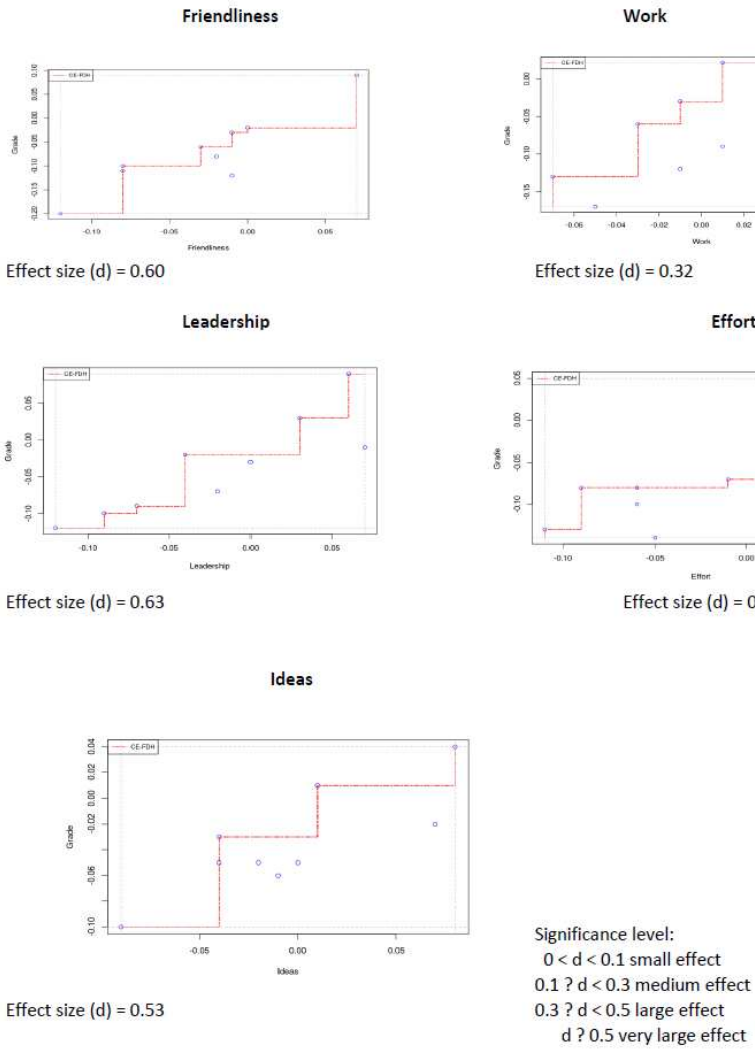

Figure 2: The Results of the Necessary Condition Analysis between the Final Grade and the Select Variables
Source: Prepared by Mironko and Rivas

Conclusion

In this article, it has been demonstrated that the level of affective events is related to a project's deadline, varies over time, and affects team performance. Earlier studies of virtual team dynamics focused on their ability to problem-solve and utilize each member's unique talents to contribute to a successful performance. The findings of this study demonstrate that there is a direct correlation between teams' affective events and their final performance. The results may be interpreted as follows: teams that are aware of their emotions will have team members who are able to resolve the differences that influence the intensity of the affective events and move on with the project more quickly. Alternatively, this can also

mean that the affective events are related to the substantive issues related to the project rather than being personal disagreements; hence there is a focus on common goals.

Furthermore, these results reveal that a clear understanding of the project timeline and focus on the final objective are strongly correlated and are the guiding motivators for team performance. These findings complement recent literature on a successful collaboration in VTs, which argues that a team's development of trust and ability to resolve problems supports their successful performance. This follows the supposition by earlier studies: teams that understand how people from different cultures make decisions differently and are able to allocate work based on the team members' strengths perform the best (Jackson et al. 1995; Rath and Conchie 2008).

