# Exploring the relationship between resistance and perspectival understanding in computer-mediated discussions

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Abstract This discourse analytic study explored the interconnection between resistance and 11 perspectival understanding when students negotiated and constructed understandings in 12computer-mediated discussions in a graduate level course on the psychology of learning. 13 Findings showed that resistance expressions often accompanied perspectival understanding as 14 students elaborated on ideas from authors of course readings or peers. Furthermore, perspectival 15understanding was achieved both on the individual level and the group level as students showed 16resistance to the authors of course readings, their peers, and educational issues. These findings 17suggested that resistance played a role as a constructive discourse tool in a collaborative learning 18environment in which students made meaning of scholarly texts. This study is of importance in 19understanding the integral role of resistance in perspectival understanding in computer-mediated 20classroom discussions that has been rarely explored in empirical educational research. 21

 Keywords
 Resistance · Perspectival understanding · Computer-mediated discussion ·
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 Classroom discourse · Learning theory
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# Introduction

Learning in a graduate class encompasses not only acquiring discipline specific knowledge 26 and discourse styles but also developing ways to discern different perspectives and building 27

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one's own perspectives of certain topics or issues in the field (Duff 2012). Considering that 2829graduate students have different expertise and experiences, we presumed that graduate students might experience resistance or conflicts in the course of classroom discussions as they examine 30 and clarify new ideas and perspectives through course readings and discussions. Furthermore, 31the nature of academic conversations in a graduate class encourages students to express 32 resistance to particular ideas to critique and to refine their views. As learners actively engage 33 in learning processes, they encounter intellectual conflicts and challenges in understanding 34new ideas and perspectives, or what we call *resistance* (Chan et al. 1997; Rochelle 1992). 35Therefore, understanding how students express and handle resistance in a learning environ-36 ment can provide insights on how graduate students explore and develop perspectives through 37 discussions. Despite the essential roles of resistance in learning processes to develop perspec-38 tives, questions of how students express resistance in the context of graduate students' 39classroom discourse and how resistance influences their learning have received little attention 40from educational researchers. 41

In examining the relationship between resistance and perspectival understanding, we 42focused our study on computer-mediated discussions (CMD) in which students share their 43 ideas about assigned articles asynchronously on a discussion board. As the democratic nature 44 of CMD allows students to take a risk in expressing their thoughts in a collaborative learning, 45we expected that students may more freely express their resistance to other perspectives. 46 Although previous studies examined how resistance facilitated or impeded knowledge con-47struction in computer-mediated discussions (e.g., Cooper and Selfe 1990; Jordan et al. 2014; 48Lee et al. 2011), there are scant empirical studies that examined how negotiating oppositional 49ideas and collaboratively resolving dissonance in computer-mediated discussions contribute to 50students' perspectival changes. Our goal in this study was to understand how graduate students 51expressed resistance to the ideas from authors of course readings and their peers, and social 52and educational issues as they develop their perspectives and achieve collaborative knowledge 53building. In particular, the focus of this study was to explore how students' resistance is 54displayed in computer-mediated classroom discussions and what relationship the expressed 55resistance has with students' perspectival changes. 56

# **Theoretical framework**

#### Resistance and learning in CMD

Resistance in a learning context is often considered as negative emotions and attitudes such as 59fear, frustration, and the refusal of unknown and unfamiliar concepts, as well as situations 60 when learners find a dissonance between what they expect and what they experience. It is also 61 associated with a lack of motivation, dislike of a teacher or a learning activity, and low self-62efficacy (Brookfield 2006). Thus, resistance may lead to failure of learning. However, learners 63 inherently seek internal cognitive equilibrium or resolve dissonance by contemplating and 64appraising unfamiliar or different ideas in relation to familiar or established ideas (Piaget 651972). Resistance may have the potential for fostering learning or changing current learning 66 environments (Illeris 2004; Torrance 1950). Although strong emotional resistance hinders 67 learning, an individual learner may have more opportunities for meaningful and transformative 68 learning when challenging and being challenged by new points of view that are contradictory 69 to one's own (Holzer 2015). 70

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From this perspective, we view that resistance in a learning context may occur both on 7172individual and social levels sequentially or simultaneously. On the individual level, resistance is defined as intellectual and psychological conflicts that an individual student may experience in 73one's mind (Piaget 1972). Individuals may or may not express their resistance. On the other 74 hand, resistance can be expressed on the social level as multiple ideas or perspectives are 75exchanged and distributed when individuals collaboratively engage in inquiry or learning 76(Anderson et al. 2001; Johnson and Johnson 1985; Matusov 1996). In an interactive and 77 collaborative learning environment in which discourse is used as a tool for negotiating meaning, 78 learners can express their cognitive conflicts and dissonance through disagreement and ques-79tions. Therefore, expressing resistance, as a result of conscious, agentive action, can be 80 productive in that it can show learners' active engagement with contemplating new ideas and 81 developing new knowledge (Illeris 2004). Therefore, expressing resistance is rather the result of 82 conscious, agentive action. Individuals try not only to understand what they are confused about 83 and to resolve the discrepancy between their prior knowledge and new information, but they 84 also make an effort to make changes to what other individuals believe (Huspeck 1993). 85

