Essential Motivational Group Dynamics: A 3-Year Panel Study

Yoshifumi Fukada, Tim Murphey, Joseph Falout, and Tetsuya Fukuda

Abstract Using the lens of Dynamic Systems Theory (DST) we look at longitudinal survey results over a 3-year period for EFL students at Japanese universities. This panel study measured motivational changes across single semesters, using multiple measures. Our surveys contain questions to investigate what we call Present Communities of Imagining (PCOIz), which is an actively sharing and imagining classroom community, within which each individual's three notional mind-time frames of English-learning motivation interact among themselves and among those of others inside the classroom. These mind-time frames are the antecedent conditions of the learners, present investments inside and outside of class, and possible future selves.

Our teaching methods involve highly interactive activities that address the three mind-time frames explicitly, and we regularly return students' information back to them through the process called critical participatory looping. We find that the dynamic system of interacting attractors of the three mind-time frames of motivation becomes more positive over time, given good group dynamics, and that the students' motivations tend to resonate and harmonize with each other the longer they are together. These results seem to support our hypothesis that returning self-information back to students creates healthier Socially Intelligent Dynamic Systems (SINDYS) within the classroom.

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1 Introduction

Many teachers intuitively know in practice what researchers in educational psychology are just beginning to understand in theory – student motivation is dynamic. Each student's motivation is a complex and dynamic system, and each classroom has its own complex system of group dynamics involving the motivations of the people gathered there. For second language (L2) motivation theory, in particular, the traditional notion of motivation as a fixed and innate quality of the individual is being replaced by the nascent notion of a changeable and exchangeable social construction (Dörnyei and Ushioda 2011). Such a conception naturally places modern research on L2 motivation in the uncertain terrain of nonlinear, complex, and chaotic systems theory. Also known as Dynamic Systems Theory (DST), this conceptual terrain has only been breached theoretically and implicationally for L2 learning theory (e.g., Ellis and Larsen-Freeman 2009), with some footpaths under construction for L2 learner motivation types (e.g., Dörnyei 2011), short-term L2 motivation changes (e.g., MacIntyre and Legato 2011), and long-term L2 motivation changes (e.g., Paiva 2011).

Between 2010 and 2012, in our communicatively oriented English classes at universities in Japan, we administered formative surveys at the beginning and end of each of the first semesters. Several times we also asked qualitative questions to our students in the second semester, after we had given them their first semester data back and asked for their reflections about it. These repeated-measures analyses, with quantitative and qualitative methods, were intended to follow the non-linear development of motivational mind-time frames: students' pasts (antecedent conditions of the learner; ACLs), students' presents (investments inside and outside of class), and students' future images (possible selves). Group interactions within classrooms can promote the healthy development of each individual student's three motivational mind-time frames. Developing into and evolving from each individual student's motivational system is the classroom system of motivational group dynamics, a framework displayed in Fig. 1 that we call *Present Communities of Imagining* (*PCOIz*; Murphey 2009; Murphey and Falout 2013; Murphey et al. 2012).

Tracing these measurements across time, we attempt to look at the motivational trajectory holistically within and across individuals and contexts, which may help uncover the signature dynamics in these systems. The aim is to clarify how classroom PCOIz helped increase the emerging, non-linear co-adaptation of socially situated motivation across one semester. This chapter will explore how learners' L2 motivations are co-constructed socially (i.e., intermentally) and change personally (i.e., intramentally) through emergent processes that can be explained through a DST interpretation of group dynamics.