The results presented here also complement recent literature on the performance of global virtual teams by having analyzed the effect of team interactions and affective events in terms of approaching deadlines. Moreover, the ability of teams to resolve problems as deadlines approach provides the time urgency dimension of focusing on a common purpose. Therefore, the recognition of an approaching deadline seems to foster problem resolution.

The data used in this study allowed for the analysis of the various steps that take place in the progression of a project. Understanding the concept of dynamics in GVTs warrants increasing importance for the performance of globally dispersed firms. This will create an opportunity for future exploration and a deeper understanding of GVTs as the teams become more culturally diverse and of technology, which allows for instant communication and collaboration around the globe to become more ubiquitous and adoptive.

Finally, this study provides insights into the relationship between affective events, time urgency, and team performance in a global virtual team environment. The findings suggest that the intensity of affective events experienced by team members, as measured by the differences between self-perception and others' perception of individual performances, can impact team performance. Additionally, time urgency, as measured by the closeness of a deadline, was found to have a significant impact on team performance. This study contributes to the existing literature on GVTs by providing new insights into the relationships between variables and can be useful for practitioners in improving the effectiveness of global virtual teamwork. The results of this study can be used to inform future research in the area of GVTs and can also be used by educators to improve the design of GVT projects in their courses.

REFERENCES

Arrow, Holly, Marshall Scott Poole, Kelly Bouas Henry, Susan Wheelan, and Richard Moreland. 2004. "Time, Change, and Development: The Temporal Perspective on Groups." *Small Group Research* 35 (1): 73–105. https://doi.org/10.1177/1046496403259757.

Aubert, Benoit A., and Barbara L. Kelsey. 2003. "Further Understanding of Trust and Performance in Virtual Teams." *Small Group Research* 34 (5): 575–618. https://doi.org/10.1177/1046496403256011.

Axtell, Carolyn M., Steven J. Fleck, and Nick Turner. 2004. "Virtual Teams: Collaborating Across Distance." *International Review of Industrial and Organizational Psychology* 19:205–248.

Ayoko, Oluremi B., Alison M. Konrad, and Maree V. Boyle. 2012. "Online Work: Managing Conflict and Emotions for Performance in Virtual Teams." *European Management Journal* 30 (2): 156–174. https://doi.org/10.1016/j.emj.2011.10.001.

Baltes, Boris B., Marcus W. Dickson, Michael P. Sherman, Cara C. Bauer, and Jacqueline S. LaGanke. 2002. "Computer-Mediated Communication and Group Decision Making: A Meta-analysis." *Organizational Behavior and Human Decision Processes* 87 (1): 156–179. https://doi.org/10.1006/obhd.2001.2961, http://www.idealibrary.com.

Barak, Azy, Meyran Boniel-Nissim, and John Suler. 2008. "Fostering Empowerment in Online Support Groups." *Computers in Human Behavior* 24 (5): 1867–1883. https://doi.org/10.1016/j.chb.2008.02.004.

Barsade, Sigal G. 2002. "The Ripple Effect: Emotional Contagion and its Influence on Group Behavior." *Administrative Science Quarterly* 47 (4): 644–675. https://doi.org/10.2307/3094912.

Barsade, Sigal G., and Donald E. Gibson. 2007. "Why Does Affect Matter in Organizations?" *Academy of Management Perspectives* 21 (1): 36–59. https://doi.org/10.5465/amp.2007.24286163.

Barsade, Sigal G., and Andrew P. Knight. 2015. "Group Affect." *Annual Review of Organizational Psychology and Organizational Behavior* 2 (1): 21–46. https://doi.org/10.1146/annurev-orgpsych-032414-111316.

Becker, William J., Russell Cropanzano, Phoenix Van Wagoner, and Ksenia Keplinger. 2018. "Emotional Labor within Teams: Outcomes of Individual and Peer Emotional Labor on Perceived Team Support, Extra-Role Behaviors, and Turnover Intentions." *Group & Organization Management* 43 (1): 38–71. https://doi.org/10.1177/1059601117707608.

