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Perspectives on Emotional Climate Associated with Classroom Interactions

Hiro Komatsubara
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Perspectives on Emotional Climate Associated with Classroom Interactions

by

Hiro Komatsubara

A dissertation submitted to the Graduate Faculty in Urban education in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

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Hiro Komatsubara

This manuscript has been read and accepted for the Graduate Faculty in Urban Education in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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THE CITY UNIVERSITY OF NEW YORK
ABSTRACT

Perspectives on Emotional Climate Associated with Classroom Interactions

by

Hiro Komatsubara

Advisor: Konstantinos Alexakos

It is difficult for students to learn and teachers to teach in today’s classroom environment especially when events involving strong emotional contradictions occur in classrooms. Such events may elicit emotions that negative affect, teaching, learning and wellness. Various studies show that high levels of negative emotions create stressful classroom environments, and that a positive Emotional Energy (EE) in the classroom encourages attentiveness, enthusiasm and interest. Therefore, it is highly likely that creating calm learning environments by ameliorating classroom participants’ emotional intensity and increasing their mindfulness and awareness will produce positive outcomes. Using both quantitative and qualitative measures this study examines participant-level, self-reported, Emotional Climate (EC) data variables that were collected from a Brooklyn College (BC) study of a preservice/inservice science teacher education program. Consistent with event-oriented inquiry this research identifies events of “what is happening” and “why it is happening” by analyzing video/audio recording files associated with the aggregate EC data.
KEY WORDS: emotional climate (EC), emotional energy (EE), interaction rituals chains, event-oriented study, interpretive analysis
For HANAMIZUKI BESS
# Table of Contents

Table of Contents ........................................................................................................................................................................ vii
List of Figures .................................................................................................................................................................................... x
List of Tables ..................................................................................................................................................................................... xii

## CHAPTER 1: INTRODUCTION ........................................................................................................................................................................ 1

1.1 Introduction—Discussion of the Research Background ....................................................................................................................... 1
1.2 What is Emotion? ..................................................................................................................................................................................... 3
1.3 Theories of Emotion ............................................................................................................................................................................... 5
Turner’s Taxonomy of Human Emotions ................................................................................................................................................. 7
1.4 Measuring/Enumeration of Emotion—Self-Reported Emotion Measurement ......................................................................................... 9
  1.4.1 Definition of EC and Its Parity Reflected by EE and to EE ............................................................................................................. 9
  1.4.2 Measuring/Enumeration of Emotions in Psychophysiology and the “Clicker” in Education ............................................................. 11
Measuring Emotional Valence and Emotional Arousal in Psychophysiology .......................................................................................... 11
  1.4.3 Human Emotion Representations—Visualizations of Emotion Utilizing Models & Plots ......................................................................................... 15
  1.4.4 Issues/Limitations of Measuring/Assessing Emotions Utilizing Self-Reported Rating ................................................................. 19
An Issue from Related Emotion Research in Education—Overall Positive Rating ........................................................................... 21
1.5 Interaction Ritual Theory, EE and EC—Forging Social Bonds/Solidarity .......................................................................................... 22
1.6 Dissertation Overview & the Roadmap .............................................................................................................................................. 27

## CHAPTER 2: RESEARCH DESIGN AND METHODOLOGY .......................................................................................................................... 30

2.1 Data Resources ..................................................................................................................................................................................... 30
  2.1.1 The Brooklyn College Study ......................................................................................................................................................... 30
  2.1.2 Video/Audio Recordings .......................................................................................................................................................... 32
Theoretical Frameworks of Human Emotion Research, Engaging Video/Audio Analysis ........................................................................ 33
  2.1.3 Heuristic Intervention .......................................................................................................................................................... 34
Cogenerative Dialogue ............................................................................................................................................... 34
2.2 Measuring and Calculating Emotion .................................................................................................................................................. 36
  2.2.1 Self-reported Emotion Measuring Tool Clicker Device Revisited .......................................................................................... 37
  2.2.2 Decision Making Process of Emotion Ratings ......................................................................................................................... 39
2.3 Research Design of the Landscape: Event-Oriented Interpretive Analyses ......................................................................................... 40

## CHAPTER 3: Likert Scale Rating Count for 13 Weeks of EC Data ................................................................................................. 43

3.1 Method Design of Macro Statistics Analysis Associated with Dialogic/Conversation Analysis ........................................................................ 43
6.1.1 Summary of Research in Chapter 3 ................................................................. 105
6.1.2 Summary of Research in Chapters 4 and 5 .................................................... 106
6.2 Next Steps ........................................................................................................... 108
  6.2.1 The Brooklyn College Study and Beyond ..................................................... 108
  6.2.2 Future Emotion Research in Education with Sociocultural Factors .............. 109
6.3 At Last.................................................................................................................. 113
  6.3.1 Emotion Barriers and Academic Success ..................................................... 113
  6.3.2 From Emotional Entrainment to World Transformations ............................. 115
Appendix A .................................................................................................................. 119
References ................................................................................................................... 120
List of Figures

Figure 1.1 One and Two-slider emotrace, vertical version. (Lottridge, 2010, p. 51) ...............13

Figure 1.2 An example of Self-Assessment Manikin Hardware Device
(http://sourceforge.net/projects/samhardware/).................................................................14

Figure 1.3 Clicker: Self-Reported Emotion Valence Input Device.................................15

Figure 1.4 2-D Emotion Model of Valence and Arousal in Psychophysiology Metrics—Emotion Recognition from Brain Signals Using Hybrid Adaptive Filtering and Higher Order Crossings Analysis (Petrantonakis & Hadjileontiadis, p.82, Fig. 1).........................16

Figure 1.5 Plutchik’s Model of Emotions (as cited in Turner, 2007, p. 6).........................17

Figure 1.6 Mean Emotional Climate (EC) as a Function of Time (Tobin et al., 2013)..........18

Figure 1.7 Dissertation Roadmap....................................................................................29

Figure 3.1 Total Frequency of Each Likert Scale Ratings for the Entire 13 weeks of the EC Data.............................................................................................................45

Figure 3.2 Proportion of Each Likert Scale Ratings for the Entire 13 weeks of the EC Data.....46

Figure 3.3 Mean Valence Variability for the Entire 13 weeks of the EC Data....................47

Figure 3.4 Total Frequency of Each Rating for the 1st Clicks of the EC Data for the Entire 13 weeks.........................................................................................................................49

Figure 3.5 Proportion of Each Rating for the 1st Clicks of the EC Data for the Entire 13 weeks.........................................................................................................................50

Figure 4.1 Mean EC Valence of Week #5 in the BC Study..............................................61

Figure 4.2 Mean of EC Valence Change............................................................................66

Figure 5.1 Presenters’ Displacement Activities during Their Presentation......................84

Figure 5.2 Standard Deviation Week #5..........................................................................93
Figure 5.3 Standard Deviation of Change of EC Week 5..................................................94
List of Tables

*Table 1.1* Turner’s Taxonomy of Human Emotions (Turner, 2007, p. 7, Table 1.2 Variants of primary emotions)……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………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CHAPTER 1: INTRODUCTION

The study of human emotions associated with, for examples, pulse rate, skin conductance, facial expressions, or body-movements has been an area of research mainly associated with psychology or psychophysiology. Today, the efficacy of human emotion research application is recognized not only by scholars in academic fields such as linguistics, computer science, philosophy, political science, even history. It has found a place in the interdisciplinary research goals of those studying education including studies of associations between physiological characteristics and instantaneous emotions (Tobin, 2013). Additionally, research on human emotion application has a role in video game development, medicine, and marketing. It is beneficial to understand emotional reactions toward objects, events, and the other people’s actions in both structure and agency.

1.1 Introduction—Discussion of the Research Background

This dissertation applies an interpretive landscape analysis of event-oriented social interactions within a preservice/inservice science teacher education classroom in the Brooklyn College Study that took place during the spring semester of 2012 (Alexakos, 2015). It adopts “a multi-method and multi-theoretic approach” (Tobin, Ritchie, Oakley, Mergard, & Hudson, 2013, p. 71) based on video/audio recording analysis and Emotional Climate (EC) data analysis that were pioneered and developed by Kenneth Tobin in the United States and by Alberto Bellocchi in Australia (K. Tobin, personal communication, January 25, 2016). The theoretical frameworks embedded in this research rely on research on emotions conducted by Turner (2007) and Ekman

Durkheim (1912/1965) and Goffman (1956/1967), followed by Collins (2004), suggest that Emotional Energy (EE) reflects the EC of particular social interactions. And Turner’s (2007) taxonomy of emotional valence defines four primary emotions: sadness, anger, fear, and happiness. Of these, three are experienced by individuals as having negative EC valence, and the fourth, happiness, has a positive EC valence (Tobin et al., 2013).

The emotional climate of particular events saturated with emotional energy (Tobin et al., 2013) “refers to the collective behavior that a group or a society manifests when it is focused on the emotional relationships existing between members of the society” (Kanyangara, Rimé, Philippot, & Yzerbyt, 2007, p. 388). Emotions saturate all structures of social life, and collective actions cannot be ignored (Sabucedo, Durán, Alzate & Barreto, 2010). In the field of education, “EC is produced by the micro-social processes of individual classrooms that are focused on social interactions between students, and teachers and students ... when members of a group or organization develop an enhanced sense of collective identity and decreased sense of self” (Bellocci et al., 2013, p. 3). The EC of particular “classroom events that significantly transform subsequent structures also are likely to involve unpredictable shifts in emotions” (Ritchie et al., 2011, p. 752). The detrimental effect of emotional barriers is so powerful that they can often impede academic success. They are profoundly familiar especially for college instructors working with at-risk students, yet education researchers and instructors have paid little attention to the emotional barriers to academic success or provided constructive responses to students when such barriers are noticed (Kannan & Miller, 2009). Bellocci et al. (2013) stated that “[a]s
far as science education is concerned, EC is a fertile area for research that has significant implications for theory production and transformation of practice” (p. 30).

I apply a polysemic methodology and theory—multi-method, multi-theoretical, and multi-level research (Tobin & Ritchie, 2012) to this hermeneutical interpretive reflexive analysis (van Manen, 1990) of event-oriented and authentic inquiry that Bellocchi et al. (2013), Tobin et al. (2013), and Ritchie et al. (2011) pioneered, and I build on their work through an exploration of visualizing the EC data.

The research questions in this study is “[w]hat is happening here specifically? What do these happenings mean to the people engaged in them” (Erickson, 1986, p. 124) and “[h]ow does what is happening here compare with what happens in other places” (Erickson, 1986, p. 124) by analyzing video/audio recording files associated with the aggregate EC data. Then, phenomena of events/interactions occurring in a classroom were interpreted to elucidate such questions by analyzing the data resources. EC analysis is the primary data analysis to be employed throughout this dissertation. The main research goals in the analyses are to identify the salience of research participants’ actions and meanings in the events occurring in this particular classroom/school setting from the multi-points of view of the research participants, and to understand how particular individuals are involved in such events by inquiring interpretively (Erickson, 1986).

1.2 What is Emotion?

Emotions are conditioned by socialization into culture and by participation in social structures (Turner & Stets, 2005). Terms such as affect, sentiment, feeling, mood, expressiveness, and emotion are sometimes used interchangeably and at other times, to denote a specific affective state (Turner, 2007). Cole, Martin, and Dennis (2004) noted that powerful,
elusive, dynamic processes of emotions have the capability to control other processes. Emotions are characteristically experienced over short period of time whereas moods may last longer period of time (Davidson, 1994), and temperament appears to be more innate to the personality of an individual (Lottridge, 2010). The most significant characteristic of emotion is the variation of individual differences (Davidson & Begley, 2012).

Thompson (1994) defined emotion regulation as: “the extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features to accomplish one’s goals” (pp. 27-28). Turner (2007), however, is reluctant to give an exact definition of human emotions because the definition of emotions varies depending on the viewing platform. He summarized different standpoints by disciplines:

- **“Biological Perspective: emotions involve changes in body systems – autonomic nervous system (ANS), musculoskeletal system, endocrine system, and neurotransmitter and neuroactive peptide systems – that mobilize and dispose an organism to behave in particular ways;”**
- **Cognitive Perspective: emotions are conscious feelings about self and objects in the environment;**
- **Cultural Perspective: emotions are the words and labels that humans give to particular physiological states of arousal” (p. 2).**

As I stated earlier, human emotion study is now not only a topic or a method tool for the field of psychophysiology or neurobiology. Lotridge (2010) asserts that emotions have been identified as a key issue in other disciplines. For example, in human-computer interaction, researchers recognize that the effective ergonomic designs of artifacts are naturally influenced by
the emotional responses they invoke. Through the event-oriented examination that this
dissertation undertakes, I will show that correlations between variability of human emotions and
regularities/contradictions in the classroom are keys for improving our classroom practices.

1.3 Theories of Emotion

Lang (1995) begins his account of human emotions, defining them psychophysiologicaly
by their valence and arousal. They are action dispositions that are motivated by two opposing
systems in the subcortical region of the brain. Emotions produce a valence that is either positive,
i.e., appetitive/pleasant, or negative, i.e., aversive/unpleasant, and emotion arousal ranges from
calm to excited. His study established that the identification of emotional valence and arousal
could be determined by physiological characteristics (p. 372). Lang (1995) found that
“pleasantness ratings, heart rate, and facial muscles tended to load onto one factor (valence)
while interest ratings and skin conductance tended to load on another (arousal)” (as cited in

It is proposed that two motive systems exist in the brain—appetitive and aversive—
accounting for the primacy of the valence dimension. Arousal is not viewed as having a
separate substrate, but rather, as reflecting variations in the activation (metabolic and
neural) of either or both systems (see also Cacioppo & Berntson, 1994). Tactical
demands of context may variously shape affects. All affects are, however, organized
around a motivational base. In this sense, valence and system arousal are the strategic
dimensions of the emotion world. (Lang, 1995, p. 374)
Early processes of emotional reflexes for approaching or avoiding stimuli are associated with metabolic function support for species survival. They are presumed to be “supplemented with more nuanced and deliberative emotional response, possibly due to the selective pressure created by increasingly complex social interactions that likely characterized early modern human (homo sapiens) life,” according to Fagan (2008) (as cited in Lottridge, 2010, p. 11). Smith, Löw, Bradley, and Lang (2006) also provide an example from their recent work that confirms such rapid affective responses. They found that heart rate and facial muscle activities correlate with pleasantness ratings on emotional valence, whereas skin conductance loads on emotional arousal during the viewing of unpleasant pictures.

Lang (1995) claims that emotions, which are products of a Darwinian development, could be regarded as motivationally modified states of willingness. And he has constructed a database of emotions “in three reactive systems: (a) expressive and evaluative language, (b) physiologic changes mediated by the somatic and autonomic systems, and (c) behavioral sequelae, such as patterns of avoidance or performance deficits” (Lang, 1995, p. 373).

Norman (2005) categorized three emotional processes:

- “Reactions: low-level processes such as affective signals and motor reactions;
- Routines: mid-level processing that involves memory to produce affect, emotion, or arousal
- Reflection: a high-level category that involves deliberation” (as cited in Lottridge, 2010, p. 10).

Knowledge about human emotions is hierarchically organized with the division of emotion valence between positivity and negativity, i.e., pleasant states such as happiness, love, and joy and unpleasant states such as anger, sadness and fear (Lang, 1995).
**Turner’s Taxonomy of Human Emotions**

*Table 1.1* below is Turner’s (2007) conceptualization of human emotions, presented as a taxonomy of different human emotions that vary by intensity. He categorizes four primary human emotions: happiness, fear, anger and sadness. “Primary emotions are those states of affective arousal that are presumed to be hard-wired in human neuroanatomy” (Turner, 2007, p. 2).

Although there is agreement on the basic properties of emotions, researchers have differed in terms of the number of emotions, five or more, that can be regarded as basic (Ekman, 1992). Tuner states that “[d]espite somewhat different labels, there is clear consensus that anger, fear, sadness, and happiness are primary; and indeed, humans probably inherited these not only from our primate ancestors but from all mammals as well. Disgust and surprise can be found on many lists, and we might consider these as primary as well” (Turner, 2007, p. 3).
<table>
<thead>
<tr>
<th>Primary Emotion</th>
<th>Low Intensity</th>
<th>Moderate Intensity</th>
<th>High Intensity</th>
</tr>
</thead>
<tbody>
<tr>
<td>satisfaction-happiness</td>
<td>content, sanguine, serenity, gratified</td>
<td>cheerful, buoyant, friendly, amiable, enjoyment</td>
<td>joy, bliss, rapture, jubilant, gaiety, elation, delight, thrilled, exhilarated</td>
</tr>
<tr>
<td>aversion-fear</td>
<td>concern, hesitant, reluctance, shyness</td>
<td>misgivings, trepidation, anxiety, scared, alarmed, unnerved, panic</td>
<td>terror, horror, high anxiety</td>
</tr>
<tr>
<td>assertion-anger</td>
<td>annoyed, agitated, irritated, vexed, perturbed, nettled, rankled, piqued</td>
<td>displeased, frustrated, belligerent, contentious, hostility, ire, animosity, offended, consternation</td>
<td>dislike, loathing, disgust, hate, despise, detest, hatred, seething, detest, furious, inflamed, incensed, Outrage</td>
</tr>
<tr>
<td>disappointment-sadness</td>
<td>discouraged, downcast, dispirited</td>
<td>dismayed, disheartened, glum, resigned, gloomy, woeful, pained, Dejected</td>
<td>sorrow, heartsick, despondent, anguished, crestfallen</td>
</tr>
</tbody>
</table>

*Table 1.1* Turner’s Taxonomy of Human Emotions (Turner, 2007, p. 7, Table 1.2 Variants of primary emotions)

As *Table 1.1* points out, “[h]umans have the capacity to arouse primary emotions at varying levels of intensity, from low- through medium- to high-intensity states. … With this wider range, it becomes possible to expand further the subtlety and complexity of emotional feelings and expressions which, in turn, increase the attunement of individuals to each other” (Turner, 2007, p. 3). He goes one step further creating new emotions by combining these primary emotions “just like mixing primary colors” (Turner, 2007, p. 3).

Turner (2007) claimed that combining two primary emotions creates emotions such as hope, relief, envy, or regret due to the natural selection in Darwinism to make sense. They “can
work to create tighter-knit social bonds. … [and] potentially forge social bonds and mitigate the dis-associative power in the negative emotions … [or they can break] social bonds and/or [violate] the moral order, thus turning a negative combination into an emotional response that has some potential for reestablishing the social order … [or] in ways that reduce the ‘negativity’ of each of the two emotions alone and, as a result, produce new emotions that are less volatile” (p. 9).

Turner (2007) even offered to create human emotions such as shame, guilt or alienation by combining all three negative primary emotions to “fully mitigate against the power of negative emotions to disrupt the social order” (p. 9). He believes that natural selection thus rewired human neuroanatomy (Turner, 2007).

1.4 Measuring/Enumeration of Emotion—Self-Reported Emotion Measurement

1.4.1 Definition of EC and Its Parity Reflected by EE and to EE

The collective state of emotional arousal produced in a classroom is defined as the Emotional Climate (EC) (Tobin et al., 2013). EC is produced when members of a group or organization develop an enhanced sense of collective identity and decreased sense of self. EC has been conceptualized in various ways in contexts including educational psychology, elementary and early childhood education, and, more recently, science education (Bellocchi et al., 2013). EC, however, is a structural reflection of emotions and social interactions in a situated environment that cannot be isolated from each individual’s EC since they are sharing social structures in-the-moment in the sense of proximity.
Durkheim (1912/1965) explicated associations of representations of social artifacts with emotions formed during certain events/interactions. Parallels occur in the classroom (as cited in Collins, 2004). Collins (2004) defined Emotional Energy (EE) as a special kind of energy that an individual acquires by participating in an inspiring ritual. According to Durkheim (1912/1965), social objects are etched with EE, which reflects the EC of particular events in a situated structure. He remarked that EE, the feelings a thing arouses in us, are subsumed spontaneously to the EC that represents EE, varies continuously throughout the situated structure, and the emotions aroused over again are transferred to the EC recursively (as cited in Tobin et al., 2013).