Although resistance itself has rarely been addressed in research on classroom discussion, 86 many studies about collaborative discourse in a learning context have appreciated the con-87 structive role of the voicing of multiple perspectives to confront or challenge different ideas or 88 views (e.g., Anderson et al. 2001; Clark et al. 2003; Dong et al. 2008; Nussbaum 2011; Stein 89 and Albro 2001). As the nature of meaning is relational, expressing oppositional ideas through 90 collaborative discussion provides a mechanism for converging varied ideas and viewpoints 91(Rochelle 1992). Thus, collaborative argumentation is not aiming to win an argument but to 92explore and critique different ideas or perspectives (Brown and Ranshaw 2000). Classroom 93 discussions become more productive when participants challenge and justify ideas and offer 94 hypotheses, than when they simply accept or refuse ideas (Mercer 1995). 95

Regarding resistance in computer-supported collaborative learning, only a few studies have 96 discussed resistance that students experienced in CMD. Focusing on college students' online 97 writing conferences, Cooper and Selfe (1990) discussed how students challenged traditionally 98imposed roles and positions as they expressed their values and needs with their classmates and the 99 teacher. Expressing resistance through discourses empowered students as active members of 100learning processes. Other studies reported that resistance in a CMD context occurs due to students' 101 lack of familiarity with the medium itself and the challenge of keeping up with the speed of 102conversation. However, CMD can be a comfortable venue for students to take a risk of expressing 103struggles in understanding and disagreement to ideas (e.g., Astleitner 2002; Jordan et al. 2014; 104Schallert et al. 2003, 2004). With respect to resistance phenomena in CMD discourse, Lee et al. 105(2011) identified three kinds of resistance, including content resistance (e.g., to author, to peers, to 106 issues in education), participation resistance (e.g. to being positioned, to tool, and to certain features 107 of discussion context), and meta-resistance (e.g., talking about resistance). Lee et al. (2011) also 108 found students' frequently expressed resistance and its positive influence on their learning in the 109dialogical process of a meaning-making activity. In line with such previous studies, we viewed 110CMD as a valuable context to examine resistance and its relationship with students' learning 111 because CMD can provide a more democratic learning environment. 112

#### Perspectival understanding, discourses, and resistance

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Drawing from sociocultural learning theories, we view learning as an interactive process of 114 constructing knowledge and perspectives by exploring and appropriating social voices 115

(Bakhtin 1981; Bruner 1982; Vygotsky 1978; Wells 1999). Thus, learning also involves not 116 only understanding others' viewpoints but also establishing one's own viewpoints, as well as 117 constructing and understanding new ideas. In understanding advanced graduate students' 118 conceptual growth, we drew on Greeno and van de Sande's (2007) notion of perspectival 119understanding. A framing assumption of perspectival understanding is that the nature of 120cognition is perspectival and thus, the heart of an individual's learning may result in acquiring 121and developing perspectives. Greeno and van de Sande suggested that perspectival under-122standing in a learning context is an inherently dialogic process that involves interactions 123among participants in a particular sociocultural context. Perspectival understanding is also 124situated in social practices in which learners gain and change perspectives as they interact with 125each other and with texts (Bereiter 1994; Cole and Engestrom 1999; Greeno 2006). A 126collaborative learning community in which students engage in discussions on ideas or 127concepts, therefore, is necessary for achieving perspectival understanding (Lave and Wenger 1281991). Although participants may have different perspectives at the beginning of an activity, 129they come to achieve mutual understanding as they co-construct interpretation and analysis of 130concepts (Salomon and Perkins 1998; van de Sande and Greeno 2012). 131

Discourse has an important mediational role in developing, changing, and adjusting 132perspectives (Vygotsky 1978; Wells 2002). Discourse shows a speaker's stance or attitudes 133toward the information itself, the context in which the information is presented, and the ways 134that a speaker presents (Bakhtin 1981; Bruner 1982). Discourse in a learning context is not 135simply a mediator for gaining knowledge and acquiring skills, but it is also a means to express 136one's point of view or positioning in relation to information and to others (Hicks 1995; 137Halliday 1975). Meaning making and negotiation in discourse is relational in that both 138speakers/writers and listeners/readers interact with each other based on their perspectives 139and their understanding of each other's perspectives. 140

The transformative processes of learning or constructing perspectival understanding may 141 inherently involve resistance (Alexander et al. 2009; Chan et al. 1997). Different perspectives 142may result in a lack of understanding among participants, creating conflicts and resistance (van 143de Sande and Greeno 2012). Obtaining a perspective, therefore, involves resolving such 144 misalignment of perspectives that learners face in a particular context (Greeno and van de 145Sande 2007). Examining young children's talk during classroom writing practices, Dyson 146(1987) suggested that tensions arisen in talk were resolved through reconsidering different 147perspectives and (re)examining the appropriateness of ideas. 148

In sum, an individual learner always has a point of view that is shared with others via discourse 149in collaborative interactions in a sociocultural context. Therefore, a result and a process of 150learning involves constructing, modifying, refining, and establishing a viewpoint of a concept. 151Not only does learning change individuals' perspectives, but it also transforms those established 152in the community. Therefore, we view learning as active social inquiry and sense making, leading 153to bidirectional conceptual changes between individual learners and the learning community of 154practice. Perspectival understanding as learning involves understanding others' perspectives and 155developing points of view on what one reads and experiences, and thus can go beyond 156understanding the meaning of texts or concepts. We assumed that resistance may play a positive 157role as a psychological and interlocutory tool in making students' perspectives enriched and 158contributing to collaborative knowledge growth and examined the relationship between resis-159tance and perspectival understanding. The following research questions guided this study: (a) 160How did resistance and perspectival understanding occur in CMD? And, (b) How did students' 161resistance influence perspectival understanding in CMD? 162