Beersma, Bianca, John R. Hollenbeck, Stephen E. Humphrey, Henry Moon, Donald E. Conlon, and Daniel R. Ilgen. 2003. "Cooperation, Competition, and Team

Performance: Toward a Contingency Approach." *Academy of Management Journal* 46 (5): 572–590.

Bhat, Swati Kaul, Neerja Pande, and Vandana Ahuja. 2017. "Virtual Team Effectiveness: An Empirical Study Using SEM." *Procedia Computer Science* 122:33–41

Bradley, Bret H., Anthony C. Klotz, Bennett E. Postlethwaite, and Kenneth G. Brown. 2013. "Ready to Rumble: How Team Personality Composition and Task Conflict Interact to Improve Performance." *Journal of Applied Psychology* 98 (2): 385. https://doi.org/10.1037/a0029845.

Cohen, Melissa A., Steven G. Rogelberg, Joseph A. Allen, and Alexandra Luong. 2011. "Meeting Design Characteristics and Attendee Perceptions of Staff/Team Meeting Quality." *Group Dynamics: Theory, Research, and Practice* 15 (1): 90.

Collins, Amy L., Sandra A. Lawrence, Ashlea C. Troth, and Peter J. Jordan. 2013. "Group Affective Tone: A Review and Future Research Directions." *Journal of Organizational Behavior* 34 (S1): S43–S62. https://doi.org/10.1002/job.1887.

De Dreu, Carsten K. W., and Laurie R. Weingart. 2003. "Task Versus Relationship Conflict, Team Performance, and Team Member Satisfaction: A Meta-Analysis." *Journal of Applied Psychology* 88 (4): 741. https://doi.org/10.1037/0021-9010.88.4.741.

Degbey, William Y., and Katja Einola. 2020. "Resilience in Virtual Teams: Developing the Capacity to Bounce Back." *Applied Psychology 69* (4): 1301–1337. https://doi.org/10.1111/apps.12220.

DeRue, D. Scott, Jennifer D. Nahrgang, John R. Hollenbeck, and Kristina Workman. 2012. "A Quasi-Experimental Study of After-Event Reviews and Leadership Development." *Journal of Applied Psychology* 97 (5): 997.

Diefendorff, James M., and Erin M. Richard. 2003. "Antecedents and Consequences of Emotional Display Rule Perceptions." *Journal of Applied Psychology* 88 (2): 284. https://doi.org/10.1037/0021-9010.88.2.284.

Dul, Jan. 2016. "Necessary Condition Analysis NCA Logic and Methodology of 'Necessary but not Sufficient' Causality." *Organizational Research Methods* 19 (1): 10–52. https://doi.org/10.1177/1094428115584005.

Eddy, Erik R., Scott I. Tannenbaum, and John E. Mathieu. 2013. "Helping Teams to Help Themselves: Comparing Two Team-Led Debriefing Methods." *Personnel Psychology* 66 (4): 975–1008. https://doi.org/10.1111/peps.12041.

Elfenbein, Hillary Anger. 2014. "The Many Faces of Emotional Contagion: An Affective Process Theory of Affective Linkage." *Organizational Psychology Review* 4 (4): 326–362. https://doi.org/10.1177/2041386614542889.

Emich, Kyle J., Satish Kumar, Li Lu, Kurt Norder, and Nitesh Pandey. 2020. "Mapping 50 Years of Small Group Research Through Small Group Research." *Small Group Research* 51 (6): 659–699. https://doi.org/10.1177/1046496420934541.

Emich, Kyle J., and Lynne C. Vincent. 2020. "Shifting Focus: The Influence of Affective Diversity on Team Creativity." *Organizational Behavior and Human Decision Processes* 156:24–37. https://doi.org/10.1016/j.obhdp.2019.10.002.