Whitall (1949) conceptualized student-student and teacher-student interactions by focusing on Social-Emotional Climate (SEC), which he characterized as a collective phenomenon in classrooms. “Whitall operationalized SEC by proposing that it influenced a) the ‘private world’ of an individual, b) the morale of the group, c) what meaning is attributed to group and individual activities, d) whether a problem is approached in an objective manner, and e) the interpersonal interactions within the group. In his work, priority was given to the teacher’s interactions with students and less focus was placed on student-student interactions” (as cited in Bellocchi et al., 2013, p. 3).

Emotions, EE, and EC, which are products of the microsocial processes of individuals in classrooms focused on student-student and teacher-student interactions, have valences and comprise the interactions that determine the strength of solidarity within collective groups in school settings. Positive EC is associated with collective expressions of happiness and joy experienced by individuals, while negative EC is associated with sadness, fear, or anger. Specifically, solidarity as a sense of group belonging and social integration between members of a group can emerge in association with positive or negative EC, and groups that exhibit more
solidarity are likely to produce more EE among their members and will likely to have greater bearing “on the level of everyday life situations” (Tobin et al., 2013, p. 72).

In my experiences as a teacher, once a student experiences a negative EE associated with events/interactions during class time, the negative EC reflected by such negative EE manifested in the student’s feelings. Furthermore, it can spread virus-like to the entire class such that, an individual or a group once is imbued with negative EC, such negative EC then saturates the entire classroom. For a teacher, detecting negative EE and avoiding permeation of negative EC in a classroom is salient because it consequently affects the process of mastering academic skills and acquiring new knowledge. Tobin et al. (2013) recounts that the research about learning environments has shown an association between EE and EC for both individuals and groups. They state that consciously intervening to change the EC of a situation is desirable when it has an effect on social classifications such as gender, race/ethnicity, skill, or native language proficiency, and it has been found to impinge on teaching and learning environments.

1.4.2 Measuring/Enumeration of Emotions in Psychophysiology and the “Clicker” in Education

Measuring Emotional Valence and Emotional Arousal in Psychophysiology

Lottridge (2010) has studied the usability of self-reporting devices (Figure 1.1) to measure emotions that entail physiological reactions. His research was about the human factors of human-computer-interaction-device design. He found that it is desirable to evaluate ergonomic product interface design by investigating all levels of technology users’ emotional
reactions. In Lottridge and Chignell’s (2009a) series of studies, they capture continuous, quantitative, affective self-reports using validating tools:

as a key complement to existing methods of evaluating human-product interaction … 

Human factors researchers and practitioners need a standard and well-accepted way to measure emotionality, to allow designers of emotion-relevant products and systems to listen to their users, and to improve their designs based on users’ emotional responses. …

The emotional reaction can arise into consciousness in some form, which the participants then must translate into a rating. The type of rating depends on the instrument; for example, a location on a slider or an angle on a dial, or an area on a surface. Then, participants’ ratings are analysed to find properties of the sample’s ratings, … reliability, mean rating scores and other characteristics (pp. 795-797).

Rating scales are used to report participants’ emotional experiences in given tasks such as how participants in psychophysiological emotion research rate their emotional experiences looking at a given picture. Self-reported rating scales measure subjective effects. For example, the NASA-TLX scale enumerates a mental workload assessment, and Likert scales enumerate participants’ extent of agreement, yet there is no conventional or well-known approach to characterize research participants’ emotional responses objectively despite an increasing focus on affective toolkits that measure participants’ associated emotions (Lottridge & Chignell, 2009b).

In the field of psychophysiology, there is a common practice of enumerating human emotion utilizing self-reported devices. They respond to pictures or video clips using a two-factor categorization according to affective emotion valence—is it positive (attraction/pleasure,
i.e., happiness, joy), or is it negative (aversion/displeasure, i.e., sadness, fear, anger)? —and degree of emotion arousal from calm to excited (Lang, 1995). Two-slider emotrace in Figure 1.1, below, for example, is a device that allows participants to express their scales of such emotion valence and emotion arousal at the same time. A Self-Assessment Manikin (SAM) Hardware Device (Figure 1.2) with culture free pictographs is another example of a toolkit for allowing research participants to administer their emotion ratings easily and quickly (Lang, 1995).

Figure 1.1 One and Two-slider emotrace, vertical version. (Lottridge, 2010)
Tobin et al. (2013) and Ritchie et al. (2011) studied about a new teacher in science classes. In their multi-method and multi-theoretical interdisciplinary study, Tobin et al. (2013) included nonverbal physiological dimensions to social events/interactions in a classroom through a self-reported Likert scale device nicknamed the electronic “clicker” (i.e. audience response devices; see Figure 1.3\(^1\)). It was employed to measure the EC of participants’ in-the-moment perception of their emotion during the science class. Research participants rated the emotional valence of their individual EC according to a subjective assessment of their perception of their emotion.

\(^1\) The official name of the model is ResponseCard RF LCD manufactured and sold by Turning Technologies LLC (https://www.turningtechnologies.com/response-solutions/responsecard-rf-lcd).
EC every three minutes throughout the entire research observation period. In my study, EC analyses are conducted using the same clicker device, and the research participants rate their emotions for every five minutes.

*Figure 1.3 Clicker: Self-Reported Emotion Valence Input Device*

### 1.4.3 Human Emotion Representations—Visualizations of Emotion Utilizing Models & Plots

The most popular representation of emotion assessment is the 2-Dimensional Emotion Model of Valence and Arousal in psychophysiology metrics. It reflects the two-factor organization of emotional valence and emotional arousal in psychophysiology in *Figure 1.4*. In
this 2-dimensional concept, the range of emotion valence is indicated by the horizontal axis and the range of emotion arousal is indicated by the vertical axis. The assessment engages a research participants’ perceptual task, and it organizes an analysis of human emotional reactions to suggestive pictures examples in the IAPS library (Lang, 1995)

Figure 1.4 2-Dimensional Emotion Model of Valence and Arousal in Psychophysiology

Metrics—Emotion Recognition from Brain Signals Using Hybrid Adaptive Filtering and Higher Order Crossings Analysis (Petrantonakis & Hadjileontiadis, p.82, Fig. 1)

The other popular visualization model for representing human emotions in psychophysiology is a circular model. It may or may not use vertical and horizontal axes. In Turner’s (2007) conception primary emotions are much like a portrayal of primary colors, which he calls an “emotion wheel.” His scheme of basic elements of primary emotions can mix emotions and produce new forms. The combination of a few primary emotions are portrayed in Plutchik’s emotion wheel model (Figure 1.5; Turner, 2007)
Bellocchi et al. (2013) and Tobin et al. (2013) use a line graph to represent the variability of the mean of emotional valence throughout an entire research observation period. Students entered their EC ratings during lessons by pressing a number on the clicker device mentioned earlier to, subjectively indicate the emotion valence of their individual EC in a Likert scale ranging from 5-Very Positive to 1-Very Negative. Ratings of 5 and 4 corresponded to positive EC valences, and ratings of 2 and 1 corresponded to negative EC valences. Mean EC valence values for the 3-minute time intervals were subsequently graphed to capture variations in EC for each time interval during the course of the lessons (Figure 1.6).
Since this is an event-oriented study, it is expected to show, either individually or collectively, the EC corresponding to the sequence of proceeding time for each three-minute time interval rating in the line-graph representation. Assuming their clicks meaningfully reflected their subjective assessment of the EC for each given three-minute period throughout the lesson (Tobin et al., 2013), the visualization of the EC is significant that the graph of the mean EC valence ratings provided a heuristic instrument for identifying salient classroom interactions in the video data by catching peaks and troughs. In Chapter 4, I present the methodology I adopted.
1.4.4 Issues/Limitations of Measuring/Assessing Emotions Utilizing Self-Reported Rating

Before discussing the issues and limitations that may occur during data collection and related analyses in human emotion research, we must acknowledge that there exists no device that measures emotions objectively. Therefore, utilizing survey or mechanical devices, and assuming participants accurately and honestly reflect their emotions, is the only methodology we can rely on to measure research participants’ emotions. Since there are no standard or conventional methods to measure emotions, reliable and valid methods of emotional measurement that can access affective responses as they occur are needed (Lottridge, 2010).

Self-reported devices or surveys for emotion research are relative and subjective. In addition, when such self-reported mechanical devices are utilized during the EC data collection process, it is impossible to know whether rating scales, at the moment devices are clicked, are a truthful correspondence of what participants really feel. Moreover, because there are concerns that participants may consciously be deceiving the ratings or unconsciously be hiding their emotions, and because they can give inaccurate evaluations of themselves, the reliability of psychological status self-reports is debatable (Troisi, 2002). Therefore, it is hard to validate individual subjective responses when self-report toolkits, which lack the ability to make important contextual information available, are employed (Tobin et al., 2013).

The challenge of designing education methodologies in emotion research is in providing other data collection methods, such as post-hoc interviews, that will support self-reported EC ratings. Berman, Brown, and Brooks (2002) “concluded that EC was still an underdeveloped area that would benefit from further investigation with new methods that redress the limitations of
available instruments, which lack the capacity to provide important contextual information” (as cited in Tobin et al., 2013, p. 73).

Participants’ behavioral characteristics are reflected in the expressiveness of the rating scales, which subjectively report their emotions that show different degrees of expressiveness. On the other hand, individual ratings may change over time and in response to environment, context, or stimuli in situated structures such as in school settings (Lottridge, 2010). It means that emotional responses are often reflected in each individual’s unique history and lived-experiences so that their emotion feedback is expected to be different but not judged right or wrong (Lottridge & Chignell, 2009a).

Bellocchi (2013) also questions the subjective feedback of research participants’ in-the-moment emotions that focus only on the parity of EC valence (i.e., positive or negative)—despite employing two-factor (i.e., valence and arousal) emotion research in psychophysiology. He contends there should be a concern with how participants rate their emotions in different class events/interactions and the importance of finding significance in the level of intensity in emotion valence (Bellocchi et al., 2013).

One other major obstacle in emotion research in classroom/school settings utilizing self-reported methodologies is that while some research participants rate their emotions diligently, others are overtasked and unable to click their devices or click them in a mechanical fashion because their main focus is the classroom/school setting (Bellocchi et al., 2013). When research participants encounter such situation, they may express emotion ratings with just one rating scale from the beginning of the task to the end of the observation period.

Lottridge and Chignell (2009a; 2010) also note that a limitation of emotion rating depends on the design of the self-reported instrument, which may affect rating inputs. Physical
movements representing emotions depend on the use of a slider, dial, or touchpad and their locations on the instrument. Studies have noted that the usability of self-reported devices during human-computer interaction differs across devices (Lottridge, 2010; Lottridge & Chignell, 2009a).

**An Issue from Related Emotion Research in Education—Overall Positive Rating**

Bellocchi et al. (2013) observed in their study that the majority appearance of positive class EC ratings is as “an unexpected result” (p. 24). And in the research of Tobin et al. (2013), they pointed out that EC valences were mostly positive overall.

In their studies about a new teacher in science classes, Tobin et al. (2013) speculated that accumulation of positive EE was supported by the fact that all participants willingly engaged in the project and shared throughout the event in high positive EE had possibly saturated the entire lesson with positive EE, which consequently reflected the overall positive EC valence rating during the entire lesson. Successful interactions associated with the activities occurred when the teacher and the students collaborated to produce dialogue and cultural fluency, both verbal and nonverbal (i.e., anticipatory, timely, and in an appropriate fashion). They shared a widespread synchrony or a positive emotional climate within the group and expressed collective effervescence through laughing, clapping, and choral responding. Consequently, such collective effervescence saturated throughout the entire science class period with positive EE (Tobin et al., 2013).

Another possible reason of overall positive EC valence rating, Tobin et al. (2013) speculated, was the surplus positive emotions associated with a couple of very high positive EC
segments at the beginning of the class. They affected the entire two-hour class period despite fluctuations of the mean EC valence.

In Chapter 3 in this dissertation, possible reasons of overall positive EC ratings Bellocchi et al. (2013) and Tobin et al. (2013) encountered will be extrapolated using EC data collected from the Brooklyn College study of a preservice/inservice science teacher education program.

1.5 Interaction Ritual Theory, EE and EC—Forging Social Bonds/Solidarity

One of the paramount theoretical frameworks in this dissertation is Collins’ (2004) theory of interaction ritual chains. The patterns and contradictions that occur in the Brooklyn College study reveal the association between class events/interactions and the research participants’ EC ratings. The associations are shown by the video/audio analyses that were recorded both during the observation periods in the classroom and during cogenerative dialogue (cogen) sessions. Cogen is a reflective conversation with dialogic inquiry that discusses what happened in class. It is a heuristic intervention method for improving the quality of teaching and learning. Cogen session data resources confirm EC data and show that students were able to ratify their feelings, thereby supporting our claims and hypotheses. (Ritchie et al., 2011)

According to Collins (2004), the central mechanism of interaction ritual theory operates in combinations of a high degree of intersubjectivity and a high degree of emotional entrainment. The results of that operation are feelings of group membership in which the emotional energy (EE) of individual participants creates confidence, passion, and aspiration through collectively appropriate rituals that in their appropriateness take on a moral urgency. Such moralities vary with the structure of the group, and even moralities change when group structure changes (Collins, 2004). “[R]itual is a mechanism of mutually focused emotion and attention producing a
momentarily shared reality, which thereby generates solidarity and symbols of group membership” (Collins, 2004, p. 7). “Durkheimian analysis provides not only a sociology of knowledge but a sociology of morals. This will lead us into the sociology of emotions capable of explaining the passions of righteousness, retribution, and rebellion, a sociology encompassing both anger and love” (Collins, 2004, p. 12). Violating moral codes, for example, provokes emotions of guilt, which are a combination of disappointment-sadness and fear (Turner, 2007).

Durkheim (1912/1965) analyzed a mechanism of interaction rituals in situated environments by describing religious rituals to show what social components come together in a structure and make a ritual succeed or fail. He proposed that religious ideas could be differentiated into group membership symbols that gather and carry out such religious rituals. Interaction ritual can convey collective effervescence, for example, as an emotional state in a moment, but the collective feeling remains for a longer period of time when the emotional state represents the group membership and EE of individuals (as cited in Collins, 2004). Thus, exploring the relationships between group contexts and mood may serve as a foundation for considering how groups alter cognitive activity and motivational tendencies (Park & Hinsz, 2006).

Information, new ideas, and new experiences are provided to members in small groups, and they extend an opportunity to increase productivity. The opportunity to improve efficiency assists members with achieving goals and tasks that could not be achieved by an individual working alone (Hinsz et al., 1997). Forsyth (1999) and Moreland (1987) assert that since groups assist the individual and shared goals and tasks of group members, and since group members have advantages over individuals, it seems natural for human beings to wish and look for such group membership and interaction within the groups (as cited in Park & Hinsz, 2006).
Durkheimian interaction ritual (IR) theory yields an unambiguous representation such that the formulation of social values and EE enliven individuals to produce emotions of group membership. And this representation is applicable not only to the collective interactions of religion and politics, but it also, according to Goffman (1956/1967), guides the social situations of everyday life (as cited in Collins, 2004). Goffman (1956/1967) expanded the Durkheimian idea of interaction rituals beyond their religious limitations into secular territory. He showed that interaction rituals play a significant role in affecting both individual personality and classifications of group restrictions in the sacred and profane worlds of everyday life (as cited in Collins, 2004). Complying with and maintaining unwritten rules that subsume moral codes creates a sense of security and solidarity among people in particular social structures, and conveys feelings of unity. Rules/traditions/customs are moral codes to deepen mutual feelings of solidarity, and strengthen their emotional ties. Coherence is the situation or social structure of sameness regarding cultural schemas, and difference or moments of incoherence, which are contradictions in social structures that transform the social structure or situated environment itself. Group memberships, after all, “promote the development and maintenance of meaningful interpersonal relationships by offering networks of support and mutual assistance” (Park & Hinsz, 2006, p. 137).

Collins (2004) says “the center of microsociological explanation is not the individual but the situation” (p. 3). A theory of interaction ritual and interaction ritual chains is above all a theory of situations. It is a theory of momentary encounters among human bodies charged with emotions and consciousness because they have gone through chains of previous encounters (Collins, 2004).
Every phenomenon, action, or reaction has meanings to connect to the sequential step to trigger a chain reaction in which original actions/reactions are already a part of a chain reaction. There is a Japanese proverb that says “When the wind blows, wooden bucket makers yield a profit” (*kaze-ga fukeba okeya-ga moukaru*). It means that trivial first motions may entail chain reactions and consequently induce unexpected results just like a Rube Goldberg machine or the butterfly effect. Collins’s (2004) interaction chains claim that individual interactions induce other actors’ enactments and subsequently propagate interactions (Tobin & Ritchie, 2012). They also alter emotional states in the self and among others. When emotions are produced by interacting with others in social structures, such emotions reflexively resonate, and new social interactions are reproduced within in the social structures. Locally established interactions create EE not only within the situated social structure, but they also can be carried over to other social structures and consequently create further interaction chains since individuals physically resonate such EE recharges in each subsequent encounter (Collins, 2004).

An individual is the interaction ritual chain itself, as such the individual is the establishment of social structure created by original interactions and a part of each new social structure disseminated subsequently (Collins, 2004). Therefore, the EC is not only expressed as a collective group of emotional agreements, but the EC is also expressed through each individual’s emotions since the individual’s EC in the Brooklyn College study, for instance, is affected by structures such as teachers/co-teachers, other participants, and the situated learning environment. Teachers and learners in classrooms all create social structure. Typically, teacher enactment makes teachers and learners dialectically connected, although teacher agency and learners’ passivity are likewise typical in classroom/school settings. Our interactional experiences constantly socialize us. Powerful interaction rituals generate influential EE, and such interaction
rituals should be internalized. IR theory is about social structures, which have their own rules and procedures (Collins, 2004). There is yet another Japanese proverb metaphorically expressing the iterations of individual interaction ritual chains, like the idea of reincarnation:

“Encountering someone is not an accident, but our fate from past lives” (sode suriaumo tashou-no en—(袖振り合うも多生の縁).)

Human beings create and interpret various emotional states, and emotions are used to build social bonds among them to create sociocultural structures, keep vows to those sociocultural structures, and tear them down. Increases in human arrays of emotionality strengthen social solidarity. On the other hand, the primary negative emotions anger, fear, and sadness work against augmenting group membership (Turner, 2007). “[S]ome groups have more resources for carrying out their rituals than others, so that some groups have more solidarity and thus can lord it over those who have less; and these ritually privileged groups have more impressive symbols and fill their members with more emotional energy” (Collins, 2004, p. 41).

Per Fagan (2008), early emotional processes that affect the reactions of approach or avoidance are presumed to be supported by subtler and intentional emotional reactions because of the pressure produced by more and more complex social interactions (as cited in Lottridge, 2010). “Accordingly, group membership and interaction should impact activation of group members’ approach and avoidance motivation systems. Thus, systematic group influences on mood, information processing, perceptions, attention, and behavior should be expected” (Park & Hinsz, 2006, p. 135). Alienation, which is an elaboration of disappointment-sadness, anger at a social structure, and fear about the consequences of not meeting expectations in this structure, for example, converts negative emotions into a withdrawal response and decreases willingness to participate in social structures (Turner, 2007). Social structures fluctuate. The dynamics of flux
always change and so does the EC of individuals and collective groups. They affect each other, repeatedly and hermeneutically.