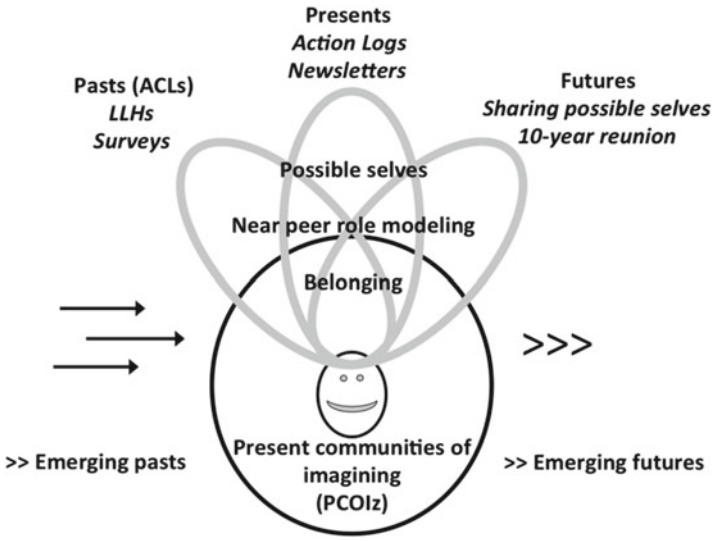

Fig. 1 Three motivational mind-time frames in PCOIz (Falout 2016; Falout et al. 2013a, b; Fukuda et al. 2012; Murphey and Falout 2013; Murphey et al. 2012) (Reprint permission given by Palgrave Macmillan, Multilingual Matters, The Japan Association for Language Teaching, and Wiley-Blackwell)

2 DST of PCOIz

Below we describe elements of DST that we think help to explain the classroom group dynamics, i.e., PCOIz, starting with the three motivational mind-time frames explained as three attractors.

2.1 Attractors

Motivation is a dynamic system that naturally fluctuates and can be unstable, yet over long periods of time the fluctuations can be seen to operate within a narrow range, showing resilience to large changes caused by external forces upon the system. Stabilizing forces within dynamic systems are known as attractors. An attractor within a motivational system guides the trajectory of motivation toward the same basin of attraction, maintaining a certain motivational state over time. Systems can have more than one attractor. This means that individuals can have multiple guiding attractors of motivation, each attractor of different sizes (range of influence) and strengths (degree of influence). Different properties and combinations of motivational attractors can show apparent conflicts or inconsistencies in a person's motivated thoughts and behaviours (Vallacher and Nowak 2009). For L2 learning, such inconsistencies might be seen in rhythmical starts and stops in studying, oscillations

of identifying and dis-identifying with classroom values, and a result of minimal growth in language ability. Conversely, a more stable set of positive-influencing motivational attractors would promote diligence in studies and growth in abilities.

Many students of English as a foreign language (EFL) in Japan can go through 6 years of secondary education and 4 years of tertiary education, exposed to variances in teachers, classmates, and curricula, yet retain a relatively narrow range of affective and behavioural patterns regarding the states of their EFL motivations across the years. Resistance to external influences that would seem to change the state of a system suggests the presence of an attractor (Vallacher and Nowak 2009). We see each of the three motivational mind-time frames within PCOIz as three separate but interrelating attractors. These are domain-specific (i.e., school subject) learning-related images that students have of themselves in their pasts (ACLs), presents (investments inside and outside of class), and futures (possible selves), each described below.

Antecedent Conditions of the Learner (ACLs) Students' ACLs are their thoughts, feelings, and images of themselves relating to their past learning abilities and experiences. ACLs function as academic emotional baggage, meaning that students carry these past-formed learning identities with them into whatever present learning experiences they have with the potential to influence them in their new experiences for better or worse (Carpenter et al. 2009; Falout et al. 2013a, b). The ACL construct may act as an attractor in a very important way. It seems to have an influence on motivational self-beliefs specifically relating to affective states and self-regulated learning behaviours that develop and persist over years (Carpenter et al. 2009; Falout et al. 2009), denoting an attractor within the system.

Present Investments Students' investments pertain to ongoing socially constructed identities that form their present effort and commitment to learning with the expectation of a return, especially from increasing cultural and social capital. This implies that the more learners pour their hearts into their learning, the more they anticipate rewards in the form of knowledge and ways (e.g., cultures demarked by class structures, local values, target language skills) that make them more acceptable or accessible to different cultural groups the learners wish to belong to transnationally or interculturally (Norton and McKinney 2011). This attractor comprises the engagement and gains in effort toward learning situated within the living present. Norton and McKinney (2011) state that an individual's investment can be ambivalent and even contradictory.

Possible Selves Students' possible selves are their thoughts, feelings, and images of themselves related to their future abilities and situations that are associated with the learning. These images can be multiple and of varying types, including expected, feared, and hoped for future circumstances (Markus and Nurius 1986). For learning languages, Dörnyei's (2009) L2 motivational self system recognizes the power of these future self images, specifically an Ideal L2 Self as an integrative motivator aiming toward belonging to a future community that relies on L2 use, and an

Ought-to L2 Self propelling toward socially expected goals and away from negative developments. Possible selves act as a motivational attractor so powerful they can guide those struggling with at-risk academic backgrounds and lifestyles toward successful results (e.g., Dunkel and Kerpelman 2006; Oyserman et al. 2006).