Erez, Miriam, Alon Lisak, Raveh Harush, Ella Glikson, Rikki Nouri, and Efrat Shokef. 2013. "Going Global: Developing Management Students' Cultural Intelligence and Global Identity in Culturally Diverse Virtual Teams." *Academy of Management Learning & Education* 12 (3): 330–355. https://doi.org/10.5465/amle.2012.0200.

Fineman, Stephen, Sally Maitlis, and Niki Panteli. 2007. "Themed Articles: Virtuality and Emotion: Introduction." *Human Relations* 60 (4): 555–560. https://doi.org/10.1177/0018726707078346.

Fisher, David M. 2014. "Distinguishing Between Taskwork and Teamwork Planning in Teams: Relations with Coordination and Interpersonal Processes." *Journal of Applied Psychology* 99 (3): 423. https://doi.org/10.1037/a0034625.

George, Jennifer M. 1990. "Personality, Affect, and Behavior in Groups." *Journal of Applied Psychology* 75 (2): 107. https://doi.org/10.1037/0021-9010.75.2.107.

Gersick, Connie J. G. 1989. "Marking Time: Predictable Transitions in Task Groups." *Academy of Management Journal* 32 (2): 274–309. https://journals.aom.org/doi/10.5465/256363.

Gibson, Cristina B., and Jennifer A. Manuel. 2003. "Building Trust." In *Virtual Teams That Work: Creating Conditions for Virtual Team Effectiveness*, edited by Cristina B. Gibson and Susan G. Cohen, 59–86. San Francisco, CA: Jossey-Bass.

Gilson, Lucy L., M. Travis Maynard, and Erich B. Bergiel. 2013. "Virtual Team Effectiveness: An Experiential Activity." *Small Group Research*44 (4): 412–427. https://doi.org/10.1177/1046496413488216.

Gladstein, Deborah L. 1984. "Groups in Context: A Model of Task Group Effectiveness." *Administrative Science Quarterly* 29 (4) 499–517. https://doi.org/10.2307/2392936.

Hambley, Laura A., Thomas A. O'Neill, and Theresa J. B. Kline. 2007. "Virtual Team Leadership: Perspectives from the Field." *International Journal of e-Collaboration* 3 (1): 40–64. https://doi.org/10.4018/jec.2007010103.

Hassett, Melanie E., Riikka Harikkala-Laihinen, Niina Nummela, and Johanna Raitis. 2018. "Emotions and Virtual Teams in Cross-Border Acquisitions." *Individual, Relational, and Contextual Dynamics of Emotions* 14:163–187. https://doi.org/10.1108/S1746-979120180000014016.

Hatfield, Elaine, John T. Cacioppo, and Richard L. Rapson. 1994. *Emotional Contagion*. Paris: Cambridge University Press.

Hobman, Elizabeth V., Prashant Bordia, and Cynthia Gallois. 2003. "Consequences of Feeling Dissimilar from Others in a Work Team." *Journal of Business and Psychology* 17:301–325. https://doi.org/10.1023/A:1022837207241.

Jackson, Susan E., Karen E. May, Kristina Whitney, Richard A. Guzzo, and Eduardo Salas. 1995. "Understanding the Dynamics of Diversity in Decision-Making Teams." *Team Effectiveness and Decision Making in Organizations* 204:261.

Jarvenpaa, Sirkka L., and Dorothy E. Leidner. 1999. "Communication and Trust in Global Virtual Teams." *Organization Science* 10 (6): 791–815. https://doi.org/10.1287/orsc.10.6.791.

Jordan, Peter J., and Ashlea C. Troth. 2002. "Emotional Intelligence and Conflict Resolution: Implications for Human Resource Development." *Advances in Developing Human Resources* 4 (1): 62–79. https://doi.org/10.1177/1523422302004001005.

Kelly, Janice R., and Sigal G. Barsade. 2001. "Mood and Emotions in Small Groups and Work Teams." *Organizational Behavior and Human Decision Processes* 86 (1): 99–130. https://doi.org/10.1006/obhd.2001.2974, http://www.idealibrary.com.