Social structures at the macro- and micro-levels suffice to plot the continuation from local to inter-local networks and vice versa, showing that powerful interactive relationships have close connections. Therefore, an interaction ritual theory is crucial to microsociology, and microsociology is critical to much larger sociological ideas. It means that if we develop a sufficiently powerful theory on the micro-level, it will unlock some secrets of large-scale macrosociological changes as well (Collins, 2004). In a hermeneutic sense, it is similar to the topic of fractals in mathematics such that a shape or a part of a shape repeats in both smaller and larger scales. It means that if you see a pattern in a structure, you can find the same pattern in both smaller and larger scales of the structure.

1.6 Dissertation Overview & the Roadmap

In the chapters that follow, I employ different levels of analyses. In Chapter 3, macro-analyses are conducted utilizing the entire 13 weeks of EC data collection. In Chapters 4 and 5, meso/micro analyses are conducted using EC data collected in week #5. Collins (2004) stated that it will unlock some phenomena of large-scale macrosociological human interaction rituals as well, if we develop a sufficiently powerful theory of interaction rituals on the micro-level, and vice versa. I choose week #5 data resources because events occurred during the class in week #5 related to issues such as gender inequality and sexual orientation discrimination certainly caught my attention. Such events happened were unique with these particular research participants in those particular moments.
The multiple methodology I am applying in this thesis, including reflexive, interpretive, event-oriented, multi-level, and authentic inquiry, is what Bellocchi et al. (2013), Tobin & Ritchie (2012), and Ritchie et al. (2011) pioneered. They constructed their work through the visualization of EC data. I also examine, from a different point of view using the refined methodology, issues such as the overall positive rating of the EC valence, which Bellocchi et al. (2013) and Tobin et al. (2013) encountered.

The figure below is the dissertation roadmap.
Figure 1.7 Dissertation Roadmap
CHAPTER 2: RESEARCH DESIGN AND METHODOLOGY

In this chapter, I discuss the design of the post-hoc landscape analyses. I ground it on an interpretive multi-methodology and phenomenological study of human emotions in event-oriented social interaction rituals. The rituals are located within a preservice/inservice science teacher education classroom in the Brooklyn College (BC) Study. This thesis work adopts and reflects “a multi-method and multi-theoretic approach” (Tobin et al., 2013, p. 71) based on a polysemic methodology of video/audio recording file analysis and Emotional Climate (EC) data analysis. To identify and reflect upon individual and collective emotions, it uses a “sociocultural frameworks as a foundation for interpretive research, conversation analysis, and studies of variety of nonverbal conduct” (Tobin et al., 2013, p. 71) relevant to the use of microanalysis for video/audio recording. The phenomena of issues are explicated by interpretive inquiry (Erickson, 1986) through dialogic/conversation analyses and observation of body-movements corresponding to the self-reported EC input. During the process of analyses, I have adapted my research approach in the face of contingency and emergence proceeding hermeneutically.

2.1 Data Resources

2.1.1 The Brooklyn College Study

During fifteen weeks of a master’s level preservice/inservice science teacher education course at Brooklyn College of the City University of New York in Spring 2012 semester a research team led by Dr. Kenneth Tobin and Professor Konstantinos Alexakos, the course instructor conducted the Brooklyn College Study (BC study) to explore the relationships between
emotions, mindfulness, and social interactions within classroom/school settings at Brooklyn College of the City University of New York. The course, *History & Philosophy of Science Education*, was focused on an essential question, *What Is Science*. It employed open-ended class discussions and students/co-teacher presentations, through a sociocultural lens, about topics such as subject-oriented physics. The controversial topics were emotionally related to the learning environment: for example, eugenics, evolution and creationism, and gender/sexuality and inequality.

In the beginning of the semester, Professor Alexakos informed students that the purpose of the course was not only to fulfill coursework toward their degree but also for the research purposes of establishing methodologies in learning and instruction in science education classrooms. This research was administered by the Brooklyn College Institutional Review Board².

Employing polysemic methodology (Tobin et al., 2013) and executing analyses to forge authenticity criteria for improvement in learning and instruction in science education, the data resources collected in this BC study are affluent. First, the two-hour class sessions were video/audio recorded from multiple angles of the classroom every week throughout the semester to capture class events/interactions observing patterns/contradictions. Cogenerative dialogue (cogen) interviews/discussions held before and after each class were also video/audio recorded. Finger pulse oximeters were also provided alternatively to designated participants each week to collect physiological data such as blood oxygen saturation rate/level, heartbeat, and other changes in the body such as breathing characteristics.

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² CUNY, University Integrated IRB, Protocol: 291309
In addition to data resources provided by video/audio recordings, oximeters, and digital transcripts of cogen discussions, the aforementioned clicker, the device of paramount importance, was provided to all participants in the classroom to collect their self-reported responses about the emotional climate (EC). Participants could volunteer for breathing meditation sessions, and in particular weeks’ mindfulness/attentiveness surveys were included for heuristic purposes, i.e., a part of the BC study’s multi-method approach.

The main resources I utilized in this thesis were the EC data and video/audio recording files of class time activity. In addition, video/audio files of an after-class cogen meeting were employed as a complement data resource to endorse events that occurred during class time.

The preservice/inservice science teacher education course is a part of a 2-year Masters of Arts in science education program. Most of the students in the Spring 2012 semester class, had taken the prequel course in Fall 2011 semester with Professor Alexakos. Hence, almost all students and the instructor were somewhat familiar with their classmates.

### 2.1.2 Video/Audio Recordings

The weekly video-audio recording files collected throughout the semester were major data resources. In this post-hoc analysis, the video/audio recordings capture physiological characteristics such as head/body orientation, gestures, and verbal interactions in conversations. In focusing on participants’ conversations and physiological characteristics, I isolated the moment of contradictions that occur in the classroom. Such classroom contradictions were further analyzed them hermeneutically. I conducted the analysis considering the classroom interactions in conjunction with the EC data.
Theoretical Frameworks of Human Emotion Research, Engaging Video/Audio Analysis

Charles Darwin pioneered the study of the facial expression of emotion and found that certain facial expressions are universal across different cultures (Hager & Ekman, 1983). His research led to the idea that specific emotions can be generally classified by levels of emotional intensity (Lottridge, 2010). This is the theoretical framework of Lang’s (1995) study in psychophysiology that “resulted in a strong two-factor solution, with pleasantness ratings, heart rate, and facial muscles loading on one factor (valence) and arousal and interest ratings, viewing time, and skin conductance all loading highly on a second factor (arousal)” (p. 376). Lang’s research shows the complicated relationships of human emotion and physiological characteristics and how they are stimulated by social interactions.

William James (1950) theorized that a person’s physiological changes and arousal of emotions are the direct results of the perception of an exciting event. He argued against the idea that emotions cause one’s physiological modifications. His theory asserts that emotional changes and physiological changes occur simultaneously, stimulated by the interaction of events.

The BC study is designed to engage a polysemic methodology pursuing multi-theoretic and multi-level analyses. Research is strengthened by multiple meaning-making frameworks when the research participants have polysemantic-presenting opportunities (Tobin & Ritchie, 2012). Emotional climate data, 15 weeks of classroom video/audio recordings to capture physiological characteristics such as eye-gazing, body-movements and facial expressions, and measures of heart rate, oxygen saturation levels by fingertip oximeter were deployed to collect data as well.
2.1.3 Heuristic Intervention

Along with the rich data collected during the BC study, there were spontaneous heuristic interventions that took place during class time. “A heuristic fleshes out a social construct to reveal some of its characteristics and thereby affords the process of coming to know the construct in ways that facilitate reflection and catalyze changes relating to salient aspects of social life” (Tobin, 2013). In week #5, a heuristic intervention was conducted having how participants input their emotion ratings with a clicker. Heuristics has a characteristic of construction to aware full attachment to self and each characteristic and an invitation to make changes of such full attachment in ontological sense (Tobin, 2013). Dialogues/conversations during this heuristic intervention was worth to conduct analysis in which there are hints of occurrence of issues entailed by utilizing self-reported rating methodology to collect the EC data. In addition to point out that the clicker used in the BC study functions as a reflexive heuristic intervention instrument that allows participants to be aware of her emotional status at that particular moment.

Cogenerative Dialogue

In 1.4.4, I suggest exercising precaution when accessing participants’ emotions with the self-reported rating method. Participants’ EC input is absolutely relative and subjective. Therefore, it is recommended that when analyzing EC data, other data resources such as dialogic inquiry should be used to supplement interpretations of what is occurring in the classroom (K. Tobin, personal communication, April 24, 2014). We can find such dialogic inquiry in video/audio recording files of cogenerative dialogue (cogen) sessions.
A study of teaching and learning in a grade 7 science class in Queensland, Australia by Ritchie et al. (2011) focused on a new teacher who often experienced difficulty conducting classes. Although the researchers depended primarily on video/audio recordings to measure pitch, vocal intensity, and speech rate, post-lesson cogens played a large role for their study. In the BC study, cogen meetings were video/audio recorded and held before and after each class.

Cogenerative dialogue is marked by participants whose successive actions are in synchrony and proximity within a social group. In cogen, participants perform their reflexive dialogic interactions together so that participants have chances to utter, to be heard, and learn from each other (Tobin, 2013). Japanese Lesson study which is a well-known co-teaching style is a typical example of cogen.

The purpose of cogen is not to identify social truths and reach consensus on them, but to build understandings about others’ responses to questions … The primary goal of cogen is hermeneutic, making sense of others’ stances and the potential they have for improving individual and collective attainment. Convincing others about particular perspectives is not a goal. Instead, participants are encouraged to listen, learn, and in so doing, change ontologies (not to colonize others’ understandings hegemonically). As a result of participating in cogen individuals build an understanding of one another’s standpoints as they are represented in their answers to what is happening and why it is happening. Accordingly, participants can come to understand one another’s perspectives and values; that is, epistemologies, ontologies, and axiologies (Tobin, p. 24, 2013).
In the second part of Chapter 6, I use cogen session held in week #5 of the BC study to explore possible reasons for the flatliners found in the micro-analyses of the video/audio recordings associated with the EC data resources.

2.2 Measuring and Calculating Emotion

As I discussed in 1.4.4, despite scholars’ interests in human emotion research in various disciplines, there are limitations and issues of measuring emotions. Lottridge (2010) has claimed that as of yet there was no standard means of measuring emotionality. Reliable and valid methods are needed to assess research participants’ emotions as they occur. In neuroscience, there is the common methodology of measuring electrical brain activity during a research observation, but the use of surveys and mechanical devices to self-report emotions is more common for most academic disciplines. Brown and Brooks (2002) stated that “EC was still an underdeveloped area that would benefit from further investigation with new methods that redress the limitations of available instruments, which lack the capacity to provide important contextual information such as employee participation and job satisfaction” (as cited in Tobin et al., 2013, p. 73).

In the BC study, clickers were provided to the all research participants in the classroom to collect their self-reported emotion responses, the basis of the study’s emotional climate (EC) data. Research participants rated their moment-by-moment emotions through the entire lesson every week, reflecting what they subjectively felt in five-minute intervals. The five-point Likert scale was: 5-Very Positive; 4-Positive; 3-Neutral; 2-Negative; and 1-Very Negative.

EC data from the entire semester, week #2 to week #14, was used for quantitative macro-analyses, and EC data and video/audio recording files during week #5 were used for interpretive
meso/micro-analyses viewed through the framework of human emotions and social interaction
ritual theory. A big picture of the method designs of this post-hoc analysis will be discussed later
in this chapter.

2.2.1 Self-reported Emotion Measuring Tool *Clicker* Device Revisited

A clicker\(^3\) is a device used in the BC Study and relevant literature I reviewed for research
participants’ self-reported EC valence rating input (*Figure 1.3*). As I mentioned in the previous
section, the clicker functions as a reflexive heuristic intervention instrument that encourages
participants to think about their emotional status in the current structure. This is the same EC
rating input device used by Kenneth Tobin and Rey Llena at the Graduate Center and Lehman
College of the City University of New York, respectively and it’s been also used in numerous
Australian studies mainly involving Alberto Belloccchi (K. Tobin, personal communication,
January 25, 2016). This particular clicker originally was chosen by Dr. Kenneth Tobin because
of the products’ affordability and 200 foot Blue-Tooth transmission capability (K. Tobin,
personal communication, March 06, 2014\(^4\); http://www.turningtechnologies.com/response-
solutions/responsecard-rf-lcd; https://www.turningtechnologies.com/response-
solutions/responseware). The clicker “design immediately gathers real-time feedback from
participants” (https://www.turningtechnologies.com/response-solutions/responsecard-rf), and
“[t]he lightweight, rugged, durable ResponseCard has been rigorously tested in classroom

\(^3\) Cf. Footnote 4 in Chapter 1, 1.4.2

\(^4\) “Is the "clicker" device you used in the research in Australia exactly the same as you used in the Brooklyn study?”
“Yes, it is the same clicker; same brand even.” (K. Tobin, Thursday, March 06, 2014 3:04 PM)
Lottridge and Chignell (2009a) claimed in their series of research studies that using validating tools to capture continuous, quantitative, affective self-reported emotions was key to current methods of assessing their study of human-computer interaction. “User interface and product design requires satisfactory methods for evaluating and comparing emotional experiences. In order to be widely used by designers, researchers, usability engineers and ergonomists, measures of users’ emotional responses need to be standardized, and need to be relatively lightweight and easily usable” (Lottridge, 2010, p. 3). “The emotional reaction can arise into consciousness in some form, which the participants then must translate into a rating. The type of rating depends on the instrument; for example, a location on a slider or an angle on a dial, or an area on a surface.” (Lottridge & Chignell, 2009a, pp. 796-797). The design of the instrument affects the participant in terms of the physical movement necessary to change the status, and whether it is a number or a position affects the conceptual form of the rating (Lottridge, 2010).

Lottridge (2010) used sliders and touchscreen devices in his studies and said that “[r]ecent work has proposed sliders as a useful way to measure self-reported emotion continuously” (p. ii). In a re-rating task, the slider models were found to be more reliable than touchscreens (Lottridge, 2010). Although Lottridge’s research about human-computer interaction in psychophysiology uses a different methodology than emotion research in the BC study, we have much to learn about the self-reported emotion rating devices. The self-reported tool used in the BC study, the clicker “is designed so that participants receive visual confirmation of input. The LCD screen displays response selected, channel setting and battery life” (http://www.turningtechnologies.com/response-solutions/responsecard-rf-lcd). The LCD function assures participants of inputs thereby minimizing input mistakes. In this study however,
the physical interface of the clicker might not falsely affect the ratings. The design of the clicker is most likely irrelevant to the results of this research.

2.2.2 Decision Making Process of Emotion Ratings

One’s emotion in a period of time is continuous. The challenge of enumerating emotions, however, is how to measure, and what is the appropriate scale of measurement for recording such continuous emotions. Considering Turner’s (2007) category of primary emotions such as happiness, fear, anger and sadness, it is challenging to properly record emotional valence in a continuous manner since measuring emotions solely and inevitably depends on self-reported systems.

The challenge of designing the methodology of this emotion research using the clicker is how to reflect self-reported emotions, which are subjective, i.e., how to analyze individual or collective EC valences with such devices when choosing the rating scale is entirely subjective. Customary usage of how research participants express their rating scale owes to behavioral characteristics regarding how people subjectively echo their emotions. That is, different degrees of expressiveness can be exhibited with varying capacities that also may change over time and depend on each individual. Expressiveness differs as well according to stimuli, environment and context (Lottridge & Chignell, 2009b). The fundamental problem of emotion research, however, is that there are no tools to measure emotion. Therefore, relying on the self-reported data is inevitable. Bellocchi’s (2013) argument of considering emotional intensity an EC range might still present limitations. For research to proceed it is important to have a consensus or make use
of a rubric to assure all research participants that they can rate their emotions and research teams can properly interpret scale ratings.

Related to this argument about requiring EC ratings consensus were issues brought up by the BC Study principal investigators about positive ratings defined in section 1.4.4. The principal investigators proposed an intervention to understand the meaning of the Likert scale EC ratings and the instruction of inputting the EC.

What we must keep in mind about using the EC data is that the data are subjective evaluations. We asked the BC study participants about “their “emotion[s] in the last 5 minutes.” Participants could be rating their feelings toward something completely unrelated to events occurring during the research observations.

2.3 Research Design of the Landscape: Event-Oriented Interpretive Analyses

Dilthey (1914/1976b) argued that the methods of the human sciences should be *hermeneutical*, or interpretive, when the discourse of a speaker or writer is translated with the purpose of discovering and communicating the meaning-perspectives of the participants (as cited in Erickson, 1986, p. 123). This research, which is influenced by Dilthey’s dicta, is a landscape study on human emotions using Turner’s (2007) *Theory of Emotions* and Collins’ (2004) interaction ritual theory as its main theoretical frameworks. I take Tobin’s (2013) advice into account and avoid elaborating, in a single chapter, a formal and strict methodology. Instead, methods designed for each analysis are thoroughly explicated in the beginning of each chapter, and anything relevant to each of three main analyses such as method designs and results are contained in those chapters (Tobin, 2013).
EC analysis is the primary data analysis used throughout this dissertation. The EC valence data were collected by distributing clicker devices for each research participant during the observation periods in the aforementioned Brooklyn College (BC) study. One of the challenging tasks of this event-oriented study on human emotions is how to design different approaches that will unlock the phenomena of human social interactions in school/classroom settings. I employ a continuous flux of self-reported EC data and video/audio recording files of dialogues/conversations analyses. I treat those visuals, audios, and participant utterances as emotional input and execute the analyses through accurate observation of patterns/contradictions occurring in school/classroom models in this event-oriented study. Guba & Lincoln (1989) state that to reach reliable conclusions such methods are critical. Whether researchers accomplish their purpose or not, however, the effort cannot be assured by relying on methods alone. A method is just one deliberation in the constructivist paradigm. It is parallel to an outcome, product, or negotiation in judging a given inquiry. In this chapter, I briefly describe, how I plan to elucidate the research questions what is happening \textit{HERE} and why is \textit{it} happening \textit{HERE}. In addition to utilizing the self-reported EC data resources and video/audio recording files, I conduct a reflexive inquiry of cogen following each observation period. I also conduct an analysis of the aforementioned heuristic intervention, which is video recorded. The intervention has a complementary role that elucidates the patterns/contradictions of research questions above.

The EC data and video/audio recording files are used as the main data resources to pinpoint contradictions occurring in the classroom. Discovering why those contradictions can occur by analyzing the EC data followed by video/audio analyses. Video/audio recordings can also support EC analyses with other resources such as cogen and interviews to explicate event-oriented phenomena of human emotions and interaction rituals in classroom/school settings.
Because EC data resources are self-reports, it is important to employ video/audio recordings to identify physiological evidence such as body movement, facial expression, or eye gaze. They function as non-verbal communications and add to narratives and discussions. Video/audio recording files also discern different degrees of coherences, which may reveal useful characteristics of different interactions (Lottridge, 2010). The methodology I apply here permits me to compute the different degrees of coherence. Therefore, we can use video/audio analysis to measure the interactions that occurred in the classroom. And quantified EC data can be objectively analyzed.

I must note that the times indicated in square brackets throughout this dissertation are not actual Eastern Time, but computed class elapsed time so that [1:01’01”] means 1 hour 1 minute 1 second into the class. I also note that the research participants of the BC study are identified by their “pseudonyms to protect participants’ privacy and confidentiality” (Kannan & Miller, 2009, p. 145).
CHAPTER 3: Likert Scale Rating Count for 13 Weeks of EC Data

In this chapter, I report on a macro statistics analysis of the emotional climate (EC) data of the BC study for the entire 13 weeks, from week #2 to #14. The issues that inevitably occur when a self-reported rating system is utilized in emotion research are explicated. Such phenomena then are interpreted through a dialogic/conversation analysis of the discussion that took place in the classroom during a heuristic intervention. Heuristics have a unique characteristic of constructing a mindfulness that is aware of its full attachment to the self and each characteristic of the self, and are an invitation to make changes to that full attachment in an ontological sense (Tobin, 2013). The reflexivity aspect of cogenerative dialogue (cogen) sessions takes place to insure that every participant understands the given Likert scale ratings. The sessions seek a consensus on the meaning of self-reported EC ratings.