2.2 Feedback

Feedback between the systems' components is apparent within the PCOIz framework and related pedagogies. We conceive of the classroom itself as an open system with the students and teachers as components, and each student is also an open system with psychological components. In our classrooms, students explicitly discuss their language learning psychologies with their classmates. This includes their language learning histories (pasts), their ways of learning and using English now (presents), and their goals and aspirations regarding English (futures). These activities helped the components of these open systems – mainly the students and their feelings about learning – to communicate about themselves.

2.3 Fractalization

Fractalization, self-similar patterning, spreads across scales of at least two types of open systems functioning under optimal PCOIz conditions. Interpersonal conditions specify the *intermental* system, and psychological conditions specify the *intramental* system. In the activities, students begin to make sense of their own individual pasts, presents, and futures regarding English in relation to others' pasts, presents, and futures regarding English. As these subjective meanings are co-constructed socially, new patterns of related thinking emerge between the students' culture of learning (intermental system) and within their individual psychologies (intramental system). These new patterns then become similar or shared across the different scales of these systems.

2.4 Self-Organization

Self-organization further excites the system and generates its own agency. Students' views of their own pasts, presents, and futures naturally become shaped and reshaped as they exchange ideas via social learning. As students begin to organize their thinking about themselves they experience individual agency. And as they realize they are helping each other do this, a sense of collective agency also emerges. These reorganizations thus bring sensations of interrelatedness, hope, pathways thinking, and individual and collective agency.

2.5 Phase Transition

Phase transition of increased jumps in motivations occurs from positive changes to the three mind-time frame attractors across the classroom open systems. Students make sense for themselves as they see their own motivational footprints of where they have come from and where they are going to in their language learning. This understanding helps to reform their scattered senses of themselves in relation to their learning into a self-integrated self of past, present, and future. This transition of self-actualization appears to happen within the individuals and resonate across the classrooms in spontaneous synchronization, stemming from emotional contagion and aspirational contagion. Such in-phase couplings or hysteresis are seen in many interpersonal dynamics, such as the syncing of plans, goals, opinions, moods, and actions, particularly when people feel positive regard toward each other (Vallacher and Nowak 2009).

3 Methodology

Our surveys measured students' three mind-time frames of past, present and future motivations, aiming at understanding how these might be co-constructed with other students' three mind-time frames through mutual engagement in English class activities. The related data were collected for 3 years (2010, 2011, and 2012; e.g., see Fukada et al. 2011; Fukuda et al. 2012; Murphey et al. 2012) in a consistent manner in several undergraduate English communication courses we annually teach in the Japanese tertiary context using the following procedures.

First, we administered a pre-survey at the beginning of the first semesters to measure the learners' perceptions of English and English-learning developed in their three mind-time frames of past, present, and future, on a six-point Likert scale (see Murphey et al. 2012 for detailed information). Second, every class lesson offered small-group activities to promote social interaction and positive group dynamics. Also we occasionally offered opportunities to reflect, imagine, and share their EFL-related perceptions of past, present, and future selves (see the Sect. 6). At the end of the semester, we administered a post-survey by using the same questionnaire to investigate changes within their three mind-time frames. In some of the classes in the following semester, we also looped back these research results to the students with the process called critical participatory looping (Murphey and Falout 2010) to provide students with self-referential feedback, and elicited both quantitatively and qualitatively their perceptions of the research results.

We tried to measure the shift in students' perceptions using a multiple measures approach. Over the course of the 3-year sample represented in this study, we altered and added some questions to the survey to increase validity of the constructs and to investigate potential influences of other motivational factors. Therefore the comprehensive analysis of this study recognized these increases and changes by including every question related to the three mind-time frames that were used during the course of the 3 years of study.

4 Results

4.1 Quantitative Data Analysis

The quantitative data were collected for 3 years (2010: $n=462$; 2011: $n=403$; 2012: $n=486$; Total: $N=1351$). They measured changes within our students' three mind-time frames of motivation, which are socially influenced attractors for each student's personal system. By collecting the data both in the beginning and end of the first semester as pre- and post-surveys respectively, we explored how their different types of motivations transformed across one semester.