Lee, JungHoon Jay, and Chihyung Ok. 2012. "Reducing Burnout and Enhancing Job Satisfaction: Critical Role of Hotel Employees' Emotional Intelligence and Emotional Labor." *International Journal of Hospitality Management* 31 (4): 1101–1112. https://doi.org/10.1016/j.ijhm.2012.01.007.

Mannix, Elizabethc A., Terri Griffith, and Magaret A. Neale. 2002. "The Phenomenology of Conflict in Distributed Work Teams." In *Distributed Work*, edited by Pamela J. Hinds and Sara Kiesler, 213–233. Cambridge, MA: MIT Press. https://doi.org/10.7551/mitpress/2464.003.0015.

Marks, Michelle A., John E. Mathieu, and Stephen J. Zaccaro. 2001. "A Temporally Based Framework and Taxonomy of Team Processes." *Academy of Management Review* 26 (3): 356–376. https://doi.org/10.5465/amr.2001.4845785.

Marlow, Shannon L., Christina N. Lacerenza, and Eduardo Salas. 2017. "Communication in Virtual Teams: A Conceptual Framework and Research Agenda." *Human Resource Management Review* 27 (4): 575–589. https://doi.org/10.1016/j.hrmr.2016.12.005.

Martins, Luis L., Lucy L. Gilson, and M. Travis Maynard. 2004. "Virtual Teams: What Do We Know and Where Do We Go from Here?" *Journal of Management* 30 (6): 805–835. https://doi.org/10.1016/j.jm.2004.05.002.

McGrath, Joseph E. 1991. "Time, Interaction, and Performance TIP A Theory of Groups." *Small Group Research* 22 (2): 147–174. https://doi.org/10.1177/1046496491222001.

Mironko, Arkadiusz, Rosemary M. Muriungi, and Anthony J. Scardino. 2022. "The Changing Technology Use and its Impact on Leadership and Hierarchy Structure in the Virtual Workplace." In *Business Advancement through Technology Volume II: The Changing Landscape of Industry and Employment*, edited by Alkis Thrassou, Demetris Vrontis, Leonidas Efthymiou, Yaakov Weber, S. M. Riad Shams, and Evangelos Tsoukatos, 87–108. Cham: Springer International Publishing. https://doi.org/10.1007/978-3-031-07765-4_12.

Mohammed, Susan, and Linda C. Angell. 2004. "Surface and Deep-Level Diversity in Workgroups: Examining the Moderating Effects of Team Orientation and Team

Process on Relationship Conflict." *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior* 25 (8): 1015–1039. https://doi.org/10.1002/job.293.

Morris, J. Andrew, and Daniel C. Feldman. 1996. "The Dimensions, Antecedents, and Consequences of Emotional Labor." *Academy of Management Review* 21 (4): 986–1010. https://doi.org/10.5465/amr.1996.9704071861.

Mortensen, Mark, and Pamela J. Hinds. 2001. "Conflict and Shared Identity in Geographically Distributed Teams." *International Journal of Conflict Management*. 12 (3): 212–238. https://doi.org/10.1108/eb022856.

Nair, Nisha. 2008. "Towards Understanding the Role of Emotions in Conflict: A Review and Future Directions." *International Journal of Conflict Management* 19 (4): 359–381. https://doi.org/10.1108/10444060810909301.

Neuman, George A., and Julie Wright. 1999. "Team Effectiveness: Beyond Skills and Cognitive Ability." *Journal of Applied Psychology* 84 (3): 376. https://doi.org/10.1037/0021-9010.84.3.376.Engelmann, Jan B., and Marianna Pogosyan. 2013. "Emotion Perception across Cultures: The Role of Cognitive Mechanisms." *Frontiers in Psychology* 4:118. https://doi.org/10.3389/fpsyg.2013.00118.

Rafaeli, Anat, and Robert I. Sutton. 1987. "Expression of Emotion as Part of the Work Role." *Academy of Management Review* 12 (1): 23–37. https://doi.org/10.5465/amr.1987.4306444.