The heuristic intervention of EC ratings held in week #5 is an important basis of this dissertation since the intervention has a complementary role that elucidates the patterns/contradictions of research questions, and readers will find the research participants’ opinions and insights concerning research methodology of EC data collection throughout the following chapters.

3.1 Method Design of Macro Statistics Analysis Associated with Dialogic/Conversation Analysis

As described in Chapter 2, individual participant’s EC data from week #2 to #14 were collected by utilizing the clicker. In this chapter, the total frequency of each Likert scale rating for the entire 13 weeks of the raw EC data is tallied and analyzed. I report the mean of the EC
valence ratings for each week and exhibit results in a variability graph. Then I discuss the results of the macro statistics analysis and offer quantitative analyses to account for self-reported data.

The informative EC rating heuristic intervention/discussion for the given Likert scales of EC ratings took place during class time in week #5 to reassure that the EC scale ratings and the meaning of the rating scales reflected the participants’ emotions toward classroom events. Participants offered thoughts about EC ratings and how they rate their emotions during this intervention. Through the dialogic/conversation analysis of the EC intervention, the preference of positive ratings over negative ratings was interpreted within a framework of approach and avoidance.

### 3.2 Results—Tallying the Rating Frequency for 13 Weeks of EC data

Table 3.1 below represents the frequency and total tallies of each ratings of 5-Likert scales from week #2 to week #14 of the participant-entered EC valence data. The ratings correspond: 5-Very Positive; 4-Positive; 3-Neutral; 2-Negative; and 1-Very Negative (Tobin et al., 2013). In addition, the means of the EC ratings for each week were calculated. A bar-graph in Figure 3.1 and a pie-chart in Figure 3.2 made tallies of ratings, total frequencies and proportions visual.
<table>
<thead>
<tr>
<th>Rating</th>
<th>Week 02</th>
<th>Week 03</th>
<th>Week 04</th>
<th>Week 05</th>
<th>Week 06</th>
<th>Week 07</th>
<th>Week 08</th>
<th>Week 09</th>
<th>Week 10</th>
<th>Week 11</th>
<th>Week 12</th>
<th>Week 13</th>
<th>Week 14</th>
<th>TOTAL</th>
<th>Mean</th>
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<td>10</td>
<td>2</td>
<td>5</td>
<td>9</td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>10</td>
<td>2</td>
<td>1</td>
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<tr>
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<td>13</td>
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<td>71</td>
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<td>41</td>
<td>18</td>
<td>34</td>
<td>21</td>
<td>52</td>
<td>22</td>
<td>11</td>
<td>441</td>
<td>3.45</td>
</tr>
<tr>
<td>3</td>
<td>187</td>
<td>232</td>
<td>221</td>
<td>243</td>
<td>322</td>
<td>265</td>
<td>264</td>
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<td>20</td>
<td>25</td>
<td>25</td>
<td>519</td>
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<td>475</td>
<td>595</td>
<td>622</td>
<td>498</td>
<td>551</td>
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<td>553</td>
<td>499</td>
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<td></td>
</tr>
</tbody>
</table>

*Table 3.1* Tally of Frequency of Each Likert Scale Ratings for the Entire 13 Weeks of the EC data

![Bar chart](https://via.placeholder.com/150)

*Figure 3.1* Total Frequency of Each Likert Scale Ratings for the Entire 13 weeks of the EC Data
The bar-graph of Figure 3.1 above shows the Likert scale rating of 3-Neutral has the highest total frequency of ratings, then the Positive emotion inputs of 4 and 5 are next in rank, and then the Negative emotion inputs of 1 and 2 follow. So here, we see the rank of ratings from the highest frequency to the lowest frequency is 3 → 4 → 5 → 2 → 1 for the entire 13 weeks of participants self-reported entries of the EC ratings in the Figure 3.1 bar-graph. Moreover, by observing the pie-chart of Figure 3.2, we can find that the sum of positive ratings of 4 and 5 is 40.28%, and the ratings of 3 and above, that is, Neutral and Positive ratings represent 92.48% of total entries for the 13 weeks of EC data.

This phenomenon of preference of positive ratings over negative ratings is also described in the mean EC valence variability for each week from 2 to 14 as expressed with a line-graph in

Figure 3.2 Proportion of Each Likert Scale Ratings for the Entire 13 weeks of the EC Data
Figure 3.3 below. The graph shows that the mean valences of the EC ratings in each week always exceed the *Neutral* rating of the Likert scale of 3.

![Mean Valence Variability](image)

*Figure 3.3 Mean Valence Variability for the Entire 13 weeks of the EC Data*

Both graphs of total tallies for each rating and mean EC valence variability for 13 weeks indicate that self-reported *Positive/Neutral* ratings of the 5-item Likert scale were more common than *Negative* ratings. The overall positive ratings were also found by Bellocchi et al. (2013) and Tobin et al. (2013). The finding is supposedly inevitably the results of the self-reported rating methods of their studies. Similar results occur in education and psychophysiology (e.g., Lotridge, 2010).

The phenomenon of *overall positive ratings* is because of utilizing self-reported rating method with a mechanical device or a survey an accurate reflection of the Emotional Energy (EE) environment. The appearance of overall positive ratings results can be interpreted by other analyses.
3.3 Analysis & Discussion—Overall Positive Rating of EC Valence

3.3.1 Interpretation of the Overall Positive Rating Phenomenon in Relevant Literature

In Tobin et al. (2013), the authors pointed out overall positive clicker ratings in their study of classroom observations. And Bellocchi et al. (2013) stated that the majority appearance of positive class EC ratings was “an unexpected result” (p. 24).

Tobin et al. (2013) speculated that overall positive EC valence ratings resulted from participants sharing accumulated high positive EE, which was supported by the carnival (Bakhtin, 1988)-like classroom atmosphere and thus resulted from an overall positive EC valence rating of the classroom learning environment. Successful interactions in classrooms associated with class activities occur when a teacher and students collaborate to produce dialogic interactions and cultural fluency in appropriate fashion, when they share widespread synchrony/entrainment of a positive group EC or when they express collective effervescence in a carnival-like atmosphere uttered as laughing, clapping, or choral responding (Tobin et al., 2013). In their study, Bellocchi et al. (2013) agreed that particularly short duration events that entail high positive emotional intensity can saturate an entire lesson with positive EE, which overshadows even noteworthy negative emotion moments so that it produces an overall positive class EC results.

Tallying 1st Click for the Entire 13 Weeks of EC data

Tobin et al. (2013) speculated that another reason for overall positive EC valence ratings in the mean of an entire lesson was that surplus positive emotions associated with a couple of
exceptionally high positive EC segments in the beginning of class time affected the entire two-hour lesson. I collected macro-statistics of the frequency of each rating scale for each research participant’s very first EC input for the entire 13 weeks to investigate the hypothesis that excess positive emotions are associated with segments at the beginning of each class (Tobin et al. 2013). Note that this is a tally of ratings of the first input entered by only those research participants who were present at the start of each class for the entire 13 weeks. It does not include every participant’s first click. Some students came late for class and were not in the tally. It is possible that late participant first entries would skew the results and should be avoided.

Figure 3.4 Total Frequency of Each Rating for the 1st Ratings of the EC Data for the Entire 13 Weeks
The bar-graph, *Figure 3.4*, above is the total frequency of each Likert scale rating for the 1st ratings of the EC data for the entire 13 weeks, and *Figure 3.5* is the proportion of each rating for the 1st ratings for the entire 13 weeks expressed in a pie-chart. As we see in *Figure 3.5*, the chart shows that the neutral rating 3 is the highest tally at 42.45%, the next most frequent rating, 4, is 37.26%, and the order of rating frequency in *Figure 3.4* shows that the order of the 1st rating frequency is the same order as in *Figure 3.1*, from highest to lowest: 3 → 4 → 5 → 2 → 1.

In the pie-chart in *Figure 3.5*, although the ratings of 3 and above, *Neutral* and *Positive* ratings, are similar to the total entries (91%), positive ratings of 4 and 5 for first clicks represent 49.06% of total beginning-of-class first rating entries. These first entries compare to 40% of total entries of 4 and 5. They even surpass the ratio of *neutral* ratings. Therefore, this analysis of the very first
entries of the EC data for the 13 weeks endorse the claim of Tobin et al. (2013) that a high positive EC occurs at the beginning of class time.

It is hard to imagine that events for participants in classroom/school settings are negative immediately at the beginning of class, especially in classrooms held in teacher preparation graduate programs like the BC study.

I would also like to point out that the mean EC valence becomes statistically higher in the beginning of each classroom where tardiness lowers the sample numbers. For various reasons, a high positive EC may occur at the beginning of a class. Consequently, the mean EC of an entire period will register as overly positive. Negative EC ratings at the beginning of the class, however, were still observed in the BC study, possibly due to a negative EE associated with lived-experiences from outside of the observation periods. I will discuss this case of the outside-of-the-classroom influence in the next chapter.

3.4 Emotional Climate Rating in Heuristic Interventions

3.4.1 Meanings of Emotional Climate Rating Scales—Heuristic Intervention

An informative EC rating heuristic intervention discussion took place during class time in week #5 in the BC study. It was comprised of a reflexive inquiry of a cogenerative dialogue (cogen), and its purpose was to assess the self-reported EC scale ratings which unduly influenced overall positive ratings.

Heuristics have a unique characteristic of constructing a mindfulness that is aware of its full attachment to the self and each characteristic of the self, and are an invitation to make
changes to that full attachment in an ontological sense (Tobin, 2013). Conducting a
dialogic/conversation analysis about EC revealed significant comments/opinions and
thoughts/insights about the EC ratings by the research participants, and the analysis verified the
preference of positive ratings over negative ratings. The intervention in week #5 made salient the
issues that are inevitable when self-reported devices are utilized in emotion research.

After the class instructor and one of the principle investigators of the BC study, Professor
Konstantinos proposed to his students/research participants discussing the meaning of the EC
Likert scale for clicker responses, the co-principle investigator of the BC Study, Dr. Kenneth
Tobin brought up issues of the overall positive ratings. And, they sought a consensus on self-
reported rating scales. Because this thesis relies on the EC analysis as its primary investigation,
though triangulated by the other analyses, this EC rating intervention has deep meanings that is
relevant for interpreting other phenomena in this event-oriented study.

The discussion of the EC rating scale was proposed during week #5 because Dr. Tobin
pointed out, “there were some problems” with the EC analyses conducted by the research team
for the previous weeks. One of the issues Dr. Tobin pointed out was that the computed collective
EC was “always somewhat positive.” The BC research team decided to hold the EC rating
intervention during class time, and discussing how the research participants were thinking about
the EC ratings. Dr. Tobin initiated the intervention as follows:

I think really critical thing you can just talk about is that when you click, it should be
what is MY experience with the Emotional Climate in the last 5 minutes, … it's not that
you're saying what does the class think the Emotional Climate is, it is what do I think,
and so I thought I made that clear because we have a few problems that I am sure that I
have talked to you about. … it is always somewhat positive and we can find out those by asking you (the overall positive rating issue), but I thought you might want of talk about that a little bit about what criteria factor into a 5, 4, 3, 2, 1.

Dr. Tobin stated that the research participants must be careful about using these EC data for analysis because of their subjective nature. It means that participants were asked to rate their emotions in the last 5 minutes, i.e., within 5 minute intervals. But the ratings might not have been limited to emotional states such as happy, angry, fear, and sadness. There was non-verbal clicking that occurred in the classroom events/interactions at particular instants (Davidson & Begley, 2012). He emphasized that for participants the clicker utilization was not an objective observation of an emotion at the precise time of the clicking. Hence, research participants were asked to shift their ontological authenticity stance (Guba & Lincoln, 1989) by noticing how they rated their emotion in previous weeks. This reflexivity evoked an added awareness in participants who still were not 100% sure about how to execute this new methodology. The participants could contribute to the future of learning and teaching by discerning the imperative purposes and procedures of the research, and consequently they could produce more productive EC analyses by enhancing their practice during the times in which they reflected upon the ratings.

A team of expert observers in the study by Bellocchi et al. (2013) found that it is not clear how participants perceive EC of classes during different types of class interactions. According to the dialogic/conversation analysis, evaluation of the clicking process was often a direct and simple reflection of events/interactions occurring in the classrooms. For example, a research
participant, Zachareeya mentioned during the intervention that “I hit 2 all the time during group presentation because the movie (a video-clip selected by presenters) made me feel sad.”

Another participant, Laura, noted her rating process was sometimes influenced by how much she felt interested in and connected to different types of class interactions. Laura said, “whenever I choose 5 or 4, sometimes it’s because it really interests me and I’m like sometimes when I click 2; it’s like, oh this is not interesting to me; it just changes my entire mood.” This means that, in a case like Laura’s, a student would pick a rating of 5 if the class interactions had been interesting enough to make her attentive, even if she experienced negative emotions such as sadness, fear, or anger. Her comment clarifies that the rating scales of their EC were not only affected by the events/interactions themselves including video-clips or one’s narratives, but ratings also depend on participants’ interests or moods dissociated from their emotions toward the particular class events/interactions.

The paramount important thing we have to keep in our mind regarding self-reported subjective ratings is that “how one experiences (their EC rating) is a very personal thing, and each of you can be a little bit different” as Dr. Tobin stated during the intervention. “How you rate EC is not what you think the class collective EC is, but how you [the individual] feel,” he emphasized to say. One of the issues Tobin pointed out during the intervention was that the collective EC is always somewhat positive as the results of the macro-statistics analysis. Dr. Tobin inquired of the research participants:

There are three negative emotions, right? Sadness, anger, and fear, so they will take the curve down. And so, it’s not bad to be negative or it’s not good to be positive. It’s just
what it is. And so you know I think it has to be contextualized. So, don't be afraid to go down if somebody said something that actually makes you sad. Then it’s OK to be profoundly sad for 5 minutes or profoundly happy for 5 minutes.

Accordingly, Dr. Tobin wanted to make sure that research participants would enter their precise emotions at the moment of the click, every 5 minutes. Replying to Dr. Tobin’s statement, a research participant, Zofia, confirmed that she was unwilling to press negative ratings. She always felt bad inputting negative ratings such as 2, and she sounded relieved to say that “it’s really nice that you [Dr. Tobin] said that it’s OK to be with 2.” Her comment would be an indication that the overall rating with self-reported system utilization is positive because human beings simply prefer a positive response, as a form of approach and avoidance. It is a matter of their human nature, just as Dr. Tobin predicted.

**Behavioral Activation/Approach System (BAS) and Behavioral Inhibition/Avoidance System (BIS)**

Lottridge and Chignell (2009b) argued that ratings depend on the shapes and the positions of the curser, dials, or buttons of self-report devices. They found more positive than negative ratings when participants translated their emotional arousals from reactions to consciousness and then into a rating. The extent to which the physical appearance or ergonomic design of the devices utilized in the BC study contributed to participant ratings is beyond the scope of this study. However, Lottridge and Chignell (2009b) found that people’s preference for positive ratings was even deeply associated with the location of dials or buttons of such self-reported devices. Laurens and Desmet’s (2008) investigation into the directionality of the slider
scales and the speed of self-report concluded that research participants responded more quickly when positive entries were placed at the top of the scale and the negative edge was placed at the bottom of the slider scales. They found it related to the physiological expression of approach and avoidance theory, that is, it is natural to physically and almost subconsciously approach keys/buttons as if the scale the participants see on them is positive. Stimuli interpreted as negative cause a withdraw bias on the other hand (as cited in Lottridge, 2010). This means that human beings naturally prefer positive entries. Negative indications of stimuli/events cause participants to hesitate when translating their movements into negative ratings. Such a physiological manifestation of approach and avoidance is determined by two primary motive systems, the appetitive system, which is characteristically expressed by a behavioral approach and the aversive system, which is expressed by behavioral avoidance (Lang, 1995). The aversive system is activated when unpleasant events/interactions are observed, but research participants try to avoid accurate negative rating entries with self-reported devices because positive activation is voluntarily prompted through acts of doing rather than acts of thinking. Moreover, group interaction increases self-reported measures of positive activation, and approach tendencies become higher during group interactions rather than when individuals work alone (Park & Hinsz, 2006).

3.4.2 Theory of Approach and Avoidance Phenomenon—Preference of Positive Ratings

Bellocchi et al. (2013) stated that overall positive rating results in their study were “an unexpected result.” Sequential collective EC ratings remained positive in their study. However,
considering the nature of the behavioral approach and aversive system, overall positive ratings were not a surprising phenomenon. They could be logically explained because of human nature.

Gray (1972) explained that the behavioral activation/approach system (BAS) rewards goal-oriented behavior and mainly motivates goal attainment or potential rewards by initiating behavior in response to positive outcomes. In the BAS, a person becomes active in situations in which the potential of rewards drives the person towards circumstances that possibly lead to pleasure and positive consequences. The behavioral inhibition/avoidance system (BIS) occurs when an organism activates responses that avoid negative outcomes (as cited in Park & Hinsz, 2006). The approach and avoidance systems can lead to particular emotions with positive or negative valence that result from the BAS, which is responsible for positive emotions, or the BIS, which leads to negative emotions in approach and avoidance situations. Whether emotions are positive or negative depends on the efficiency of a person’s reactions being employed to achieve a goal rather than assuming a simple emotion valence relationship between the efficacy of the person’s reactions and BIS/BAS (Carver, 2004).

Moreover, group membership and interaction inevitably influence the activation of group members’ BAS and BIS, which may supplement existing knowledge about the nature of groups. BAS and BIS function as an integrative framework that explains various effects. And such a framework likely relates to the group influences of motivational and affective inclinations. Therefore, such a regulatory group influences mood/emotion, efficacy beliefs, risk perceptions, and behaviors that lead group interaction to increase. BAS activity for group members should be expected and enhanced among those members. Belonging to groups can offer members the perception of safety and reduce threat perceptions. BIS activity, on the other hand, should decrease when one is working on a task alone. Groups and group members should be more
approach-oriented and risk-seeking than individuals working on the same task alone (Park & Hinsz, 2006). Group membership makes members feel protected from evaluative intimidations when output results from consensus, are indivisible, and member inputs are unidentifiable. Therefore, criticism and punishment are less intimidating compared to outcomes coming from individual working alone (Park & Hinsz, 2006). In the BC study, the self-reported rating system is not anonymous—who clicked what is disclosed afterward by the setting, but it is not known what ratings the other participants clicked.
CHAPTER 4: MEASURES OF EMOTIONAL AGREEMENT OF COLLECTIVE EMOTIONAL CLIMATE

4.1 Meso/Micro-Analyses Method Design—Collective EC Data as a Likeness Indicator

Following the new method design approach of using changes in mean EC valence to manage EC data analyses for overall positive ratings, I continue “using the EC data heuristically to identify class events from video data rather than taking the EC ratings to be direct measures of the class EC” (Bellocchi et al., 2013, p. 30).

In this chapter, analyses that originated in recent event-oriented studies in schools/classrooms settings by Bellocchi et al. (2013) use self-reported EC data resources that are elaborated and visualized. The “methodology of event-oriented social research employs video ethnography, narrative, conversation analysis, prosody analysis, and facial expression analysis” (Tobin & Ritchie, p. 117, 2012). “Like other constructs in event-oriented social research, the timescale associated with EC can vary depending on focus” (Tobin & Ritchie, p. 120, 2012). By employing both the traditional mean EC valence plot and reified means of change in EC valence plot of week #5 as the guidepost for describing the entire observation period we can view the EC graphs to identify salient events/interactions in the classroom (Tobin et al., 2013). We can then subject those events to a video/audio meso-analysis. Then, the echo of participants’ subjective emotions in the EC data resources are acknowledged through micro-interpretive analyses of the research participants’ actions/reactions and a dialogic/conversation analysis is performed on their speeches and discussions through video/audio file recordings.
4.1.1 Traditional and New Approaches in Relevant Literature

*Traditional Application of the EC Data—Agreement of EC Valence*

In literature related to this study, Bellocchi et al. (2013) and Tobin et al. (2013) used a line graph to represent the variability of the mean of EC valence, which also serves as a heuristic for describing activity throughout an entire class period (Tobin et al., 2013). Research participants entered subjective EC ratings periodically during lessons by pressing a number on an EC input clicker to indicate perceptions of their EC in a 5-level Likert scale. Ratings of 5 and 4 are identified as positive emotions, and ratings of 1 and 2 are identified as negative emotions.