## Method

#### **Participants and context**

This case study focused on a graduate-level learning psychology course offered by the 165Educational Psychology department in a large university in the Southwestern United States. 166The focal class consisted of 18 graduate students (13 females and 5 males), their instructor, and 167their teaching assistant (the first author). The students came from different disciplinary areas in 168education. The focal class addressed various topics related to learning theories across 12 face-169to-face meetings and three asynchronous discussions. For each online discussion, the teacher 170assigned the students to three groups of 6 members, changing membership for each session. 171During the online discussion session, the class did not hold a face-to-face meeting and the 172discussion board was open for 36 h. The students were expected to read two or three assigned 173articles for each discussion session and to post at least three messages either to initiate threads 174or to respond. However, many students posted more than the required number of messages as 175they actively exchanged ideas. The instructor often initiated a thread for each article by giving 176some elapsed time between threads. The instructor's initiating message included general 177comments or questions such as "What did you think of their research question, first of all, 178and of their results, secondly?" 179

#### Data sources and data analysis

Data sources included written transcripts of three asynchronous discussion sessions (hereafter, 181 referred as Discussions 1, 2, and 3) from three groups (9 transcripts in total; hereafter, referred 182 as Groups 1, 2, 3) and surveys conducted before and after every discussion session. The 183surveys asked about the degree to which students understood each assigned reading before and 184after the discussion and the degree to which students experienced resistance to discussion and 185to the assigned course reading. There were 24 threads in total: the first and second sessions 186have three threads (hereafter, referred to with the author of a focal article; e.g., Mason et al. 187 (2008) thread) respectively, and the last discussion session has two threads in each group. 188Students' survey responses were used as supplemental data to select sample thread discussion 189transcripts for developing our coding schemes and validating our analysis. 190

Data analysis was iterative and inductive as we constantly compared and contrasted 191instances and counter-examples throughout three phases (Corbin and Strauss 2014; Lincoln 192193and Guba 1985). In analyzing the data, the first author, who had assisted the course, provided insights in understanding the course contexts, whereas the second author provided perspectives 194as an outsider. In Phase 1, we read the transcripts to determine chronological and semantic 195interconnections among messages in each thread by creating a coherence graph (see Fig. 1). 196Reviewing the surveys to understand how students experienced resistance in different discus-197sion sessions, we chose a topic that students reported having experienced resistance most 198during the discussion. By focusing on that particular discussion session, we analyzed the 199transcripts of the threads from three groups. In analyzing resistance expressed in each message, 200we adopted the coding schemes that we had developed in Lee et al.'s (2011) study. Instead of 201using all coding schemes, we decided to use only content-related resistance codes including 202resistance to author(s)' idea (R1), resistance to peers' idea (R2), and resistance to an educa-203tional issue (R3) because we recognized that the other types of resistance (e.g., resistance to 204being positioned, resistance to tools, and meta resistance) were less related to students' 205

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Fig. 1 An example of a coherence graph



construction of knowledge and perspectives. Along with these three types of resistance from 206our previous study, we further developed four kinds of non-resistance as shown in Table 1. 207

In this study, we also developed the following five constructs in order to analyze in detail 208how resistance was expressed and functioned in each discussion: (a) to what resistance was 209expressed (e.g., the author of an assigned article, a peer's idea, social issues); (b) the result of 210resisting (e.g., agreeing or disagreeing to a colleague, etc.); (c) the focal idea to which the 211message expressed resistance; (d) extended ideas; and (e) the result of extending ideas. By 212using a chart, we noted on each of these constructs for each message (See Table 2). 213

In Phase 2, we began by defining perspectival understanding as new or extended ideas that 214add an extra dimension to the ideas from course readings and peers' messages. We then 215focused on whether each message in a discussion included extended ideas or new perspectives 216and how those messages were related to students' understandings about assigned readings or 217peers' ideas. We developed two types of messages representing perspectival understanding 218(See Table 1): (a) providing a perspective to the author's ideas (PUa); and (b) Providing a 219

Code		Description	Example
Resistance messages	R1	Resistance to the author	Readily admitted by the authors, this sample lacked diversity in terms of race, ethnicity, and gender (Bridget)
	R2	Resistance to colleagues	I believe you may be right, that we may new truly adopt the full perspective of someon- from a collectivist culture because we are already socialized into our own, but does that mean we should not try? (Jake)
	R3	Resistance to educational social issues	Given the educational crisis in American schools, we must question why we stick with traditional methods of operating rather than instituting innovative strategies to improve the academic standing of our citizens (Stephen)
Non Resistance messages	NR1	Providing an example relevant to the author's or a peer's idea	So if we are thinking about the light example may have come into the class with a very simple representation of scientific knowled one that might be characterized as less advanced (Daisy)
	NR2	Expressing appreciation about the author's or a peer's idea	Emily, I think you raise an important point. tune out in certain circumstances seems necessary for effective attending, listening and further cognition regarding the subject at hand (Betsy)
	NR3	Suggesting a new idea	So it seems like it might be possible that something such as the source of these emotions being found could vary from culture to culture thus impacting what they might mean to the child or how a teacher could work with around it. (Sally)
	NR4	Providing an answer to a question from a previous message	I think he meant to say problem reduction. Problem reduction is at the other end of the continuum of progressive problem solving (Donna)
Perspectival understanding	PUa	Providing an alternative perspective to the ideas from the author(s) of the assigned article	However, even if we did come from the sam culture, it is still very difficult to fully gra on author's intended meaning. I would the that current grad student in Russia may al misinterpret some of Vygotsky's works (Cecil)
	PUb	Providing an alternative perspective to a peer's idea.	[Responding to Jake] Kids can feel very different about each class they are in. I th it is completely possible that kids could fe happy often at school, such as when they in athletics or some elective class, but tha also feel very angry when they are in a m challenging class (Kassie)

perspective to the others' ideas (PUb). The messages that showed appreciation or confirmation 220 of ideas from the authors or peers were coded as 'no perspectival understanding (NPU)'. We 221individually coded each resistance and nonresistance message again with perspectival 222