4.1.1 Pre-survey Results

The compilation of 3 years' pre-survey results (Fig. 2, see Tables 1 and 2 for detailed information) shows that many of the students visualized they would be using English in their future lives and careers, even at the beginning of the semester (Possible selves: $M=3.99$). Their perceptions of themselves in relation to English, theorized as developing through their past experiences, were moderately positive (ACL: $M=3.72$). They felt that they participated moderately in the English class activities

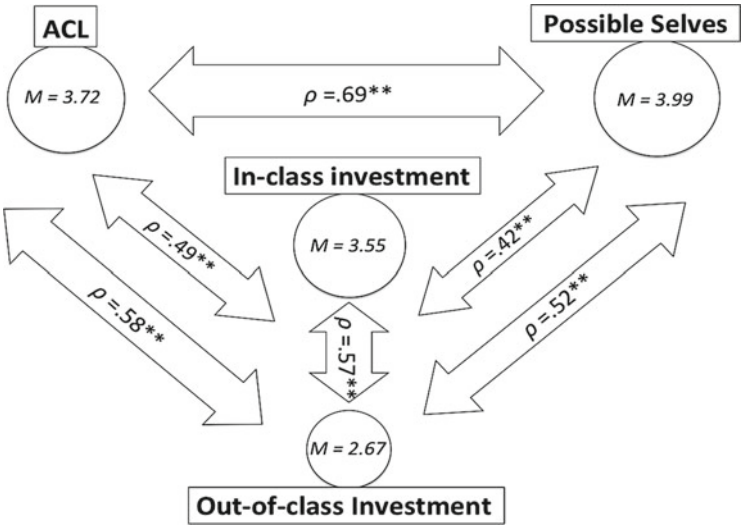

Fig. 2 Semester start measurements aggregated over 3 years (cf. Falout et al. 2013a, b; Fukada et al. 2011, 2012; Murphey et al. 2012 for the single-year [2010] pre-survey results) (Reprint permission given by Multilingual Matters, Palgrave Macmillan, The Japan Association for Language Teaching, and Multilingual Matters). Notes: Likert scale of 1 = negative, 6 = positive; ** Correlation is significant at $p<0.01$. Sizes of the *bubbles and arrows* are proportionate to the numbers within them

Table 1 Effect sizes of transformations of three mind-time frames across one semester

	Descriptive statistics			Wilcoxon signed-rank test		
	Pre-survey	Post-survey	Diff.	*Z*	*p*	*r*
ACL						
M	3.72	3.99	0.27			
Md	3.83	4.00	0.17	−12.24	**.000**	0.25
Std. Dev.	1.21	1.13				
n	1264	1047				
In-class investment						
M	3.55	4.01	0.46			
Md	3.50	4.00	0.50	−13.04	**.000**	0.27
Std. Dev.	1.24	1.12				
n	1276	1055				
Out-of-class investment						
M	2.67	3.18	0.51			
Md	2.50	3.17	0.67	−15.53	**.000**	0.32
Std. Dev.	1.16	1.17				
n	1266	1047				
Possible selves						
M	3.99	4.08	0.09			
Md	4.00	4.25	0.25	−3.95	**.000**	0.08
Std. Dev.	1.39	1.32				
n	1258	1040				

Table 2 Correlations of the transformations between three mind-time frames across one semester

		1	2	3	4
			Pre-survey		
1.	ACL	–	0.49	0.58	0.69
			(1223)	(1215)	(1247)
2.	In-class investment		–	0.57	0.42
				(1264)	(1215)
3.	Out-of-class investment			–	.52
					(1209)
4.	Possible Selves				–
			Post-survey		
1.	ACL	–	0.62	0.65	0.72
			(1039)	(1031)	(1026)
2.	In-class investment		–	0.59	0.48
				(1038)	(1030)
3.	Out-of-class investment			–	0.55
					(1025)
4.	Possible Selves				–