In this study, the clicker was used to identify each participant’s self-reported EC data on a five-part Likert scale: 5-Very Positive; 4-Positive; 3-Neutral; 2-Negative; 1-Very Negative. Participants entered data rating their emotions in 5-minute intervals. *Figure 4.1* below is the subsequent time plot line-graph of the mean EC valence representation for week #5 of the BC study. It is plotted using the traditional emotion studies approach for school/classroom settings (e.g., Bellocchi et al. (2013); Tobin et al. (2013); Ritchie et al. (2011)) to capture variability of collective EC valence for each 5-minute time sequence throughout the entire lesson for week #5 of the BC study to identify salient events/interactions and patterns/contradictions in the classroom by video/audio analysis.
Tobin et al. (2013) apply the mean EC valence plot as a heuristic for analyzing each of the noticeable events occurring in the school/classroom setting via video-analysis. Doing so allows the identification of such events within particular intervals. After each interval of the mean EC valence graph was extracted, then microanalyses of conversation, prosody and other non-verbal analyses could be conducted polysemically by focusing on the identified events to analyze patterns and contradictions within and across such events (Tobin et al., 2013). Notifiable peaks and troughs from the mean EC valence graph pinpoint transformative events (Sewell, 2005) with this methodology. I, too, utilize such a continuum EC valence plot as an effective measurable instrument to execute video/audio analyses from a phenomenological point of view. It means that accurate depictions of patterns/contradictions in schools/classrooms and in co-
teaching in this event-oriented study are the key to explicating sociocultural classroom phenomena.

The plot of the mean EC valence signifies the moments of collective EC even if it is not complete agreement of EC ratings of the entire class EC (Bellocchi et al., 2013). The method of graphing the mean EC valence is the best way to articulate collective EC valence reflecting the class EE representing synchrony/entrainment in the classroom contributes for arousal of positive EE and collective effervescence in the learning environment (Tobin et al., 2013). This means that majority of research participants agree emotionally, either positively or negatively, to corresponding transformative events that occur in the sharing sociocultural structures. Emotional Majority Agreement (EMA) is a psychometric property characterized by a degree of affective agreement that appears as responses to stimuli or interactions recorded by self-reported instruments. The scores describe the extent to which collective participants agree on emotional responses. EMA is a useful measure of the degree of emotional similarity within a group and can be used to qualify and differentiate between how individuals react to different affective stimuli within a group. It can be applied to individuals, stimuli and input methods. (Lottridge, 2010; Lottridge & Chignell, 2009a)

**A New Approach—Ranges of Positive EC in Turner’s Emotion Taxonomy**

“An unexpected result” is how Bellocchi et al. (2013) described the overall positive phenomenon in their study. The mean EC valence indicates an overall positive rating—higher than the neutral Likert scale of 3—during most of the observation period. Exploring positive and negative ratings of the mean EC valence plot was not a sufficient enough data resource for emotion analyses. Bellocchi et al. (2013) proposed constructing a new method of emotion study
in school and classroom settings using intensity of EC or a range of positive ECs to analyze the effect of diverse interactions on the production of collective positive ECs. Based on Turner’s (2007) concept of emotional intensity their construction of emotional intensity sought to show that a higher range of positive ECs were consistent with high emotional intensity and the same with lower range of positive EC and low emotional intensity. In their study, they assumed that EC levels ranging from 3.1 to 5.0 could correspond to different types of class rituals and activities; for example, a high range of positive EC was associated with an informal discussion period, and a low range of positive EC was associated with a formal discussion period (Bellocchi et al., 2013).

Turner (2007) constructs intensities of emotions as secondary emotions that are subcategories of the four primary emotions of happiness, fear, anger and sadness. They are illustrated in Table 1.1. Bellocchi et al. (2013) utilized different levels of positive EC intensity in their post-hoc landscape analysis to analyze connections between different classroom rituals and activities by adapting Turner’s taxonomy of emotions to cope with the overall positive rating issue (p. 26) and to explain the phenomena of classroom events/interactions. Their extension and explication of existing EC theoretical frameworks certainly broadens self-awareness for science teacher educators (Bellocchi et al., 2013).

Bellocchi et al. (2013) pioneered the landscape study of EC with their new approach in preservice science teacher education programs. They established methods for investigating the intensity of EC valence in addition to the traditional analysis of positive and negative EC valences. They assumed that EC valences of different intensities during class interactions would have significant correlation with the successful and unsuccessful class interactions expected by Collins’ (2004) interaction ritual theory (Bellocchi et al., 2013). However, not only did they pay
attention to different ranges of mean EC valence at the moment of rating input to analyze the emotional intensity within the group, but they also paid attention to changes in EC valences for two sequential measurements of the EC (Bellocchi et al., 2013).

By utilizing both ranges of the mean EC valence and changes in sequential mean EC valence, they acknowledged that high mean EC valences corresponded to an increasingly positive collective classroom EE, and changes in the mean EC valence corresponded to a decreasing collective classroom EE (Bellocchi et al., 2013). Tobin et al. (2013) also hinted at a method of using differences in the EC for subsequent entries. Those differences were identified as the changes in the mean EC valence plots, factors in the EC analysis that reveal patterns/contradictions of interactions. According to Tobin et al. (2013) “[f]luctuations from high to medium to relatively low raise questions about the salience of EC as it is imbued in events as compared to EC as it is represented in a macro sense, i.e. for the whole lesson or a series of lessons” (pp. 75-76). This is not coincidental since researchers formulate their intellectual instruments by combining their ideas with their predecessors’ analyzing new data resources (Collins, 2004) that expands possibilities in similar studies.

In the next subsection, Bellocchi et al.’s (2013) new approach to measuring changes in collective EC valence will be refined and thus the mean EC valence change can be visualized by utilizing the EC data resources.

4.1.2 Refining the Construction of Change of EC Valence

New method designs featured in this chapter for post-hoc landscape event-oriented study use the collective EC data as a likeness indicator for further video/audio analysis. A new
analytical process is used in this post-hoc analysis to explicate the effects of collective EC and events/interactions upon school/classrooms setting (Bellocchi et al., 2013). By plotting a line graph of the continuous EC valence mean, which is usually utilized in emotion research, and by expressing the changing mean of the EC valence in each interval as a frequency polygon, we expand the possibilities of investigation in event-oriented research. More salient events can be detected and endorsed hermeneutically and polysemically by probing video/audio recording files, including after-class cogen sessions with extra self-reported EC reflecting the classroom EE as an indicator.

The main purpose of proposing the new analytical process in classroom emotion studies, following Bellocchi et al. (2013) and Tobin et al. (2013), is to illuminate the concept of calculating individual participants’ shifts in sub-sequential emotion ratings. By defining emotions as action dispositions, we can see how EC data describe functional behaviors (Lang, 1995). Bellocchi et al.’s approach considers changes in EC valences as an additional factor for the EC analysis. Since we can treat the mean EC valence as a continuous flux of occurrences at particular periods of time during class time (Tobin et al., 2013), the differences between two consecutive collective mean EC valence ratings can be equivalently expressed as taking the means after computing each participant’s emotion shift for each sequential entry individually by applying the summation property (Appendix A). Consequently, changes in the EC valence plot allow for a visualization of EC to proceed sequentially throughout the entire class as a frequency polygon graph. The analysis can then identify expressive dialogues and body-languages occurring in the classroom for further video analysis (Lang, 1995).

Changes in individual EC valence are in some degree reactions to events, for example, stimuli during a classroom lecture. They can be objectively computed by subtracting the
preceding rating input from collected EC data resources. With this analytical process, not only are individual and collective changes in EC data quantified, but more notably, with this methodology, they can be enumerated when emotions exhilaratingly arise as the maximum of 4 (=5-1), and when one’s emotion disturbingly sinks as the minimum of -4 (=1-5). Therefore, we can treat EC increases (Likert scale up) as positive change of valence and EC decreases (Likert scale down) as negative change of valence. It means that, for cases in which a participant sequentially enters the same rating scale, the participant’s emotions are not considered to rise or sink. We can consider the classroom EE does not have enough impact to make a particular participant’s emotion rise or sink in their EC valences. The plot Figure 4.2 below is the resultant graph using this analytical process.

![Mean of EC Valence Change](image)

*Figure 4.2 Mean of EC Valence Change (*Intervals where no bar shows are collective change of zero.)*
The computation of changes in EC valences not only confirms Bellocchi et al.’s (2013) idea of changes in the means of collective EC, but individual differences in sub-sequential ratings also contribute to the micro-level analysis of rising and sinking emotion for individual ECs.

Moreover, the benefit of computing changes of EC ratings for individual during each sequential interval throughout an entire class period instead of computing changes in aggregate mean EC valences is that, by computing each individual participant’s EC valence changes, we can extend the EC analyses to find emotional disparities. For example, a participant might record a change in emotion scale from 4 to 3 in reaction to a classroom interaction while another participant might lower the emotion scale from 4 to 1 for the same period. Another participant may increase her EC rating during the same period. As discussed in Chapter 3, EC and how one interprets the EC Likert scale is relative because arousal of emotions is often a function of structure and culture (Turner, 2007). Tobin et al. (2013) suggested further EC research about the association of EC with sociocultural classifications such as gender, race/ethnicity, or native language skill.

This method of computing each individual’s EC change through entire lesson makes a data analysis procedure possible during the post-hoc analysis that will address the overall positive ratings issue discussed in Chapter 3.
4.2 Event-Oriented Analyses and Results Associated with Week 5 EC Data

4.2.1 The Peaks and Troughs on the Mean EC Valence Plot

The Mean EC Valence line graph for week #5 of the BC study, Figure 4.1, shows significant peaks and troughs, which draw attention to indicators for video/audio analysis. The peaks and troughs identify salient moments. “Through interactions there is a continuous flux of emotional energy that can be linked to the salience of events experienced and the associated valence of discrete emotions” (Tobin & Ritchie, 2012, p. 119).

The highest peak at sequence #15 [Mean EC Valence—4.00; Elapsed Time: 1:16’29”] on the graph immediately draws attention. In a video/audio analysis, we notice that the rating input occurred immediately after the instructor declared a break in class, but there were no noticeable class interactions observed. However, I noticed, as the matter of a fact, that five research participants among 19 missed the EC rating entry at sequence #15 in the raw EC data resource. Due to a relatively large number of missing entries, and because of the anticipation of break time, class EE was subdued. Thus, this is considerably not the salient moment for a social interaction study.

A wide deep trough below the neutral level of 3 occurred from sequence #23 to #26 then unmistakably ascended. In the video/audio analysis, there was a screening of video-clips during this period followed by class discussions during the group presentation of the week’s topic, “Education, Gender, and Homosexuality,” led by Brad, Christa, and Petra.

During this trough sequence #23–#26, an occurrence of significant contradiction was observed in the analysis of video/audio recording files. Chapter 5 will analyze and discuss the
occurrence of this major classroom contradiction. Observations and analyses of peaks and troughs found on the mean EC valence plot reveal that some peaks are not associated with the salient classroom events, and some peaks and troughs need additional data resources such as evaluating standard deviations or analyzing cogen sessions to confirm salient events.

The group presentation started at the elapsed time of 1:18’26”. It corresponded to EC sequences between #15 and #16 through to the end of class. Two other notable peaks at sequence #18 [Mean EC Valence—3.89; Elapsed Time: 1:31’43”] and #31 [Mean EC Valence—3.84; Elapsed Time: 2:36’34”] are also related to the group presentation. However, there is a major decrease from #18 to #19 [Elapsed Time: 1:31’43”-1:36’46”] and a major increase from #29 to #31 [Elapsed Time: 2:27’24”-2:36’34”]. Since the increase from #29 to #31 occurs over 10 minutes, and since another interesting group interaction appears during video/audio analysis and is related to the large trough from sequence #23-#26, I will analyze, in Chapter 5, with additional data resources, such as a cogen session, this period of increase to the peak at sequence #31 as it ascended from #29.

In next subsection, I will discuss the EC Valence plot decrease from #18 to #19. In order for us to perceive some phenomena of class contradictions through changes in EC valences, which Bellochi et al. (2013) proposed, quantifying the changes in each period between segments and presenting them visually in graph form benefits further analyses. Therefore, I will expand this analysis to discuss the major decrease from #18 to #19 by employing the new analytical process described in the previous section.
4.2.2 Mean Change of EC Valence

As we discussed in the previous section, I am now employing the new analytical process that refines the concept of using the changes in EC valence as a complement measure for the EC data analyses in addition to the traditional mean EC valence created with self-reported EC data resources (Tobin et al., 2013). The graph of Figure 4.2 is the visualized mean of EC valence change in which the changes in EC valence for each individual research participants are calculated. Means for each interval are calculated and then expressed as rectangular polygons. Each polygon expresses the collective mean of the EC valence change. In the plot of the mean change in EC valence of week #5, the largest decrease in aggregate EC valence occurs in interval #18, i.e., between sequence #18 and #19 [Elapsed Time: 1:31’43”-1:36’46”], which I pointed out in the previous subsection. The decrease in aggregate EC valence is from 3.89 in sequence #18 to 3.26 in sequence #19, according to the mean EC valence plot (Figure 4.1). Although the mean EC valences for the two ratings are positive, a significant decrease of the EC valence rating occurs. In analyzing the video/audio recordings, the main narrative of the large decrease of mean EC valence rests upon a research team member, Olivia.

Olivia’s Monologues

During the group presentation led by Brad, Christa and Petra with the week’s topic, “Education, Gender, and Homosexuality,” Olivia, one of the BC study research team members, joined the discussion about the nation’s gender inequality. She started her monologue about the dearth of female scientists and their lack of recognition, in general, and oppression of women in
her native country, Colombia. Here, I would like to start with a transcript of her first monologue, which about the scarcity of professional women in science.

May I piggy back on your um … Chris ... um start is from the American um American University, women have shown that, um women have been since early age, had been indoctrinated that kind of on that idea that um they are less able than men or they are, the men are better in math and science. If you think of it, if you, if you read there are a very few women in science … in hard sciences. And one of the reasons is because um people, there is this conception that women are not as good as men, are not as intelligent, not capable of doing all of these math and you know high level course work, and so it’s from an early age, and still it’s, it’s um, it persists through a women’s career and I mean it has changed, but still there is that stigma that women are not as intelligent as men and there are you know better um for certain careers, so …

Olivia started her first monologue at the elapsed time of 1:31’33”; then the alarm to remind the research participants to rate their EC was overheard in video/audio-recording files immediately after she started her first monologue at 1:31’43”. It was associated with the aforementioned high peak of sequence #18 on the mean EC valence plot (Figure 4.1). It means that Olivia actually started her speech just 10 seconds before the high peak at sequence #18. The micro-analysis of her utterance found in video/audio recording files suggests that 10 seconds of her narrative before the alarm to remind participants to rate their EC was “May I piggy back on your ... Chris ... start is from the ...” Considerably, the beginning 10 seconds of this particular
part of Olivia’s narrative unlikely affected the high peak of the sequence #18 of Figure 4.1. Therefore her speech most likely influenced participants’ rating of sequence #19 at 1:36’46”, which occurred after her second monologue ended at 1:35’48” (Table 4.1).

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
<th>Duration</th>
<th>Total Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Monologue</td>
<td>1:31’33&quot; -</td>
<td>2 min 22 sec</td>
<td>4 min 8 sec</td>
</tr>
<tr>
<td></td>
<td>1:33’11&quot;</td>
<td></td>
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</tr>
<tr>
<td>Second Monologue</td>
<td>1:34’02&quot; -</td>
<td>1 min 46 sec</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1:35’48&quot;</td>
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*Table 4.1 Time & Duration of Olivia’s Monologues*

After Sarah’s short interposition following Olivia’s first monologue, Olivia started her second monologue about her lived-experience of women’s oppression. She spoke of interactions with her parents and about male-oriented/chauvinistic culture in her native Colombia.

And ah let me just make a last comment ahh I was born in Colombia, and um we are five girls and my brother. And when I asked my mother you know I … can I go to college? I want to go and pursue a college career, and she said no your brother is the only one that is going to be supported to go to a college, so we all (girls) were expected to get married, have kids, and stuff like that. So I have to do it on my own. So I come here, and you know going through like many immigrants, going through all the struggles to make it. Even in this society is that, a little bit more progressive than where I come from, I find the same you know resistance and in a 2-year school and 4-year school, I still, I also found a lot of people that supported me, a lot of
men, I’m not, you know I don’t consider myself as a feminist, if that’s you know something that people think that is a bad thing I don’t think it is, um but anyway, um but here I have also found um that same resistance, and it’s, it’s in every culture and you remember when you were asked to draw (a picture of) a scientist, everybody draw a guy, a man, right? And so it’s such a, it’s such a … ok, but it’s a reality, it’s a reality there are more um men than women in science because of all of those social issues.

The transcripts of Olivia’s two monologues show her strong opinions about gender inequality and oppression of women. She highlighted the shortage of female scientists in her monologues—and hence the prevalence images of male scientists in white laboratory coats. Olivia explained that the stereotypical image and misconception about women in the field of science is embedded and wrongfully reflected in the social structure of gender inequality. She echoed the conception that “women are not as good as men, are not as intelligent, not as capable of … high level course work (in science)” and that misconception often even misguides women’s career choices.

Olivia’s remarks about the lack of female scientists led her to illustrate her own story about traditional male dominance or paternal chauvinism in Colombia. In her second monologue, she summarized Latino culture with a personal example: her wish to go to college lacked support simply because she was a woman. Her dream of pursuing higher education was resisted by the social structure of male dominance. Such social structural resistance to progressive women’s career choices happens “in every culture.” She noted that the United States and Western societies were somewhat more progressive than her native country. Olivia clearly infers her
disappointment that her progressive image of gender equality in Western countries was altered after she came to the United States. She concluded her monologues with: “It’s a reality there are more men than women in science because of all of those social issues.”

As I mentioned in Chapter 3, referring to Zachareeya’s utterance during the EC rating intervention that his Likert scale 2 rating was prompted by a distressing part of a video-clip he had viewed, his clicking decision was a direct and simple result of an event in the classroom. Olivia’s powerful narrative about female scientists and gender inequality might arouse negative EE in classroom that perhaps led to an undesirable synchrony of the class that affected aggregate EC data to such an extent that it resulted in a fall in interval #18 in Figure 4.2.

The significant decrease in aggregate EC valence at interval #18 during Olivia’s narrative may have also resulted from her relatively lengthy monologues or univocal interaction. Olivia’s second monologue ended at 1:35’48”, so the total time of her two monologues was 3 minutes 25 seconds. It was considerably long time for speeches or monologues. An occurrence of significant mean EC valence decrease was not necessarily because of the depressing contents of Olivia’s monologues, but the length and style of the monologues, dialogues, group discussions or presentation. They changed the mood, and consequently they affected aggregate EE data.

According to Bellocchi et al. (2013) domination of a class interaction by one person, such as univocal interactions, is associated with a decrease in an individual participant’s EC. Were such a situation to occur no mutual focus or collective emotional arousal would be observed among participants. During the EC rating intervention, Laura noted her ratings sometimes depended on her interests or mood dissociated from her emotions toward the class events. Her comments suggest that some research participants entered low ratings not because of what was happening but because of a loss of attentiveness or focus. It is possible that Olivia’s lengthy
monologues diminished participants’ focus and consequently made the aggregate EC decline. Lengthy and univocal interactions can affect a fall in aggregate EC valences.