		Codes	RIPUa		R3NPU	NR3	RIPUa	RIPUa	R2NPU	
		Agreeing or resistance to whom with extended ideas	Confirming her previous	message(#6) & Agreeing to Steve(#2)		Agreeing to Daisy's comment (#9)	Agreeing to Stephen	Agreeing to Bridget		
		Extended ideas	providing an example (Light example)			Effectiveness of certain persuasion strategies (e.g., political campaign)	Application of refutational texts in other subject areas	The process of flexibility in knowledge construction	0	5
		Focal ideas in resistance message	Change in belief about knowledge	2	Whether or not refutational text has been used in social sciences domains	intentionality in knowledge revision & persuasion in everyday life	Use of refutational texts in classrooms	too much emphasis on knowledge malleability in the article	EB is different from knowledge level	
5	ission thread	Result of resistance	Elaborating what she meant		Raising a question		Elaborating & Agreeing to Stephen	Agreeing to Bridget	disagree to Bridget	
-	a chart of analyzing a discu	Resistance to what	The author of Article & being positioned		Application issue in various domains	No resistance	The author of article	The author of article	Peer's understanding	
ہ -	mple of a	To M#	7		~	6	10	4	4	
	2 An exa	Writer	Daisy		Stephen	Laura	Bridget	Laura	Soojung	
Ē	Table	, #W	6		10	11	12	13	14	
🖄 Springer	t2.1	t2.2	t2.3		t2.4	t2.5	t2.6	t2.7	t2.8	

understanding by combining the coding schemes (e.g., R1PUa, R2PUb, R3NPU, NR1PUb,223etc.). During our meeting, we compared our coding, and the inter-rater reliability ranged224between 90 and 100 %. We discussed any examples that we disagreed to reach the consensus225on those cases.226

In Phase 3, by reviewing the analytic charts, we explored whether or not resistance 227 accompanied perspectival understanding in each message and whether or not non-resistance 228did. We first counted instances how often messages with resistance or without resistance co-229occurred with perspectival understanding. Then, we reviewed the counts to look for patterns of 230the relationships between resistance and perspectival understanding in each thread. 231Furthermore, using a constant comparative approach (Corbin and Strauss 2014), we made 232 notes on how expressing resistance influenced perspectival understanding by reviewing the 233 analytic chart and transcript of each thread. Confirming and disconfirming the cases, we 234developed hypotheses and tested them with examples and counterexamples to refine our 235themes. 236

# Findings

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In order to show the overall co-occurrence of resistance and perspectival understanding, we 238start this section by presenting the findings of descriptive statistics. As shown in Table 3, 239resistance and perspectival understanding were more likely than not to co-occur: 75.8 % of the 240resistance messages showed perspectival understanding whereas 36.5 % of the non-resistance 241messages did. The co-occurrence of resistance and perspectival understanding was prevalent 242across three discussion sessions, representing respectively 79.2 % in Discussion 1, 56.7 % in 243Discussion 2, and 89.2 % in Discussion 3. Overall, when students expressed resistance, it was 244more likely for them to achieve perspectival understanding. 245

### Influence of one's resistance on his/her perspectival understanding

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First, our analysis showed that individuals achieved perspectival changes when they acknowledged different views and considered ideas different from their original perspectives. 248 Resistance expressed in one's original message invited others to deliberate ideas, and others' 249

	Total # of messages		# of messages	# of messages with perspectival understanding.
Discussion 1	97	With resistance	24	19 (79.2 %)
		Without resistance	73	29 (39.7 %)
Discussion 2	99	With resistance	30	17 (56.7 %)
		Without resistance	69	31 (44.9 %)
Discussion 3	103	With resistance	37	33 (89.2 %)
		Without resistance	66	16 (24.2 %)
Total	299	With resistance	91	69 (75.8 %)
		Without resistance	208	76 (36.5 %)

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responses expressing resistance eventually contribute to individuals' perspectival changes. 250One representative example came from Jason when he participated in a sub-thread of the 251discussion on Ageyev (2003) that discussed how American researchers misinterpreted 252Vygotsky's perspectives of sociocultural aspects in learning. In this particular thread, more 253resistance messages were found than non-resistance ones (21 vs. 12) and all resistance 254messages but one accompanied perspectival understanding. The sub-thread in which Jason's 255perspectival understanding took place is shown in Table 4. Please note that we underlined a 256part that shows resistance in each message and indicated a coding for each message in in the 257right column. 258

In this sub-thread, students used resistance not only to critique different perspectives but 259 also to explore and suggest alternative perspectives. Our analysis showed that Jason's resistance to the instructor's view of Ageyev's criticism facilitated further discussions that 261