Notes: ( )=*n* of students; Correlations in Spearman's rho (ρ); $p < .01$

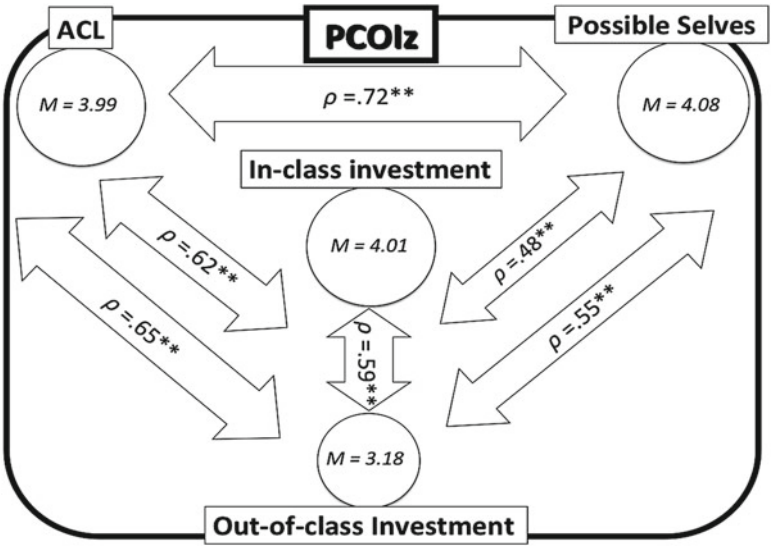

Fig. 3 Semester end measurements aggregated over 3 years (cf. Falout et al. 2013a, b; Fukada et al. 2011, 2012; Murphey et al. 2012 for the single-year [2010] post-survey results) (Reprint permission given by Multilingual Matters, Palgrave Macmillan, The Japan Association for Language Teaching, and Multilingual Matters). Notes: Likert scale of 1 = negative, 6 = positive; ** Correlation is significant at $p < 0.01$. Sizes of the *bubbles and arrows* are proportionate to the numbers within them

(In-class investment: $M = 3.55$), but their autonomous English-learning or use outside the classroom was reported by them to be relatively low (Out-of-class investment: $M = 2.67$).

Overall, large correlations between these attractors were recognized by the Spearman's rank-order correlation test at the beginning of the semester. Students who had positive perceptions of their English-learning pasts were found to visualize more clearly how they would be using English in their future lives and careers (Spearman's rho [ρ] = 0.69). Students with positive perceptions of their English-learning pasts or with clear English-related future visions were inclined to learn or use English autonomously outside the classroom ($\rho = 0.58$; $\rho = 0.52$, respectively), with slightly smaller correlations for reported active participation in English class activities ($\rho = 0.49$; $\rho = 0.42$, respectively). In addition, it was confirmed that students who participated actively in English class activities were inclined to engage in autonomous English-learning and use outside the classroom ($\rho = 0.57$).

4.1.2 Post-survey Results

The post-survey results (Fig. 3, see Tables 1 and 2 for more detailed information) indicated that the students had more positive perceptions of English and English-learning, and had slightly clearer English-related future visions throughout the

semester (ACL: $M=3.99$; Possible selves: $M=4.08$) as their emerging pasts and futures developed potentially through engaging within the English courses. It also recognized their engagement both inside and outside the classroom with English learning (investment inside class: $M=4.01$; Out-of-class investment: $M=3.18$). While the effect size was not large (ACL: $r=0.25$; In-class investment: $r=0.27$; Out-of-class investment: $r=0.32$; Possible selves: $r=0.08$), the increase of all of the attractors of students' motivational systems throughout the semester was found by the Wilcoxon rank order test to be statistically significant. Along with the positive increases of all the attractors, all of the correlations between them became even larger, resonating together in self-consistency.

We interpreted these results as showing an increased self-integration of our students' notions of their pasts, presents, and futures related to English and English-learning. We hypothesized that the increase in the positivity of these three attractors stemmed from the students' reflection on their past English-learning, social interactions, collaborative work in their presents, and the imagining of their English-related futures in the open-system classroom communities, which we call PCOIz.

4.2 Qualitative Data Analysis

As a qualitative side of our theorizing students' group-framing of English-learning motivation within their PCOIz, we asked our students open-ended questions to figure out to what extent they felt a sense of belonging to the class, and also what impact their classmates may have had on them. Understanding the students' own perceptions is indispensable to theorizing group framing of English-learning motivation within PCOIz. This is particularly important since students' sense of belonging to their PCOIz and their intermental reflecting, socializing, collaborating, and imagining may often go unnoticed by teachers, or the opposite, in that teachers might falsely imagine what their students are imagining. Next we summarize the results from two of these open-ended questions.