The other reason that may explain the participants’ loss of attentiveness resulted the significant fall in the mean EC valence that occurred during Olivia’s monologues was her lack of group membership/social bonds with students in the class. A sense of group belonging and social integration among a group can surface that corresponds to positive or negative collective EC (Tobin et al., 2013). She had a group membership in the BC study research team and participated in observations. Most of the research team members who participated in the BC study met each other during the Spring 2012 semester for the first time, but the students in this particular science teacher preparation program were familiar with each other from an earlier required course held in Fall 2011 semester. Olivia was not part of that particular group however. Her social bonds were weak simply because she was not a longstanding classmate.

Alienation is such an important emotion that it altered negative emotions in response to Olivia’s monologues. It could have resulted in a “pulling out response” that lowered the level of commitment to social structures and cultural codes that encouraged participation (Turner, 2007). In the situation here, Olivia was not a person who was alienated, but the student participants felt alienated or emotionally isolated. The students in the class perhaps synchronically felt that they were alienated listening to Olivia’s two monologues, and, as a result, they lost their foci more swiftly arousing withdrawal responses from the active class participation. Levels of attention decreased when they were listening since she was considered an outsider of the program. Consequently, individual EEs were collectively downcast.

Additionally, some participants may have been confused regarding to Olivia’s opinions and insights toward feminists and feminism. She said in her second monologue that “… I also
found a lot of people that supported me, a lot of men, I’m not, you know I don’t consider myself as a feminist, if that’s you know something that people think that is a bad thing I don’t think it is …” It might have been awkward for someone to hear Olivia, who was victimized by male chauvinistic culture, say that she was supported by “a lot of men” during the discussion of gender inequality. Yet in any case, whatever research participants thought about her comments about feminism depended on how they had understood her definition of feminism, and the meaning of what she had said might have elicited some frustration and resulted in the fall in aggregate EC valence.

I listed reasons above why the great decrease we observe in Figure 4.2 may have occurred immediately after Olivia’s monologues. I assumed that EC ratings were corresponding to the Olivia’s speeches as class interactions. The connections between events in the classroom and research participants’ aggregate EC ratings might not be found by the methodology of EC data analyses in this chapter, yet computing aggregate EC valence change from individual’s EC valence changes utilized in this chapter as a new analytical process supports to interpret that interactions were not limited to the contents of what was happening, but the characteristics of utterances or dialectic interactions affected participants’ EC.
CHAPTER 5: Collective EC Data as Non-Verbal Utterances

5.1 EC Analysis Method Design on Carnival and Rupture Identified by Video Analysis

The design of this study is based on a phenomenological approach and theoretical framework of event-oriented inquiry. Analyses conducted in this chapter use the same video-clips and EC data from week #5 of the BC study as in Chapter 5 for the meso/micro-analyses. I also perform a micro-analysis of the EC data and video/audio recording files from week #5 that correspond to classroom events/contradictions. However, the method of analysis in this chapter includes, first, salient classroom events that resemble carnival-like moments (Bakhtin, 1988) or ruptures (Sewell, 2005). They were identified in an analysis of week #5 video/audio recording files. I then determined how those carnivals and ruptures affected the collective classroom EE environment through participants’ corresponding EC data. The phenomena of such carnivals and ruptures detected by video/audio analysis are ethnographically analyzed by utilizing the EC data resources as collective non-verbal utterances, which show how such events/interactions affect the collective EC of the particular classroom and solidarity and group membership among research participants. Defining emotions as action dispositions (Lang, 1995) makes delineating the EC as functions depend on particular carnivals and ruptures of events/interactions as possible independent variables.

In addition, the measurement of the displacement activity, which is also treated as a micro-analytic non-verbal utterance, is adopted to analyze body-movements. I assume that there is a correlation between physiological and behavioral phenomena (Troisi, 2002). Additionally, a video/audio analysis of cogen sessions is employed in the second part of this chapter to interpret
a phenomenon occurring in the last-minute classroom to confirm the collective positive EC in a carnival-like EE atmosphere.

5.2 A Tale of Brad⁵—Rapture in the Classroom

5.2.1 Prologue

Today, the class of week #5 of the BC Study started rather quietly. Anticipation of where today’s discussion was going and where it would end up was subdued, and nervousness and antsy-ness of today’s presenters’ emotion was restrained, surrounded by the relaxed low-key atmosphere of the class. Even after declaration of starting today’s class announced by Professor Alexakos, instructor of the class and one of the principal investigator of the BC study, was overheard, some students were still chatting with each other and neighbors. They greet each other cheerfully, and at about the time other people were eating dinner they circulated snacks to assuage their hunger in counterclockwise motion. There were twelve bulky tables situated in the laboratory room. Two tables were put together to evenly divide the students into six groups. With his usual smile, Professor Alexakos asked the class, but no one in particular, “What’s the topic we’re discussing today?” Some students casually replied, “Gender.” Some students, who were hardly paying attention, still needed time to adjust their emotions to the class’s somewhat positive collective EE. Having just gotten out of their chaotic classrooms they were changing their stances from

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⁵ In this section, I was suggested by Dr. Kenneth Tobin to choose the method of storytelling adapting Waldman’s (2015) writing style to attract readers for this particular episode about Brad’s speeches (K. Tobin, personal communication, 2014). Therefore, the narrative passages are from my perspective of what I was observing the video footage to express what was going on in the classroom as detailed as possible, and thus they are expressed in Italic in this chapter.
teachers operating in a difficult environment to somewhat less responsible students. Some students were still offering classmates snacks, proud to present them with enthusiastic recommendations and pass them around. They were looking for chances to dive into today’s discussions and share opinions about today’s topic, Gender and Education. Professor Alexakos was calmly trying to get all students’ attention by casting questions to the students “… so we're talking a little bit about a gender…and who's presenting?...we have something, a presentation about gender, right? What else?” Then Brad, who was one of the presenters and who apparently was only the one in the class attentive to what was going on, answered with confidence to Professor Alexakos’ last question in a flash, “Sexuality.”

5.2.2 Group Presentation

During a class discussion in the pre-presentation period, Brad was a bit nervous touching his face almost habitually. After the anticipated break was over when roughly half of today’s class time with its low-key and relaxed EE had been passed through, today’s presenters/co-teachers, Brad, Christa, and Petra were ready for their presentations gathering and walking toward the front of the classroom with notebooks, papers, and confidence. They were welcomed by the science laboratory teachers’ enormous desk with a sink and two faucets and by their enthusiastic classmates’ orchestrated claps and hailing “yeah.” It was as if the classmates were an audience at a nightly talk show replying to an LED sign flashing, “APPLAUSE.” Christa then opens their presentations about gender and education with pride.
Including Brad, the presenters and the class were still in a relaxed mood with laughter in the background and a positive EE saturated atmosphere. Students responded to Christa’s brain-teasers/jokes, the opening act for their presentation. Christa’s brain-teasers, although the jokes were mocking women, and there were some “woo”s reflecting some students’ critiques about Christa’s brain-teasers overheard, made the mood or the EE in the class seemingly still positive. All students became attentive and mindful. The opening presentation by Christa prepared the class well for the next presentation. The mood of her presentation carried over to the next performance and mitigated the solemnity of “Gender, Education, And Sexuality.” The controversial topics set up the possibility of a quick rupture. “This one I know all of you gonna go upset. How many feminists are needed to change a light bulb?... None, feminists can’t change anything.” Audiences, however, started perceiving slight changes in the collective EE according to their feelings/thoughts toward this last joke during a class discussion ... as in Christa’s prophecy.

Meanwhile, compared to Christa and Petra, who most of the time were standing straight, looking proudly at the audience, which later would respond to Christa’s brain-teasers during the discussion with a little tension, Brad’s behavior looked different from the other presenters, standing at the stage left by himself. He touched his face—nose, ears, mouth—frequently, scratching his neck and belly as if he had a minor allergic reaction. He stared downwardly for a while, fiddling and turning pages a small notepad in which apparently was his memo for the presentation—but it did not seem he was really reading it. His eyes were swimming without focus, he looked around the classroom restlessly more than necessary, was nodding away to the other students’ comments more than necessary, but looked as if he was just back-channeling to
make agreeable responses. He looked at his watch on his left wrist and nervously checked the
time quite often, and curiously enough that he kept drinking his can of energy drink even after he
obviously emptied the can. He appears somehow fidgety and less composed, and he seemed not
even mindful.

5.2.3 Displacement Activity—Restoring Homeostasis to Cope with Stressful
Situations

Considering that he was one of week #5’s presenters, Brad’s anxious appearance was
quite natural. There were multiple indications I found in the video/audio recordings such as
excess expressiveness, thirst, and displacement activity support the interpretation that he might
had been stressed in this week’s class.

“Anxiety occurs when a person experiences a situation as personally threatening, either
physically or psychologically, which triggers physiological responses and various coping
strategies” (Laukka et al., 2008, p. 197). There are situations in which classroom teachers are
well aware that it is necessary that students give the impression “I AM paying attention to what
you are saying” in order to hide mindlessness or less-attentiveness to the lecture or other
people’s utterances. “[S]ome people can read body language and tone of voice as clearly as a
billboard while to others these nonverbal cues are a foreign language” (Davidson & Begley,
2012, p. 3). And teachers should be experts at reading students’ body language, and helping their
students conceal anxiety and nervousness in the classroom. However, we know that Brad was
mindful and focused on the week #5 class and his group’s presentation. The quick response he
Physiological reactions, subjective emotions, and behavioral changes are three distinct responses in the phenomenology of the stress pattern (Chrousos & Gold, 1992). We can observe in Brad’s behavior patterns of physiological stress—excessive expressiveness, frequent drinking, and touching face/body parts—*displacement activity*.

Human stress research has relied on physiological measures and the behavioral patterns (Troisi, 2002). Displacement activities, which are valid measures of stress in nonhuman primates and human beings, are behavioral patterns of the adaptive stress responses caused by autonomic processes activated during stressful situations, and the evidence that displacement activities represents an important function for coping with the impact of stressful has been repeatedly advanced in the ethological literature (Mohiyeddini, Bauer, & Semple, 2013). Therefore, displacement activities consisting mostly of body movements such as self-touching, scratching, and self-grooming have analytical salience (Troisi, 2002). Displacement response mechanisms in stressful situations, for example, increase blood flow or sweating, may demand responses of displacement activities such as scratching to counteract the effects of the stressors and restore homeostasis to reduce negative emotion arousal, much in the same way that gentle body touching causes relaxation and a reduction in heart rate (Drescher, Gantt, & Whitehead, 1980).

As seen in the video/audio recording files, Brad’s body movements—face/mouth-touching, face/body parts-scratching, and finger-fiddling with objects—during his groups’ presentation were behavior patterns of displacement activities of the Ethological Coding System for Interviews (ECSI), an ethogram designed for measuring nonverbal behavior (*Table 5.1*). It suggests that displacement activities can be the measurement to analyze the correlation between...
the physiological and behavioral phenomena of human stress because nonverbal behavior patterns can give more veridical information about the subject’s emotional state than verbal statements and facial expression in research related to human stress concept defined as emotional leakage (Troisi, 2002, pp. 47, 48, 52 & 53).

<table>
<thead>
<tr>
<th>Displacement Activity</th>
<th>Physiological Movement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groom</td>
<td>The fingers are passed through the hair in a combing movement.</td>
</tr>
<tr>
<td>Hand–Face</td>
<td>Hand(s) in contact with the face.</td>
</tr>
<tr>
<td>Hand–Mouth</td>
<td>Hand(s) in contact with the mouth.</td>
</tr>
<tr>
<td>Scratch</td>
<td>The fingernails are used to scratch part of the body, frequently the head.</td>
</tr>
<tr>
<td>Yawn</td>
<td>The mouth opens widely, roundly and fairly slowly, closing more swiftly. Mouth movement is accompanied by a deep breath and often closing of the eyes and lowering of the brows.</td>
</tr>
<tr>
<td>Fumble</td>
<td>Twisting and fiddling finger movements, with wedding ring, handkerchief, other hand, etc.</td>
</tr>
<tr>
<td>Twist Mouth</td>
<td>The lips are closed, pushed forward and twisted to one side.</td>
</tr>
<tr>
<td>Lick Lips</td>
<td>The tongue is passed over the lips.</td>
</tr>
<tr>
<td>Bite Lips</td>
<td>One lip, usually the lower, is drawn into the mouth and held between the teeth.</td>
</tr>
</tbody>
</table>

*Table 5.1 Displacement Activity of the ECSI (Troisi, 2002, p. 48)*

Occurrence of displacement activities correlates with ratings of anxiety (Ekman & Friesen, 1972). Notable displacement activities of the presenters, Brad, Christa and Petra displayed were tallied in *Table 5.2*, and to visualize their behavioral patterns, the total frequency of displacement behavior of three presenters are expressed as bar-graphs in *Figure 5.1*.

I must note that the category of displacement in *Table 5.2* does not fully agree with the ECSI list of the displacement activities in *Table 5.1*. In my observations of video/audio recordings, I omit the displacement activity of *Fumble* from the check-list of *Table 5.1* since Brad was holding his memo. Furthermore, the distance from the camera in the back of the
classroom to the front desk where the presenters were standing and the low resolution of the images of video/audio recordings made it hard to discern whether presenters engaged in *Twist-Mouth, Lick-Lips,* or *Bite-Lips.* I counted as one activity: touching the right and left eyebrows with same hand in one smooth motion or consecutive motions of touching the same parts of face and body such as rubbing nose right-left-right. Brad did not *Groom* or *Yawn* even once.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Face/Body Part</th>
<th>Brad</th>
<th>Christa</th>
<th>Petra</th>
</tr>
</thead>
<tbody>
<tr>
<td>Touching/Scratching/Rubbing</td>
<td>Head</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Eyes/Eye Brow/Forehead</td>
<td>24</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Ears</td>
<td>10</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nose</td>
<td>25</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>Mouth/Chin/Cheeks</td>
<td>21</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Neck/Shoulder</td>
<td>19</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Belly</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>103</td>
<td>28</td>
<td>31</td>
</tr>
</tbody>
</table>

*Table 5.2 Presenters’ Displacement Activities during Their Presentations (Duration: 1:12’59’’)*

![TOTAL DISPLACEMENT ACTIVITY](image)

*Figure 5.1 Presenters’ Displacement Activities during Their Presentations*
Compared to Brad, whose head/body movements were fidgety, Christa was holding her hands/arms together in front or back during most of her presentation period. Sometimes she tried to roll up her shirt sleeves. Petra was holding her hands together in front as well, but her fingers fiddled with her arm/elbow/hand and some unrecognizable object, rubbing her arms quite often. Petra’s body conspicuously swayed sideways. Both twisted their wristwatches. Petra, seemingly a bit more nervous than Christa, touched and scratched more often, but compared to Brad she probably was not nearly as anxious. Table 5.2 and Figure 5.1 show Brad’s displacement activities total three times more than Christa’s or Petra’s.

Brad’s total displacement activity count could have been the result of illness or allergy. However, not only Brad, but as well as the co-presenters barely show significant face/body movement of touching/scratching/rubbing during their own individual presentation time assuming illness or allergy causes such displacement activity consistently. Therefore, considering face/body parts touching/scratching/rubbing caused by some sickness/allergies may be ruled out.

Brad expressed anxiety and stress during his presentation by bringing his drink to his mouth 11 times, which must have emptied it before he concluded his 21 minute 38 second presentation. Of course, we need to be cautious because we do not know the reason for the frequent intake of fluids, but notably he kept bringing the can to his mouth 10 minutes and 6 seconds after he had obviously emptied it, as if he had completely forgotten he had emptied it.

People consume liquids not only to satisfy a thirst or as an accompaniment to food, but also due to habit, custom, illness, or social ritual. Large quantities of water can be imbibed for inner cleansing or to alleviate feelings of being unclean or of being unworthy in a religious sense (McKinley et al., 2004). Moreover, fluid intake may be an indication of displacement activities
to cope with stressful situations. If fluid is in reach, the displacement activity of drinking occurs, and if food is available, a displacement activity of feeding occurs (Troisi, 2002). Brad may not really be in a stressful situation, but excessive thirst could be why he frequently drinks, an indication of his nervousness in addition to the displacement activity of touching/scratching/rubbing. In the next section, we will discuss why Brad may have been in a stressful situation. It may not have been simply because he had a role as presenter but because of his gay sexual orientation to represent a related topic, sexuality.

5.2.4 The Video-Clip Presentation— Brad Coming Out

First video-clip prepared by today’s presenters, and introduced by Petra about single-sex schools and sexuality in the school titled "Bullying: Words Can Kill" was started after a short break due to technical difficulty. The break gave another chance for the audience to have snacks to satisfy their hunger—the clock in the classroom had just passed 7 o’clock. Brad’s eyes were glued on the screen which covering the half of the blackboard in the front of the classroom. For a while, in a way, he looked mesmerized by the first video-clip. Presumably, though, the presenters had watched the video clip maybe more than once prior to the presentation. Then Brad started looking at his notepads, which were probably his memo about the second video clip presentation. Immediately after Petra stopped the first video-clip, Brad received a baton for presenting their second video-clip, which he personally had chosen. He seemed a bit nervous started explaining with a lot of hand gestures the background of the second video clip about

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homosexuality and a student's suicide from bullying. In the classroom, the EE atmosphere had already been shifting lower because of the content of the first video-clip supposedly. Brad said:

All right, so, um just see if you see a little background of other one we have actually um video …from CNN it’s called …called um War Over Sexual—Homosexuality in the Classroom. And um just to give you a little background of it, it’s about um simply about this girl um it’s in a Anoka Minnesota school district um she committed suicide and it’s kind of you know …from there how the, the school fall through or how they didn’t fall through um…with … point she was getting and a …whole neutrail—neutre—neutrality policy, which is basically they are not allowed to get stand up homosexuality they are now um…(video clip unexpectedly started playing and Brad’s monologue was inaudible for 4 seconds.)…um now safety of agree or disagree now allow to, you know teaching schools um, and um it kinda goes on with an really there is gonna be a controversial bill in the news it’s called Tennessee “Don’t Say Gay” Bill… um basically what it was to, uh is that it’s an backed by Stacey Campfield I think it’s his name um he basically doesn’t wanna gay abuse at all in the classroom like from preschool to 8th grade now talk about homosexuality or gay or, or any that kinda stuff and then 9th grade start talking about and …his argument is, is that um he said that he’s not …um…(beeping for click)…he is um more so he’s his argument was … but you don’t have to talking about biology anyway so why we talk about it it’s you know… reproduction and between her sexuality it’s not what about social studies or what about English study …talk about

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their understanding biology standpoint why isn’t you know, you know related but in other, another pieces it is so um and just so you know passed in a house committee a couple of weeks ago so it’s’…coming legal … and so just go ahead and um…

The second video clip Brad had chosen started playing. Everyone was watching the video-clip very quietly and earnestly as if everyone in the classroom was trying to take in all that LGBTQ children were going through in schools. Showing in their facial expressions their gut-wrenching and simultaneous feeling and fascination watching something uncomfortable, but such a mesmerizing subject was suddenly interrupted by an alarm reminding the participants to click their EC almost at the end of the video-clip. There was a display in the classroom of everyone who was a bit startled by the alarm. That they grabbed for the clicker all at once indicates their emotional synchrony. After the video clip was over, the mood of the class seemed somewhat down, and the class EE seemingly hit the bottom. Brad broke the silence and a bit sheepishly asked the class, “Ah~ any comment?” After the comment made by Zachareeya, some other students raised their hands, and were eager to contribute their thoughts and opinions to the discussion. Responding to Zofia’s question about the school district in Minnesota in the video-clip, Brad explained the current situation in the district zealously as if he were a designated advocate. After Laura made a comment, Brad eagerly wanted to interject his views about homosexuality, but in his role as a moderator, he had to let Edward speak first. Brad who was patiently waiting for his moment, perhaps since he first was assigned the topic of sexuality and education in the beginning of the semester. Holding back his intense emotion but ready to speak out, he finally got the chance to interject. His words and sentences he had been holding back
gushed out from his mouth like a waterfall although often fractured because of his nervousness.