Students' messages		To #M	Code ( <u>content</u> )
Donna (#1): I always find him a little preachy at the beginning did he irrit you too with his preaching to us about how we may have misinterpreted Vygotsky? It's almost ironic that someone who is writing about how every interpretation has to be saturated with one's cultural history would then be acting a little huffy about how we AMERICANS have misportayed his he	ate		R1NPU
Jason (#2): Well, I did find him just a little preachy, and ironically his interpretation is probably full of his own cultural beliefsI felt a little like we were American bashing but I think the is trying to bring about a correct view through providing informationI am not sure someone can fully grasp the meaning and nuances of a foreign culture to the 100 % levelI don't think we can transform individualistic based learners to operate as collectivist learners		#1	R1PUa
Donna (#4): I really like it that you defended Ageyev, Jason,You are so rig about how difficult it is to enter into another's cultural perspective. But, th doesn't mean we don't gain something for TRYING to do that!	ght nat	#2	R2PUb
Brenda (#5): I really, really appreciated - among other things - Ageyev's ubiquitous reminders of the importance of contextbut I feel frustrated t he didn't acknowledge that many Americans - certainly graduate students! may have the capacity for more high-context communication that decrease "intercultural misunderstandings" and "culture clashes."	that - es	#4	R1PUb
Emily (#6): I agree, especially with the criticism that Ageyev is over-general and suggesting that American students, through certain characteristics, all Vygotsky's theories difficult to understand, <u>I think this is in many ways do</u> what he preaches against, and not taking context into account.	izing find ping	#5	R1PUa
Stephen (#7): I believe he is arguing that we should not cherry-pick the portion of a theory that fit with our individualistic approach, while discarding the more important, parts that fail to fit nicely into our worldview.	ions other,	#6	R2PUa
Stephen (#8): I believe American students, even graduate students, would fin difficult to fully understand the messages from individuals raised in a high context environmentI, personally, do not accept the notion that one ca understand a culture without immersing one's self into it.	<u>id it</u> 1- an	#5	R2PUa
Jason(#9): Stephen, I agree that he is trying to dissuade cherry picking. On the other hand - it will be hard for people without the target worldview to con- understand that worldviewI assume that the semantic and cultural membedded within a technique can be learned, but I don't think this is a natisimple process.	he npletely eaning tural or	#7	R2PUb

t4.1 Table 4 An example of interconnected postings showing an individual's conceptual growth

eventually led to Jason's perspectival understanding. As the first response to the instructor's 262initiating post expressing resistance to Ageyev's ironical criticism on American scholars' 263interpretation of Vygotsky, Jason expressed his resistance to the idea of understanding subtle 264meaning embedded in another culture as shown in his comments (#2). As indicated in his 265comments such as "I am not sure ... " and "I don't think ...," Jason expressed rather strong 266resistance to the idea that American scholars could "fully" understand the embedded meanings 267of Vygotsky's perspectives on human learning. Thus he defended Ageyev's claim, stating: "I 268don't think Ageyev is pushing us in the direction of collectivism acculturation and abandon-269ment of individualism." 270

The rest of the thread consisted of contrasting views about Agevev's criticism as the 271participants expressed resistance to the focal course reading and to each other's ideas. Such 272oppositional views expressed in others' messages influenced Jason's perspectival changes. 273274Responding to Jason, Donna (#3), the teacher, also expressed her resistance to Jason's idea by suggesting an alternative idea that "trying" is important in understanding "another's cultural 275perspectives." Furthermore, aligning with Donna's view, both Brenda (#5) and Emily (#6) 276provided perspectives that a certain cultural perspectives can be understood as they showed 277resistance to Ageyev's view. Brenda provided "Americans' ... capacity" to understand "high-278context communication" and Emily "melting pot" as alternative ideas. However, Stephen (#9, 27910), like Jason, defended Ageyev by expressing resistance to Brenda's and Emily's views. In a 280way, Stephen's perspective was very similar to Jason's (#2) original perspective, but Jason did 281not completely agree with Stephen. Instead, he suggested an assumption that "semantic and 282*cultural meaning... can be learned*', which was similar to the perspectives of the instructor, 283Brenda, and Emily. Thus, Jason started to embrace a different perspective from his original 284view, recognizing the possibility that despite challenges that they may experience, individuals 285from another culture can understand culturally embedded meaning through learning as shown 286in his later messages (#9). He further softened his assertion and proposed an idea that learning 287languages is primarily helpful to learn other cultures in his later message (#10). Both of Jason's 288messages showed how an individual's perspectival change can be induced by social interaction 289as he shifted his perspective and expanded his understanding about an article. Conclusively, an 290individual's resistance to the author's or peers' ideas allowed other classmates to entertain and 291deepen the ideas, which resulted in sophisticating one's stance toward the ideas and embracing 292a different perspective. Participants' contrasting views, as shown in this particular thread, 293facilitated individuals' perspectival changes. 294

# Facilitating groups' perspectival understanding through resistance

Whereas our first theme showed individuals' perspectival understanding, our second theme296showed that students as a group achieved perspectival understanding as a result of participating297in a discussion. As students expressed resistance to the ideas from assigned readings and their298classmates, they further explored different perspectives by suggesting ideas implied in course299readings, shifting from resistance about one issue to resistance about a new issue, or taking up300a new idea or a perspective that connected to the article.301