Rath, Tom, and Barry Conchie. 2008. *Strengths Based Leadership: Great Leaders, Teams, and Why People Follow*. New York: Gallup Press.

Riopelle, Kenneth, Julia C. Gluesing, Tara C. Alcordo, Marietta Baba, David Britt, Willie McKether, Leslie Monplaisir, Hilary Horn Ratner, and Kimberly Harris Wagner. 2003. "Context, Task, and the Evolution of Technology Use in Global Virtual Teams." In *Virtual Teams That Work: Creating Conditions for Virtual Team Effectiveness*, edited by Cristina B. Gibson Susan G. Cohen, 239–264. San Francisco: Jossey-Bass Publisher.

Taylor, Shelley E. 1991. "Asymmetrical Effects of Positive and Negative Events: The Mobilization-Minimization Hypothesis." *Psychological Bulletin* 110 (1): 67. https://doi.org/10.1037/0033-2909.110.1.67.

Thomas, David C., and Mark F. Peterson. 2018. *Cross-Cultural Management: Essential Concepts.* California: Sage Publications, 2018.

Townsend, Anthony M., Samuel M. DeMarie, and Anthony R. Hendrickson. 2000. "Virtual Teams: Technology and the Workplace of the Future." *IEEE Engineering Management Review* 28 (2): 69–80. https://doi.org/10.5465/ame.1998.1109047.

Van De, Andrew, and Andre L. Delbecq. 1971. "Nominal Versus Interacting Group Processes for Committee Decision-Making Effectiveness." *Academy of Management Journal* 14 (2): 203–212. https://journals.aom.org/doi/10.5465/255307.

Van Kleef, Gerben A., Carsten K. W. De Dreu, and Antony S. R. Manstead. 2004. "The Interpersonal Effects of Anger and Happiness in Negotiations." *Journal of Personality and Social Psychology* 86 (1): 57.

Van Knippenberg, Daan, and Michaela C. Schippers. 2007. "Work Group Diversity." *Annual Review of Psychology* 58:515–541.

Villado, Anton J., and Winfred Arthur Jr. 2013. "The Comparative Effect of Subjective and Objective After-Action Reviews on Team Performance on a Complex Task." *Journal of Applied Psychology* 98 (3): 514. https://doi.org/10.1037/a0031510.

Vis, Barbara, and Jan Dul. 2018. "Analyzing Relationships of Necessity not Just in Kind but Also in Degree: Complementing fsQCA with NCA." *Sociological Methods & Research* 47 (4): 872–899. https://doi.org/10.1177/0049124115626179.

Weiss, Howard M., and Russell Cropanzano. 1996. "Affective Events Theory." *Research in Organizational Behavior* 18 (1): 1–74.

Zaccaro, Stephen J., and Paige Bader. 2003. "E-Leadership and the Challenges of Leading E-Teams: Minimizing the Bad and Maximizing the Good." *Organizational Dynamics*. 31 (4): 377–387. https://doi.org/10.1016/S0090-2616(02)00129-8.

Zettinig, Peter, Audra I. Mockaitis, and Lena Zander. 2016. "Students as Global Virtual Team Leaders: A Model for Enquiry-Based Experiential Learning." In *The Palgrave Handbook of Experiential Learning in International Business*, edited by Vas Taras and Maria Alejandra Gonzalez-Perez, London: Palgrave Macmillan. https://link.springer.com/chapter/10.1057/9781137467720_4.

ABOUT THE AUTHORS

Arkadiusz Mironko: Associate Professor of Management and Entrepreneurship, School of Business and Economics, Indiana University East, Richmond, Indiana, USA
Corresponding Author's Email: amironko@iu.edu

Jaynne Rivas: Assistant Professor of Management, School of Business and Economics, Indiana University East, Richmond, Indiana, USA
Email: jarivas@iu.edu