Brad said,

…aah just a quick personal phrase that um I did wanna just say um I think we all should um take advantage of this experience um the fact that came match over sexuality or homosexuality because um, um it’s in an article that remember that most teacher preparation programs we don’t get this kind of experience, they don’t talk about homosexuality in word activity gay in the classroom so um I think we’ve privilege and appreciate that being in kind of experience …um and as far as were you touch I think that’s a… huge, huge problem with schools is there um and I just wanna say I am gay, so I know exactly what it is like to be in these kids, kinda shoes that means torturistic point but …drastic but …I still got it so um it, it’s, ’s hard for me to hear that the school district isn’t doing anything at this point…and um so it’s also…to the point where I personally felt I was alone and …you are secluded in a classroom …you don’t have really to connect it so it’s, it’s really hard and I think this is kind of touching and just a little of it kind of opens eyes a little bit and and and hopefully it all make sure you guys keep it open and accepting …point of view when you going to your classroom that there might be a gay student in there …has difficulty dealing with it so um I think it’s just a very important we’re touching that …getting this kinda experience so um, is there anything else?

In both of Brad’s speeches, introducing the second video-clip before he started playing it and his speech of coming-out after the video-clip was over, numerous pauses and
fillers/vocalized pauses were noticeable. Whether having fillers more than occasionally is his usual style of utterance or not is uncertain. However, we should consider that anxiety has an impact on nonverbal aspects of speech, and the most consistent and largest effects of anxiety are found in the proportion of pauses. The proportion of pauses decreases as anxiety levels decrease (Laukka et al., 2008).

After his coming-out talk, Brad’s displacement activity became different. *Table 5.3* below provides the comparison of displacement activity counts before/during his coming-out speech and after his talk up to the end of the video recordings in the middle of his group’s presentation.

<table>
<thead>
<tr>
<th>Brad 's Displacement Activity</th>
<th>Face/Body Part</th>
<th>Before/During Coming-Out Speech</th>
<th>After Coming-Out Speech</th>
</tr>
</thead>
<tbody>
<tr>
<td>Touching/Scratching/Rubbing</td>
<td>Eyes/Eye Brow/Forehead</td>
<td>16</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Ears</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Nose</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Mouth/Chin/Cheeks</td>
<td>18</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Neck/Shoulder</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Belly</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>82</strong></td>
<td><strong>21</strong></td>
</tr>
</tbody>
</table>

*Table 5.3* Brad’s Displacement Activity Before and After the Coming-Out Speech

As witnessed in the video/audio recordings, his displacement activities after his coming-out speech became significantly much less frequent. According to *Table 5.3*, 82 incidents of touching/scratching/rubbing occurred in the 47 minutes 15 seconds that elapsed in class from 1:18’26” to 2:05’41” before the utterance of Brad’s coming-out moment. Displacement activity took place, hence, 1.74 times per every minute before/during his coming-out speech. With 21
occurrences of touching/scratching/rubbing during the 19 minutes 28 seconds that elapsed from 1:18’26” to 2:05’41”, there were 1.08 incidents per minute after his coming-out speech. The measurement of touching/scratching/rubbing is an indicator of stress/anxiety. A displacement activity count of before and after Brad’s coming-out speech and a displacement activity count comparison with his co-presenters also suggests that he was anxious in such a stressful situation to him up to the moment of his speech, and we can presume that Brad was liberated from his stressful situation after his coming-out speech.

Brad noted that “we don’t talk about homosexuality in most teacher preparation programs,” and so he chose the second video clip War Over Homosexuality in the Classroom to show participants for this “privileged and appreciated experience” that there still exist children at every school who struggle with their stand point of being gay and their relationships with classmates and teachers. He did so to empower his classmates.

The clear and compelling message Brad conveyed with this opportunity to present the video-clip was his wish to empower future teachers in this teacher preparation course and reassure them about LGBTQ issues at schools. He hoped the BC Study participants would disseminate to broader audiences the current situation about oppression of LGBTQ children in schools. He wanted teachers to be open in their ontological stance, and consequently he sought institutional change akin to changes brought about by the Supreme Court of the United States rulings that guarantee a right to same-sex marriage rooted in the ruling that there is a fundamental right to marriage for all persons to have equal dignity in the eyes of the law to enjoy liberty (Liptak, June 26, 2015).
5.2.5 The Collective EC Valence at the Event of Contradiction

*Figure 4.1* shows that sequence #25 [2:07’09”] of the mean EC Valence is the lowest during the entire period of week #5, and this is the first EC rating to follow Brad’s coming-out speech. It is natural to wonder if this lowest mean EC valence, which is expressed as a collective negative EC, indicates a correspondence to Brad’s coming-out speech. That is, did Brad’s coming-out speech lower the class EE to the extent that the aggregate EC became negative?

According to the EC analysis, when using the standard deviation of the EC valence, the collective mean EC valence at sequence #25 was the lowest negative mean EC valence in *Figure 4.1*, but the low mean EC valence does not necessarily imply every participant’s emotion synchronized low. The standard deviation at sequence #25 in *Figure 5.2*, below, shows the highest standard deviation during the period of the class, and it indicates that the collective EC valence in the class was more disperse at that moment. It implies that participants’ EC valences were no more synchronized than at any other sequence points. Individual EC valences corresponding to Brad’s group’s presentation were more mixed. Are these mixed valences a response to the Brad’s coming-out speech?
In the mean change of EC valence in Figure 4.2, interval #24—the interval between #24 and 25—does not only indicate significant changes in participants’ EC valence, but it shows a positive change. Analyzing this outcome, we see the decline in sequence #25 for the mean EC valence in Figure 4.1 expresses the lowest of the mean EC valence, but it is not necessarily the result of Brad’s coming-out speech. The low mean EC valence starting from sequence #22 is presumably because of the two video-clips the presenters played followed by Olivia’s monologues analyzed in Chapter 4. The low standard deviation of the change of EC of Figure 5.3 below at interval #23 (between #23 & 24) indicates that the change was somewhat synchronized before Brad’s post-second video-clip speech (from #23 to 28). The low mean EC valence at segment #25 in Figure 4.1 does not necessarily follow from Brad’s coming-out speech. But, the continuation of the low standard deviation in Figure 5.3 from interval #23 to 27 shows the majority of the class experienced the EE in the class similarly in some degree.
The lowest mean EC valence, at the sequence #25 in *Figure 4.1*, was not necessarily because Brad’s speech made everybody uncomfortable since the lowest mean EC valence occurred immediately after following the second video-clip about the LGBTQ student bullying and subsequent suicide in the single-sex school according to the micro-analysis of the EC plots that corresponded to the sequences of class time.

One of the research participants, Zachareeya, commented during the heuristic intervention for the EC scale ratings that he clicked 2 for his EC the entire time during the group presentation in the previous week because the video-clips the co-teachers presented made him simply sad enough to rate everything negative (2 on the Likert). His testimony supports that presenters/co-teachers can use visual material such as video-clips to make the entire EE saturated.
with negative or positive feelings, and such a powerful EE reflects both individual and collective EC.

The EC analysis prompted me to ask why classroom participants were not surprised by Brad’s coming-out speech. Possibly some of his classmates already knew his sexual orientation since most students in this sequential course had taken this or other education classes with him before.

I titled this section *Rupture in the Classroom*, juxtaposing it to the title of the next section, *Carnival in the Classroom*, but rupture here does not necessarily mean chaotic, tumultuous, or expecting a big commotion in class, nor does it have a negative connotation. In Brad’s coming out speech, his utterance “I am gay” may not the most important piece of this section; instead, his entire message in his speeches both before and after the second video-clip presentation are key components of this section. Brad conveyed well to the BC study participants a clear and compelling message. He chose his video-clip to empower fellow students in this teacher preparation course that they should not only make clear the school situation LGBTQ children experience but also improve the teachers’ ontological standpoint on homosexuality and education. Brad used this opportunity to speak openly, and was appreciative that the study participants spoke openly in a respectful manner that made him comfortable. The strong indication of that is found in the closing statement he made at the end of the class while the students were ready to go home.

### 5.2.6 Epilogue

*Now a long tiring day for everybody in the classroom was wrapping up. Brad softly and modestly, a bit hesitantly, opened his mouth to complete his mission with a closing statement.*
…can I just say one last thing quick? …am I allowed? are we tired, do I have time? …don’t worry, I won’t take too long, I myself want to go home after this. um…I wanna thank you for being very respectful over this whole…application and it’s heavy stuff … so I just like that it’s … respectful and um very open and comforting, you know that’s important, and I hope …and this kind of atmosphere can be brought, and every classroom …teachers bring this into classroom and …and help …we are there first, students……gay straight you know black white whatever it is just over there for that I think that’s the most important thing.

5.3 Positive EE Generated by Mutual Activation with Non-Verbal Communication

5.3.1 Peaceful Closure and Ritualistic Repair Routines

Because of the limited presentation time, the first video-clip, which the co-teachers prepared and showed week #5, was only a beginning 8-minute-long segment of a 43-minute TV program. Petra probably felt that she needed only the 8-minute segment to inform the participants about what happened to a boy who seemed to have been saved from being bullied at his school. She explained that the boy actually tried to commit suicide at the end of the TV program. We can see in the video/audio recordings that some classmates gasped responding to Petra’s information. She probably sensed the participants’ EE drop and then concluded her speech saying, “…sorry it’s a downer.” The class quickly responded to her last comment with chorus of “Yeah right, downer!” with some sarcastic laughter. According to this part of the
dialogic interaction and the video/audio analysis prior to the conversation, we can surmise that a collective positive EE was filling the classroom before she informed classmates of the boy’s near tragic ending.

Almost at the end of the class, some students responded to Professor Alexakos with an evaluation of the class’s emotional content. Rose commented that today’s topic was “heavy,” simply “too much.” Because of the emotion-laden topic of “Gender, Sexuality, and Education,” it was likely that before Petra’s speech classroom participants were trying to reactivate the positive EE but any verbal exchange. It seems that many students were trying to make the class EE a bit more positive before they left the classroom. It is significant that “cogeneration of understanding and respect of others, solidarity, and identity inscriptions associated with belonging to this group and collaborating with its members to arrive at agreed to goals” (Tobin, p. 24, 2013). Ritchie et al. (2011) noted classroom success occurred when teachers and students produced dialogical interactions collectively rather than individually. Video/audio files showed that group membership and dialogic interaction/group discussions affected behavioral approach/activation systems such that the structural, group effects on EC, information processing, perceptions, attention, and behavior, were to be expected (Park & Hinsz, 2006).

Although collective effervescence is temporary, it restores group solidarity and improves individual EE over the long run. Repair rituals are to compensate the contradiction of events (Turner, 2007) suggestively decrease collective EE. Initiating repair rituals leads to collective effervescence (Collins, 2004). Considering participants meet with the same people every week for 15 weeks, peaceful classroom closure is important for classroom solidarity. Tobin et al. (2013) stated that repair rituals were critical classroom actions for maintaining positive EC
throughout the entire lesson. It seems that the students in the BC study in week #5 mutually practiced this repair ritual with non-verbal communication.

The Japanese have a popular saying, *owari-yokereba subete-yoshi* (終わり良ければすべて良し), which translates into the title of Shakespeare’s play, *All's Well that Ends Well*. We generally do not want to leave an environment with troubles or bad feelings. The students in week #5 apparently did not want to leave with gut-wrenching feelings. The closing ritual was naturally and mutually produced with non-verbal communications at the end of class as a repair ritual.

Repair or closing rituals are common in transitions from one practice to another or moving from one environment to another. We witness closing rituals and opening rituals in both professional and amateur sports: Raising team/country flags and singing national anthems are typical opening ceremonies. Players often make a circle and perform their chants rhythmically and loudly to unify their minds and to motivate themselves before a game; High-fiving each other when the team wins, praising the efforts of winning and losing teams, or sharing special good luck chants after a game are typical closing rituals not limited to sports. “As can be observed, the variable that has the greatest impact on the intention to participation in actions supporting negotiations is enthusiasm. This highlights the fact that there is potentially a type of collective action, of a proactive nature, which is linked to positive emotions” (Sabucedo, Durán, Alzate & Barreto, 2010, p. 31).

In Japan, in any martial arts practice, practitioners must exercise the secular practice of silent/breathing meditation for mental concentration before and after practice to calm themselves, empty their mind, reflect on the day’s practice, and reach mindfulness.
5.3.2 Cogenerative Dialogue for Valuing the Quality of Learning Environments

A cogenerative dialogue (cogen) meeting, which was also captured in video/audio recording files, was regularly held after class dismissal for the BC study research team members and volunteer research participants. Cogen discusses what happened in class in a reflective conversation with dialogic inquiry to improve the quality of teaching and learning. It is a heuristic methodology. The cogen session data not only support our claims and hypotheses, but they allowed students to ratify their feelings reflected in their EC data. It also allowed for the identification of patterns of classroom conversations and body movements through video/audio recordings (Ritchie et al., 2011). Subjective EC ratings are one-way interactions whereas transformative cogens reflect delayed mutual and reflexive interaction communication.

During the cogen session in week #5 after the dismissal of the class, Ken Tobin recaptured the meaning and efficacy of cogens to bring a class together. Considering the quality learning environment we value, he felt that calling research participants for a cogen session would be a worthwhile process to correct the on-going class EE, if it went wrong.

Tobin pointed out that synchrony/entrainment is about focus, i.e., entraining can occur in the ongoing flow in a classroom to maintain positive EE to some extent. Tobin told the cogen participants that his research team had identified in video/audio analysis moments when students rolled their eyes. The research team pointed the moment out to the students and showed the video-clip to avoid such disruption in future classes. Students assured that it would not happen in the future, and they would maintain positive class EE and synchrony in the class.

Frequent dysfunctionality occurs in classes because of the existences of high levels of asynchrony (Tobin, 2013). Contrapositively, it is true that synchrony in classes is a necessary
condition for functional classes, i.e., classes with a quality learning environment. In the cogen we make an effort to avoid such contradictions to reach class synchrony/entrainment and maintain positive class EE for the sake of students’ learning practice.

Following Tobin’s statement, Professor Alexakos made a comment about the efficacy of conversation happening at the end of the class in week #5. He thought such amendment of the class EE certainly happened at the end of the class. The conversations at the end of week #5 class discussing the depressing topic of *Gender, Sexuality, and Education* reflexively calmed down participants emotionally, and the class EE returned to positive. He believes discussion may be needed at the end of every class as a closing repair ritual. He clearly sensed that discussion at the end of class would make class EE positive.

According to the video/audio analysis of the dialogic interaction between Petra’s speech and the response of the class and Professor Alexakos’s comment during the cogen, the negative EE after the second video-clip presentation was seemingly corrected to positive. When did the turning point or the EE repair ritual exactly happen? How was the repair ritual, if there was such moment, initiated? Did the repair ritual successfully maintain class synchrony and positive collective EC, reflecting the collective EE, until the dismissal of class?

5.3.3 Mean and Central Tendencies of the Collective EC Valence

According to the video/audio analysis of the interaction between the Petra’s “downer” speech and the participants’ responses to the chorus of sarcastic laughter, the mood or the EE atmosphere of the class became positive towards the end of the class period. In Figure 4.1, the mean EC valence from sequence #29 to 31 indicates an increase in class EC valence, and the
mean of EC change in Figure 4.2 suggests that a decrease in EC change caused a reverse in direction and started to rise at interval #28. And according to the standard deviation of the EC valence—represented in Figure 5.2—we observe much less dispersion suggesting not only the occurrence of a collective positive high EC valence (see Figure 4.1) but also that the synchrony/entrainment of the class was happening at sequence #31. The EC data indicate that there was an increase in mean EC valence for a majority of participants around sequence #27-28 in Figure 6.2. Class synchrony assured the group solidarity/social bonds became stronger among the participants of the class. This is confirmed because the standard deviation of the EC started decreasing at sequence # 27 in Figure 6.3 and becomes less. Less dispersion occurred as time proceeded from the turning point of #27.

Following Brad’s second video-clip speech, discussion of LGBTQ issues continued heating up. During the non-formal discussion, sexual orientation issues veered off topic, broadening into sexuality, culture, race, and family matters. After 15 minutes of the students sharing their opinions, Professor Alexakos interrupted the discussion, summarize their opinions, and redirect the discussion back to the topic of inclusion of sexual orientation in school systems and teacher preparation curriculum. This might be the turning point or repair ritual to correct the class EE. After Professor Alexakos’s formal announcement of a more focused class discussion, around sequence #27-28 in Figure 5.2, the class began a discussion with mutual emotional resonance. With the healing, a positive EE asserted itself. Both the EC valence in Figure 4.1 and the mean change in the EC valence in Figure 4.2 from sequence #29 to # 31 showed that collective effervescence that had been created did not even revert to the negative EE range even after Petra’s “downer” speech. Professor Alexakos’s interjection of the repair ritual replicating
Rose’s speech of reassuring “*today’s topic was too much,*” which had triggered laughter in the class before sequence #30 in *Figure 4.2* contributed to the surge in the positive EC.

Tobin et al. (2013) found that new teachers strengthen group solidarity to maintain positive class EC. They suggest that teachers need to be aware of the moods of individual students and an entire class so that they can shift the direction of the class if it moves toward the direction of negative EE (see also Ritchie et al., 2011; Bellocchi et al., 2013; Hargreaves 2000). “Teacher education programs and textbooks have emphasized the importance of teachers establishing and maintaining control over students. The emphasis on good control/discipline also has been included in accountability models and assessment systems” (Tobin et al., 2013, p. 86). Successful interaction rituals can furnish teachers with confidence and eagerness to replicate the ritual in succeeding classes. Consequently, teachers can improve learning outcomes through stronger teacher student relationships. Also a sociological analysis of interaction in the science classroom may offer teachers and researchers theoretical constructs to help teachers switch interactions and moving EC valence from negative to positive (Ritchie et al., 2011).

As a veteran instructor in teacher preparation classes, Professor Alexakos’ interjection probably resulted from his intuitive grasp of dialogical interaction. His dialogical interaction “invoke[d] the text of another speaker who in turn grounds the argument in other speakers’ utterances— using it as a step to new knowledge” (Ritchie et al., 2011, pp. 746-747)

In addition, Professor Alexakos’ interjection corresponding to Rose’s speech triggered classroom laughter before sequence #30 in *Figure 4.1*. It was not a small contribution to correct and maintain the positive class EE. “[T]he humour, laughter and spirit of camaraderie that was evident in most cases was situated in a larger matrix that allowed all participants to accept what happened as normal and expected—affording their anticipating actions and acting in ways that
were timely and appropriate” (Tobin et al., 2013, p. 83). Demetriou & Wilson’s (2009) research on “new and inexperienced teachers also have highlighted the importance of maintaining a sense of humor in interactions characterized by vibrant positive emotional energy to establish rapport with students” (as cited in Ritchie et al., p. 763, 2011).

These last few minutes of class in week #5 probably were the model of maintaining positive EE/EC. The analysis in this section illustrates the utility of the EC as the guidepost for checking video vignettes, that is, the method used in Chapter 4. Additionally, we can employ the EC as an assessment of how the class was conducted.
CHAPTER 6: CONCLUSIONS, NEXT STEPS, AND AUTHENTICITY CRITERIA

While proceeding with this research, I have pondered my contribution. I believe a researcher’s primary responsibility must be to pay back to society. In this chapter, I will evaluate my research using Guba and Lincoln’s (1989) authenticity criteria.