An example came when Emily (#6) expressed resistance to Ageyev's view by suggesting 302 two different ideas: (a) America as a melting pot; and (b) the issue of traditional hegemonic 303 masculine norms in American academics. Our analysis indicated that Emily's two different 304 ideas, derived from her resistance to Ageyev, further facilitated a group's perspectival changes, 305 by generating two different trajectories of discussion as shown in Table 5. 306

t5.1

### Table 5 An example of interconnected postings showing the group's conceptual growth

Students' messages	To #M	Code ( <u>content</u> )
Emily (#6) America is supposedly a melting pot, with a variety of different individuals who do not subscribe equally to America's rugged individualism, and that should be taken into account as well My first thought when I rea those norms was that they are all traditional hegemonic masculine norms in America - and that most of the people in the field who had prestige and who passed down these ideas to others were men Would american psychologis have been more open to the collectivist/interdependent theories if there had been more prominent women in the field then?	#5 d	R1PUa
Stephen (#11): I am unsure this would have dramatically altered the course of history since women who would have received training at this point would have had attitudes that were akin to their teachers. I have wondered about the role of power in determining the construction of the social space. Possessing the ability to impose one group's reality onto another group is one way that power has been defined. Ageyev alludes to the role of power when discussing how Vygotsky tailored his work to avoid the scrutiny of those in charge, I wonder if his work would have been different if he had not been under this pressure	#6	R2PUa
Jake (#12): Emily's point about the melting pot is well taken, and <u>I can't</u> believe Ageyev doesn't even acknowledge that this country is more than the Caucasian culture. Yes it may still be the culture in power, but one cannot deny that this power is continuously under siege and there are many reasons to believe that it is unsustainable	#6, 11	R2PUb
Stephen (#16): I believe he [Ageyev] is arguing that we are unwilling to take the time and effort to understand the historical significance of particular phenomenon from other cultures I wouldn't disagree with your assessment that the "Whiteness as norm" is unsustainable. I, however, do not underestimate that forces that work to maintain the status quo	#12	R2PUb
Emily (#17): I wish that idea [the idea of power] had been more important to the author. Obviously learners are active agents who don't just take in knowledge passively But the power that is inherent in such an interaction as Ageyev may hit at but does not directly address, most be one of the most important areas to focus on in discussing how Vygotsky is "taken in"	#11	R1PUa
Brittney (#18): I guess what I meant was that a little information on the contest could help bridge the gap Do y'all think that-as Jake and Emily touched on-the melting potness of American lends itself to our being more able to grasp the subtleties of a culture that is very different from our own?	#12	R1PUb
Bridget (#21): So, did Ageyev mean that we are conscious in our decision to pick and choose our interpretations in a way that sustains our individualism? I would like to think that he would see our interpretations and patterns of understanding as being the result of many contextual factors	#16	R2PUa
Jason (#25): Brittney, I really like your question I think of it as many American know THAT Myslims celebrate Ramadan, but I don't know if the same number know more about the same festivityso this was a long and convoluted way of answering your question with my opinionated NO-I don't think we (as a nation) seek out subtleties within culture.	#18	R3PUa
Jake (#26): I am not sure that Ageyev necessarily meant mean that we are conscious in our decision to pick and choose our interpretations in a way that sustains our individualismAgeyev's sweeping generalizations about the fixedness of American thinking may very well seem more quaint and misinformed with the passage of time	#21	R2PUb

The participants in the focal sub-thread contemplated the two ideas that Emily suggested in 307 subsequent messages, using them to think critically about Ageyev's perspective on American 308 graduate students' misinterpretation of Vygotsky. First, the idea of a melting pot was further 309 discussed by Jake (#12), Brittany (#18), and Jason (#25). Jake supported Emily's perspective 310that American culture has diversity and Ageyev may ignore it whereas Brittany and Jason 311 resisted Emily's perspective. Thus, Jake showed showed resistance to Ageyev whereas 312Brittany and Jason defended Ageyev. In doing so, each further added a different perspective. 313 Jake implied that Caucasian culture might have had power in American culture, but power 314would be constantly changing. Brittney invited others to think about the benefit of "melting 315potness of America" in understanding other cultures. Responding to Brittney's question, Jason 316 expressed some doubt on Americans' appreciation of unique characteristics of other cultures 317 with an example of Muslim culture that was not fully understood by Americans. Thus, as 318 students expressed resistance, they explored Emily's perspectives from different angles to 319extend their understanding about cultural and contextual importance in text interpretation as 320 321 implied in Agevev's article.

Emily's second idea about power hegemony in academic worlds was also further discussed 322 by another group of classmates, and Emily's idea provided other students in this particular subthread on power issues with an opportunity to complicate and expand the idea collaboratively 324 as they expressed resistance. Emily's hypothetical question provided another perspective of 325 understanding Ageyev's point of view. Stephen expressed resistance to Emily's idea as he provided a different perspective of power issues in interpretation of certain ideas. 327

After Stephen's message, students further discussed whether or not the power is changed 328 (see Jake's #12 & Stephen's #16) and what it would have meant to Ageyev (see Emily's #17, 329Bridget's #21, & Jake's #26). Jake (#12) and Stephen (#16) further discussed a nature of 330 power, expressing resistance to each other's ideas. Emily (#17) again pointed out that Ageyev 331 did not stress enough the issue of power in academe, resisting to Stephen (#11) who mentioned 332 that power issues were implied in Ageyev's article. Furthermore, as Bridget (#21) expressed 333 resistance to Stephen (#16), she provided an alternate way of interpreting Ageyev suggesting 334that Ageyev could have considered "contextual factors" rather than individualism alone. 335 Furthermore, expressing resistance to Bridget's perspective, Jake (#26) provided his view on 336 337 why Ageyev's perspective was not welcome.

Overall, in this particular sub-thread, resistance facilitated participants' exploration of 338 different perspectives. An individual's resistance message with a new idea evoked other 339 participants' collaborative efforts to validate the idea, which resulted in enriching the discus-340sion and deepening and broadening the group's understandings about the article. In sum, 341 students sophisticated and elaborated their perspectives by discussing the ideas raised in 342 others' resistance message and by expressing resistance to those ideas. This dialogic work 343 led to mutual understandings of perspectives from assigned readings and other classmates 344 beyond individuals' intellectual capability. 345

### Snowball effect of perspectival understanding elicited by resistance

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One significant phenomenon emerging from our analysis was that resistance messages created 347 more messages accompanying perspectival understanding. Considering the existence of all kinds of speech acts (e.g., uncertainty, politeness, appreciation, etc.) in CMD discussions, we 349 postulated that the higher frequency of resistance messages including perspectival understanding might imply that students who expressed resistance in their messages were willing to 351 consider different points of view and to extend the ideas further in a collaborative discourse. In352particular, a resistance message addressed at the beginning of a thread or a sub-topic thread353often contributed to evoking perspectival understanding in the subsequent messages with or354without resistance.355

Once a resistance message was posted, students seemed to feel free to express resistance to 356 previous messages in which, according to survey responses, they were not always initially 357 comfortable with expressing their resistance. That is, once a resistance message with perspec-358tival understanding emerges in a discussion, it tends to spread to other participants and occur 359with increasing frequency. Despite their hesitance to express resistance, students employed 360 resistance intentionally to make the conversation proceed and to experiment with their 361 thoughts, as Kassie indicated: "Thanks for clarifying, just you know I wasn't trying to attack 362 you, I was just trying to keep the conversation going....". As advanced graduate students who 363 recognized when and how to compromise with others in discussion, they entertained and 364negotiated different ideas and perspectives through exchanging resistance messages with each 365 other, leading to deepen their understandings about assigned articles. 366

For example, in Group 2's Do and Schallert (2004) thread in Discussion 1, Steve (#9) 367 expressed resistance to the article by indicating that the authors might have had different 368 findings if ethnically and linguistically diverse groups were included. Although his message 369 was posted close to the midpoint of the thread, his comment as the first one initiating a sub-370 topic thread contributed to the development of the focal thread, creating the longest sub-thread. 371Eight of nine messages (approximately 29 % of total messages of the thread) responding 372directly or indirectly to Steve's message showed perspectival understanding, and five 373 expressed resistance. This case illustrated how a resistance message was not isolated, but 374connected other messages, stirring up the repetition of resistance and perspectival 375understanding. 376

However, not all of the resistance messages at the beginning of a thread or a sub-topic 377 thread were able to contribute to further messages with perspectival understanding. Such 378 resistance messages were likely to be treated as writers' misunderstandings of concepts rather 379than as critical views. In Group 1's Moje and Lewis (2007) thread in Discussion 3, for 380 example, Brenda showed her resistance toward the authors as follows: "I am uncomfortable 381with the in-depth interpretation of the exchange, considering that the researchers didn't speak 382 to the students afterwards regarding their comments." Donna provided an explanation on 383 Moje and Lewis' intention to use detailed interpretation of the data, treating Brenda's 384resistance as a simple inquiry: "I wanted to mention that ... they're trying to propose a different 385way of analyzing data and they're giving us an illustrative case with that one little conversa-386 tion." Although Jason agreed with Brenda's perspective, the other messages after Donna did 387 not discuss the idea to which Brenda expressed resistance, seemingly accepting Donna's 388 response as an answer to Brenda's inquiry. 389

Although perspectival understanding frequently co-occurred with resistance messages, we 390noticed that there were some cases in which non-resistance messages also accompanied 391perspectival understanding. Two threads were particularly noteworthy because they provided 392counter-examples. First, Group 3's Alexander and Murphy (1998) thread in Discussion 2 had 393 only non-resistance messages, more than half of which were coded as reflecting perspectival 394understanding. Interestingly, the authors of the focal article expressed resistance to their own 395research findings. Agreeing to the authors' resistance, the students suggested new ideas that 396 were considered as representing perspectival understanding as Brenda stated: "I think the 397 population considered in this study explains in part the perplexing results...." These non-398 resistance responses inherently conveyed students' resistance to the study of the article 399 entertaining different perspectives about research design. Second, in Group 1's Bereiter and 400Scardamalia's (1993) thread in Discussion 2 non-resistance messages more accompanied 401 402 perspectival understanding than resistance messages; 11 out of 19 non-resistant messages were coded as perspectival understanding (57.9 %), whereas three of seven resistant messages 403accompanied perspectival understanding (42.9%). In this particular thread, the group members 404from a school counseling program actively exchanged their perspectives derived from their 405own counseling experience without showing resistance. These non-resistance messages in-406cluded practical experiences and ideas that aroused sympathy from a specific group of people. 407

In sum, students' resistance contributed to developing and modifying their perspectives 408 when it allowed others to deliberate ideas and perspectives. However, resistance messages 409 considered as seeking an answer did not elicit further messages with perspectival understanding. The nature of resistance or how a resistance message is interpreted influenced the development of perspectival understanding. 412

## Discussion

The intersection of resistance and perspectival understanding in our findings illustrated how 414 graduate students learned from each other and the authors of articles, in particular, through 415taking and elaborating perspectives in CMD discussions. The findings of this study suggested 416 that the resistance messages produced opportunities to contemplate certain ideas from various 417 angles and to consider new ideas more productively. We expected graduate students, as a 418 group of advanced learners, to be less reluctant to express resistance and to be more open to 419different ideas or perspectives during discussions than younger learners. Results were consis-420tent with this hypothesis. The participants in this study even used resistance as a strategy for 421 continuing the discussion and increasing their own and class members' understanding of 422 423 course-related readings. Expressing resistance was associated with learning as perspective taking and perspectival changes in our data because it enabled students to wonder about a 424 425concept, revisit their own interpretation or past experiences, to conduct thought experiments, 426 and to willingly take up a new idea as they collaborated in classroom CMD. This study also confirmed the snowball effect of resistance messages with perspectival understanding. Early 427 428 occurrences of resistance messages had a greater influence on the likelihood of later occurrences during discussions, which showed social influence in dialogic learning processes. 429