Applying the methodology of event-oriented social research within a framework of interpretive research (Tobin & Ritchie, 2012), I employ EC data as one of my main data resources. I was aiming to comprehend perspectives on both individual and collective EC such that phenomena of events/interactions occurring in a classroom were interpreted to elucidate “[w]hat is happening here specifically? What do these happenings mean to the people engaged in them?” (Erickson, 1986, p. 124). There remains the potential to discover new methodologies and new data resources in event-oriented phenomenological studies in educational research on emotions. I elaborated and applied new methodologies/analytical processes utilizing EC data with self-reported mechanical devices. In addition to existing methods for measuring collective EC valences, I hope there will be new methodological choices for those continuing emotion researches in classroom/school settings.

It was important to bear in mind what factors are emergent and contingent and to proceed with analyses hermeneutically throughout each chapter and to utilize different methods. For the action and meaning-perspectives of research participants in interpretive research to be explicitly articulated, radically subjective inquiry must be practiced (Erickson, 1986). Utilizing multi-methodology heuristics such as cogen and multi-level analyses to practice radically subjective inquiry helps understand classroom events/interactions more clearly and ontologically. Adopting
diverse methods and multi-level analyses in this research improves classroom practices and curriculum development and the quality of teaching and learning.

6.1 Summary

There are three major analyses executed in this study. In Chapters 3 macro-analyses of the EC data for the entire semester of the BC study were conducted, and the issue entailed in such self-reported EC systems such as overall positive ratings was explicated. In Chapter 4, micro-dialogic/conversation analysis in video/audio recordings of emotional agreement at the moment of ratings was conducted by pin-pointing such moments with meso-EC analyses in a particular week of the EC data. And in Chapter 5, micro-EC analyses at moments of conspicuous ups and downs in EE in the BC study classroom were conducted by identifying such contradictions with meso-video/audio analyses in a particular week. How those events reflect participants’ EC/EE was elucidated.

6.1.1 Summary of Research in Chapter 3

In Chapter 3, it was of paramount importance to establish methodological steps to analyze interpretively and manage issues such as overall positive ratings that were possibly entailed by utilizing the self-reported EC data systems. However, whether researchers accomplish their objective by relying on method alone is questionable. From a constructivist point of view, a method is just one deliberation. Establishing criteria for what constitutes research results is equally imperative in judging a given inquiry (Guba & Lincoln, 1989). Setting
For me, by proceeding with the analyses in Chapter 3, ontological and educative authenticities were achieved with an understanding of probable reasons for the overall positive ratings, which is a consequence of self-reported emotion research. By utilizing multiple methods with the EC analyses, such as heuristic intervention and cogen, research participants can share their thoughts and feelings. Nonverbal participants’ emotional energy may be reflected in the EC data and interpreted through multiple methods, and the phenomena of the probable occurrence of issues in emotion research are tangible enough to be explicated. Additionally, establishing those methodologies can be hermeneutically justified by carefully examining different cases.

### 6.1.2 Summary of Research in Chapters 4 and 5

The methodology used in Chapters 4 and 5 concerning how we employ the EC data was suggested in a series of previous education emotion studies such as Bellocchi et al. (2013) and Tobin et al. (2013). The suggestion of using changes in EC valence in addition to the mean of EC valences to investigate quantitatively how interactions occurred in the classroom and affected individuals’ ECs were expressed in the collective EC as Lottridge’s (2010) emotional majority agreement.

In Chapter 4, both the mean of the EC valence for each 5-minute interval input and the mean of changes in each individual’s EC were calculated, and computing results of both data were visualized as time-series graph representations. Then, the significant peaks and troughs were pinpointed in both EC valence and changes in EC plots. These analyses were followed by
The video/audio analysis of EC, identifying corresponding contradictions that occurred in the classroom.

The new methodology of utilizing changes in EC valences in addition to existing methods of utilizing the mean of EC valence makes it easier to find salient contradictions in the classroom and makes it easier to confirm the meaning of those peaks and troughs found in EC valence plots. In addition, significant extrapolations made in Chapter 4 revealed that EC change can be influenced by the events themselves and styles of utterances or membership in a group.

EC data and analyses of them were not only limited by their use as indicators of salient classroom/school setting interactions, but also in the way that video/audio recording files were used to analyze interactions. The EC data and their analyses in both individual and aggregate cases were then subjected to non-verbal dialogic/conversation analysis and verbal dialogic/conversation analyses with video/audio recordings. In Chapter 5, significant contradictions were identified by the video/audio analysis; then the collective EE of the classroom as reflected in the EC data at the moments of contradictions was examined.

Utilizing standard deviations for EC valence and changes of the EC, as graphed in Chapter 5, participants’ progressive understanding of individual’s sociocultural differences were inferred. In Chapter 5, research participants’ feelings toward the LGBTQ issue were analyzed and no evidence of bias was detected. This is probably because of their position as classroom teachers and role-model educators. The addition of more statistical data resources such as changes in EC valence and standard deviations for polysemic analyses were undoubtedly beneficial to researchers pursuing this series of emotion research in educational environments.

In Chapter 5, Brad’s coming-out speech—achieving his own ontological authenticity criteria—was the controversial nature of gender inequality and discrimination toward sexual
orientation. The research participants in the classroom acknowledged to be aware of society’s injustices rooted in people’s traditional viewpoints and built upon current social structures. During these interactions, participants achieved their educative authenticity criteria, and they met the tactical authenticity criteria of study participants who could empower their action.

Furthermore, participants felt the positive collective EE, a reflection of their classroom EC, during Brad’s presentation. The class’s collective enthusiasm, echoed by a positive EE-filled classroom, encouraged participation in action that illuminated the potential existence of collective action connected to participants’ positive ECs (Sabucedo, Durán, Alzate&Barreto, 2010).

**6.2 Next Steps**

**6.2.1 The Brooklyn College Study and Beyond**

By participating in the BC study, some students in the program altered their ontological stances especially toward the idea of active research, and they became empowered in their everyday routines. After the BC study, Emily was intrigued and strongly influenced by her first exposure to a Ph.D.-level active research-oriented classroom. She was inspired to learn more about research at the Ph.D. level, and the study made her wish to conduct Ph.D. research. Thus, after immersing herself in the research in the BC study, she achieved her ontological authenticity to be more sophisticated (Guba & Lincoln, 1989), started taking the Ph.D. courses, and eventually was accepted in the Ph.D. program at the Graduate Center of the City University of New York.
She also adopted the secular breathing meditation methodology from the BC study and brought it into her teaching classrooms. Her father had been enthusiastic about not-overly-religious breathing meditation practice at home, so the BC study was not her first exposure to breathing meditation. However, it was the first time she had seen practicing breathing meditation in an education environment. Meditation, as a part of cognitive-behavior therapy, can alter patterns of brain activity and strengthen sensitivity toward emotions and physical sensations, improving a sense of health (Davidson & Begley, 2012). Emily now practices breathing meditation with her students in the New York public middle school classes she has been teaching.

The BC study affected another research participant, Vania, who too has begun her doctoral studies. Sheila and Zofia were closely involved in extra research with the BC study team. Subsequently, they published their own research in journal articles. These BC research participants achieved tactical authenticity such that they were empowered to continue education in Ph.D. programs, enact breathing meditation adopted from the BC study in their own classes, and conduct their own research for publication.

6.2.2 Future Emotion Research in Education with Sociocultural Factors

The BC study class consisted of students socioculturally diverse in gender, race/ethnicity, religion, and sexual orientation, and in every week, coteachers/presenters alternatively represented assigned topics such as eugenics, evolution and creationism, or oppression/inequality in social classifications. Because participants were socioculturally unique, it was not surprising
that classroom events included participants with different opinions, which produced disparities in emotional valence.

Assuming that one’s view of self-contained social context treated as an entity is profoundly formed in and, through the detailed lived experiences in one’s specific circumstances of life, and so reflective differences in meaning-perspective will vary with social class position extending the presumption to any other special life situation due to one’s gender or race/ethnicity (Erickson, 1986).

For extended research of EC and interaction rituals, Tobin et al. (2013) suggest further research about the relationships between EC and social classifications of “gender, aptitude, ethnicity, and native language proficiency” (p. 87). To execute such further research, we can analyze research participants’ sociocultural differences in emotional expressiveness reflected on their individual ECs.

The methodology of this research—utilizing descriptive statistics with collective EC data as guideposts to locate events/interactions occurring in the classroom—was constructed by measuring agreement among group member’s ECs. In Chapter 4, peaks and troughs from both the mean EC curves of emotional valence and the mean of changes in the EC valence were first identified as agreements of EC and used to locate contradictions happening in the classroom by video/audio analysis. However, there often were observed disparities in individual positive/negative EC valences or increase/decrease of individual EC ratings with the results of collective EC analyses. Such individual emotional divergences from aggregate EC ratings could result from unique sociocultural backgrounds. It suggests that analysts examine individual differences from the majority of emotion agreement at moments of classroom interaction and
explicate the phenomena by taking into account individual extended factors such as gender and race/ethnicity.

In addition, to execute Tobin et al.’s (2013) suggestion for further research, we would employ the methodology of computing the change in corresponding EC classroom events with a micro-analytic research design. In detail, we first identify conspicuous individual changes in EC, particularly that differ from the majority of EC changes. For example, individual research participants who drastically change their ratings in sequential inputs such as from 2 to 5 or from 4 to 1, especially when those changes differ from changes in aggregate EC ratings, must be identified. Future research should explore the role of race/ethnicity/gender/sociocultural background in explaining divergent individual rating changes. With an ethnographic approach, the dissimilar changes in EC can be identified by discerning such individuals’ facial expressions and body movements in microanalysis of video/audio recordings at the moment of particular divergence in EC change.

When we apply that methodology, we must avoid stereotypical social classifications. As I mentioned in Chapter 2, it is plausible to think that similarities in emotional expressiveness depend on sociocultural backgrounds, for example, the chauvinism in Latin culture mentioned in Chapter 4. However, to investigate relationships between individuals’ EC and their social classifications, ethnographic case studies can be undertaken. Such individual case studies that discern disparities in EC ratings, much as I did analyzing Brad’s case in Chapter 5, are recommended. Because such close analyses may disclose cognitive and behavior patterns they are most suitable in describing such phenomena. Individual case studies promise to increase our knowledge of more complicated learning (Kannan & Miller, 2009).
Employing methodologies that analyze divergences in EC using EC data resource in event-oriented study works particularly well for populations of research participants who prefer nonverbal communications. For some people habit means they either intentionally or unintentionally communicate emotions without utterances. They even avoid displaying their emotions in their facial expression or body-movements because of cultural or religious reasons. Often it is very difficult for those populations to raise their hands and speak up about what they think and feel or simply how they react when contradictions occur in a classroom. It is also not easy to detect and determine what they feel and think just by looking at their facial expression and body-movements. Therefore, a part of multi-data resources, the self-reporting EC data, in this case, is a great data resource for confirming what those participants feel about classroom participation. EC data are resourceful for elucidating how non-verbal communications explain reactions to events occurring in the classrooms.

In addition, we must be careful not to be judgmental in explaining the effect of sociocultural backgrounds on either verbal or non-verbal communications with only one data resource. Just relying on EC data without reference to other data resources is often precarious. Therefore, taking advantage of what I learned while I was proceeding with this dissertation research, I would strongly recommend that EC analyses be conducted on a regular basis while the research participants more vividly remember what events occurred and what EC ratings they input earlier in class so that we can inquire about events during cogen sessions, which are a great data resource since the cogen is essentially a reflexivity tool. Cogen sessions stimulate reflexive thoughts through deep thinking about what really happened in the minds of participants and are used to confirm the outcome of EC analyses. Although I utilize data collected from diverse
research participants in the BC study, I regret that factors such as gender or race/ethnicity and their influence on emotions played a small role in this research.

Educational emotion research that relies on self-reported devices is still relatively new, and there are still a range of possible uses of EC data in event-oriented studies of education.

6.3 At Last

6.3.1 Emotion Barriers and Academic Success

Emotions saturate the landscape of social structure, including group interactions (Sabucedo, Durán, Alzate&Barreto, 2010). In today’s classroom/school environments, it is more difficult for students to learn and teachers to teach, especially when interactions involving strong emotional contradictions occur in such settings. Various studies show that high levels of negative emotions create stressful classroom environments. And once students, at any educational level, are imbued with a negative EE saturated classroom, feelings of resistance may appear and grow in their minds. Consequently, those emotional barriers obstruct both learning and teaching. Then, such contradictions may elicit from individuals, in a sort of downward cycle, negative emotions that affect learning and even wellness.

Although Whitman, Spendlove, and Clark (1984) stated that instructors in higher education working with at-risk students are well aware that emotional barriers can often have negative effect on academic success (Kannan & Miller, 2009), researchers and educators have not been paid much attention to how emotional barriers can obstruct academic success or how
college instructors can respond constructively to emotional barriers in their classrooms. Tobin et al. (2013) urge teachers to react quickly when such changes in EC occur in a classroom.

A positive classroom EE, however, encourages students to be more attentive and evokes their enthusiasm and interest about academic subjects. Kannan and Miller (2009) observed that once students overcame detrimental emotional barriers and their emotional reactions toward academic courses, including related medium and content, they switched from anger and resistance to enthusiasm and participation, and achieved academic success. As we felt the positive collective EE in the class environment in the segment of Brad’s coming-out, reflected in their EC, which was explicated with new descriptive statistical plots, there was a sense of enthusiasm—positive emotions—that illuminated the potential for collective action (Sabucedo, Durán, Alzate & Barreto, 2010).

Furthermore, when asynchrony in classrooms reaches high intensities, the classes typically become dysfunctional (Tobin, 2013). It means that asynchrony is a likely indicator of dysfunction. Similarly, synchrony/entrainment is a necessary condition for being functional. Therefore, I suggest creating synchronous learning environments by mediating each individual’s emotional intensity and increasing mindfulness and awareness in the classroom. For teachers to mediate such asynchronous class environment, it is important to discern physical signals, such as facial expressions, body-movements, or changes in utterances, and to understand emotions so that teachers can quickly mediate negative EE saturated environments (Tobin et al., 2013). Teachers and learners create social structure, and usually such teachers’ enactment of mediation makes teachers and learners dialectically connected.
6.3.2 From Emotional Entrainment to World Transformations

One of the paramount theoretical frameworks embedded in this thesis is Collins’ (2004) theory of interaction ritual chains. Human beings create and interpret various emotional states and build social bonds among them to create sociocultural structures. Increases in human arrays of emotionality strengthen such social solidarity (Turner, 2007). According to Collins (2004), the central mechanisms of interaction rituals take place where a combination of a high degree of intersubjectivity and high degree of emotional entrainment exists. In such cases, social bonds displaying similar EE provide individuals with confidence, passion, and aspirations to improve their emotional states (Collins, 2004).

In local groups or small social structures, student and teacher environments have their own solidarity-maintaining cultures. In such small social structures, compliance with and maintenance of subsumed moral codes/rules, often unwritten, elicit a sense of security and solidarity among people who identify belonging to a particular social structure. Compliance provides feelings of unity with other members from the same environments and strengthens emotional ties (Asahi Online, 10/23/14). Group memberships, after all, “promote the development and maintenance of meaningful interpersonal relationships by offering networks of support and mutual assistance” (Park & Hinsz, 2006, p. 137).

Correll and Park (2005) argued that groups are “often valued and perceived as entities that make a multitude of rewards, resources, and support more readily available, which may help to explain why group membership fosters a sense of strength and self-worth” (Park & Hinsz, 2006, p. 137). On the other hand, alienation, which is an emotional elaboration of disappointment-sadness, anger at a social structure, and fear about the consequences of not
meeting expectations in the structure, converts such negative emotions into a withdrawal response and decreasing willingness to participate in social structures (Turner, 2007).

An interaction ritual theory is crucial to microsociology; microsociology is critical to much larger sociological ideas (Collins, 2004); and, interaction rituals are embedded within association and dissociation of emotional bonds within social structures. One ordinary person’s existence seems to have no effect, in a macro-sense, on what is going on in history. However, regarding Collins’ (2004) interaction ritual chains, the existence of a person or a small interaction in a micro-sense of history certainly affects other people’s life stories and subsequently initiates chain reactions to affect other people’s lives.

Every phenomenon or people’s actions/reactions has meanings. They are the next steps that trigger chain reactions. There is an old Japanese proverb that says “When the wind blows, wooden bucket makers yield a profit” (kaze-ga fukeba okeya-ga moukaru (風が吹けば桶屋が儲かる)). Like a Rube Goldberg machine, synonymous with a scientific notion of the domino or butterfly effect, it refers to early eye doctors who used wooden, water-filled buckets to wash dust out of patients’ eyes. Hence often very trivial first motion/action entail chain reactions, and consequently they induce unexpected results. Collins’ (2004) interaction ritual chains describe individual interactions inducing other actors’ enactments and constructing subsequent interactions (Tobin & Ritchie, 2012). They also alter emotional states or thoughts of self and others in human relationships. When emotion is produced by interacting with others in social structures in which an individual is immersed, such emotions reflexively resonate, and new social interactions are reproduced within social structures. Such established interactions or micro-situations would create and forge another relatively larger EE not limited within the locally situated social structures. EE also can be carried over to further much bigger social
structures, and consequently create further interaction chains or macro-situation since individuals physically resonate such EE recharges subsequent encounters (Collins, 2004). We constantly socialize through interactional experiences, and powerful interaction rituals generate influential EE at the same time (Collins, 2004). Turner adds, “[t]he emotions aroused are constrained by the structure and culture of these meso-level units; and it is through these meso units that the structure and culture of macro-level social reality – that is, institutional domains, stratification systems, societies, and systems of societies – impinge on people in face-to-face interaction” (Turner, 2007, p. 72).

Forsyth (1999) and Moreland (1987) assert that since groups assist members in achieving the individual and shared goals and tasks, and since group members have advantages over individuals in securing positive outcomes and avoiding negative outcomes. It seems natural for humans to wish and look for such group membership and interaction within the groups (Park & Hinsz, 2006). And, it is ideal to expand such group memberships and interactions outside of such locally created social structures to forge much larger social structures with strong emotional entrainments. After all, this is certain since social structure is interconnected with the individual such that “I” is a part of the “other” (Alexakos, 2015).

“The point of our existence is to change and transform the world, which is always a simultaneously individual and collective process and to contribute to the world’s transformation” (Podlucká, PowerPoint slide presentation, February 21, 2015). To achieve such world transformations, conscious individual alterations should be ontological and educative, made among individuals with mutual ambitions to transform the world and a chain reaction empowered by subjective positive EE to establish a solidarity of entrainment as we also transform by interacting with the world (Alexakos, 2015). Then the catalytic expansion of such
emotional entrainment with social bonds from micro- to macro-sociology can contribute to transformations of the world.
Appendix A

And so, for each column of EC valence changes, $\Delta EC$ with the property of sigma notation can be

$$\Delta EC = \frac{1}{n} \sum_{i=1}^{n} EC_{ij} - \frac{1}{n} \sum_{i=1}^{n} EC_{i(j-1)} , j = 1,2,\cdots m$$

$$= \frac{1}{n} \left( \sum_{i=1}^{n} EC_{ij} - \sum_{i=1}^{n} EC_{i(j-1)} \right)$$

$$= \frac{1}{n} \sum_{i=1}^{n} \left( EC_{ij} - EC_{i(j-1)} \right)$$

Where $x$, participants’ EC inputs, $i = 1,2,\cdots n$, number of research participants, $j = 1,2,\cdots m$, number of segments/intervals

This property proves that computing the changes before taking the mean of change of EC valence is equivalent to the Bellocchi’s method of computing increases/decreases of the mean of EC valence.

$$\Delta x = \frac{1}{n} \sum_{i=1}^{n} x_{ij} - \frac{1}{n} \sum_{i=1}^{n} x_{i(j-1)} , j = 1,2,\cdots m$$

$$= \frac{1}{n} \left( \sum_{i=1}^{n} x_{ij} - \sum_{i=1}^{n} x_{i(j-1)} \right)$$

$$= \frac{1}{n} \sum_{i=1}^{n} \left( x_{ij} - x_{i(j-1)} \right)$$
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