Our findings aligned with Bakhtin's (1981) idea that resistance is the necessary counter-430point to accommodation in dynamic social systems because it makes individuals identify their 431needs or values and raises the possibility of change in social systems. We found that resistance 432in discourse that we focused on here plays a similar role of initiating perspectival changes as 433 students interacted with their teacher and academic peers in classroom CMD. Results of this 434study underscored the positive role of resistance in learning. Supporting the assertions of 435previous studies (Holzer 2015; Illeris 2004; 2007; Torrance 1950), our findings particularly 436called attention to how learners express resistance as they interact in online discussions. While 437teachers mostly take the initiative of interaction and an evaluative power in traditional 438discourse forms, the primary source of interaction in computer supported collaborative 439learning (CSCL) environments comes from students as academic peers (Jordan et al. 2014). 440 Through expressing resistance, students gained authority as members of academic forums and 441 initiate change (Cooper and Selfe 1990). As Holzer (2015) indicated, resistance with a critical 442

view or suggestion of a new idea shown in students' discussions played a role in making the 443 discussion productive and transformative, facilitating individuals' or groups' perspectival 444 understanding rather than simply expressing opposition or rejection. 445

As shown in our findings, early occurrences of student resistance and teacher support for 446 resistance in classroom CMD had the benefits of continuing the discussion and of becoming 447 productive by creating what Holzer's (2015) called, *differential space* where differences 448 between perspectives are valued and refined. Also, Expressing resistance in discourse and 449providing reasons why students are resistant to certain ideas imply that individuals have 450interests in the topics and are willing to participate in a learning activity (Anderson et al. 451 2001; Lee et al. 2011). Although acknowledging the value and utility of ideas is still an 452important aspect of learning, we view resistance as one of the constructive and critical 453discourse tools that facilitate changes in perspectives and expand understanding of complex 454 concepts. 455

In relation to the notion of perspectival understanding, our findings aligned with previous 456 457 studies in that students explored and developed different perspectives as they participated in discussions (Greeno and van de Sande 2007). As students interpreted and analyzed various 458 perspectives, they changed, refined, and adjusted their earlier perspectives (van de Sande and 459Greeno 2012). Expressing resistance to different perspectives was in fact an integral part of the 460 focal graduate students' learning processes as they explored various ideas and perspectives that 461 conflicted with their previous perspectives and that they struggled to understand (Alexander 462et al. 2009; Chan et al. 1997). Through expressing resistance in such constructive ways, 463students share their perspectives with others, and readjust their conceptions (Huspeck 1993) 464while establishing mutual understanding by re-examining their own and others' perspectives 465466 (Dyson 1987).

467 We acknowledge that this study has some limitations. First, as this study focused on one graduate class in a particular disciplinary area, the generalizability of the findings to different 468disciplinary areas is limited. Although our findings captured individual students' perspectival 469understanding occurring and changing, we could not follow up with how individual students 470developed their perspectives of certain topics over the course of the class. This was partly due 471 to the nature of the focal class in which a new topic was discussed each week, as in many other 472graduate classes. We also recognize that asynchronous discussion is limited in examining 473students' resistance expressed in moment-to-moment, immediate responses, although students' 474elongated comments provided us with ample evidence of students' extensive reasoning on 475their resistance and their thought experiments with potential ideas. Therefore, future studies 476 can examine a learning context in which a certain topic is explored over an extended time 477 period to understand how students' initial resistance to, and perspectives of, certain aspects of 478 the topic change throughout their courses of learning. Furthermore, a study on how students' 479perspectives change or how students achieve perspectives can examine synchronous or face-480 to-face discussions to understand how moment-to-moment interactions influence students' 481perspectival understanding. To strengthen understanding of the role of resistance in learning as 482perspectival understanding, it may be useful to contrast the occurrence of resistance expres-483sions with the occurrence of non-resistance expressions in CMD or to conduct a study on 484 different groups of learners such as undergraduate students or younger students in different 485disciplinary areas. 486

Findings of this study offer several insights that can be considered when instructors design 487 their classes using CMD to explore various perspectives prominent in the course readings. 488 First, expressing resistance to certain ideas or perspectives is an essential part of learning 489

processes in which students understand a concept and develop new perspectives about it 490through dialogic social interactions. In CMD, it is imperative to encourage and support 491students' expression of resistance in a constructive way by allowing them to elaborate on 492why they feel resistant to certain perspectives and ideas. From our findings, expressing 493resistance in discourse facilitates one's conceptual changes as it allows one to experiment 494not only with her/his perspectives, but also with other ideas. Additionally, the findings of this 495study emphasize a view of learning as a collaborative and collective process as well as an 496individual process. This view encourages instructors to acknowledge that students as a group 497can achieve changes in perspectives even though individual perspectival changes may not be 498apparent. Acknowledging that knowledge is distributed and that learning involves gaining 499perspectives, instructors can consider and develop ways to promote collaborative learning and 500can assess what and how student groups can collectively achieve in learning contexts. 501

Notes Contributions of the two authors to this article were equal. We rotate order of authorship in our writing. 502**03** 

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