4.2.1 The Students' Sense of Belonging

In a looping activity administered in the second semester, 2010, sharing the pre- and post-survey results with students, we asked students directly: "Do you think the students in the classroom became a community to share dreams of learning English? If 'yes,' why? If 'no,' why not?" We received 159 comments from 186 students who had been with us first semester and were continuing with us in the second semester. These comments were separated into 171 semantic segments based on their content. From 171 semantic segments, 85.96 % ($n=147$) were effectively responding "Yes, I think the classroom became a community," with 14.04 % ($n=24$) effectively responding "No, I don't think the classroom became a community." Many of the

Table 3 Effects of imagining ideal L2 classmates (%)

Positive change	No change	Negative change	Mixed or unclear reaction	No answer	Total
77.75	4.34	0.29	2.31	15.32	100.00
(***n*** **= 269**)	(*n* = 15)	(*n* = 1)	(*n* = 8)	(*n* = 53)	(*n* = 346)

positive comments related to the students' awareness of their motivations being co-constructed intermentally:

> Yes. We think it was because we were able to strengthen our motivation together through group work.
>
> I think we became a community. I think it's because we enjoyed being able to speak and understand English, even if we don't have much knowledge of basic English grammar or English vocabulary.

Some students reported that interacting with their classmates inspired them. Finding out that others had similar learning experiences validated many students' feelings about what was happening to them by participating in the class:

> Yes, because we actually do. And we all have high motivation for study English, and share it, and make them higher interactive.
>
> Yes. Unlike at high school, there are students who share the same ideas about learning English at college, so we can stimulate each other.

Another source of inspiration came from finding out the differences between them and their peers.

> In [This University], people can speak English so if I can't speak English, I envy everyone. So I want to study more and more.
>
> Yes, we talked about our future dreams in medium of English, and I was inspired from my partners' dream. It made me think I need to do more learning like him!!

These qualitative data show that positive PCOIz can work well when students are open to diversity in their memberships.

4.2.2 Student-Reported Changes in PCOIz

In the year 2012, we asked students at the end of the first semester the following open-ended question:

> Please describe any changes you have made during this semester in your behaviour or attitudes toward your classmates. What influences do you think these changes may have had on your classmates, relationships in and out of class, and your English learning?

As a result of coding the students' answers ($N = 346$), we confirmed that 77.75 % ($n = 269$) of the students felt that they changed positively throughout the semester (See Table 3).

The students' comments categorized as *positive change* ($n = 269$, 77.75 %) were further analyzed by coding them (separating each student's comment into semantic segments and categorizing them) to clarify what kind of positive effects the students

Table 4 Five different types of positive change through learning with their classmates (%)

1. Belonging, fellowship, community	2. Positive affect toward English and English use	3. Increased English skills/ competence	4. Collaborative actions, effort, and engagement in English-learning/use inside the classroom	5. Collaborative actions, effort, and engagement in English-learning/use outside the classroom	Total
28.46	38.62	7.52	22.76	2.64	100.00
($n=140$)	($n=190$)	($n=37$)	($n=112$)	($n=13$)	($n=492$)

felt they had through learning English with their classmates. The results revealed five different types of positive effects (see Table 4).

It was notable that many of the students stated in their comments that more than one type of positive change occurred, as below:

> Before I entered university, I only studied reading and listening, so I didn't have many chances to speak English, and I was poor at it. However, all through this semester, I talked in English with my classmates whose abilities are similar, and we helped each other. So, we became friends and successfully improved our speaking skills. Above all, I became active in studying English.

Consistent with the 3 years' quantitative results, it was recognized that students also felt their English-learning motivation and their English learning were strengthened and supported by their classmates.

5 Discussion

Through describing what we have called PCOIz and looking more closely at the affordances through the lens of DST, we are led to propose the additional concept of **Socially Intelligent Dynamic Systems** (SINDYS) (Murphey 2013). Many dynamic systems (the weather, bird migrations, etc.) cannot reflect on data about themselves, whereas a group of people can potentially benefit from getting certain information about themselves. While getting information only about oneself may be helpful, it can be significantly more helpful to also have the information about those in a peer cohort in order to compare and reflect upon possible changes to our lifestyles. Group framing of motivation goes hand in hand with the critical participatory looping processes (Murphey and Falout 2010) of looping information back to the group for promoting active SINDYS. We also propose that individuals and groups vary between active and passive SINDYS that ideally adjust appropriately with the affordances offered by changing contexts (Fig. 4). Thus, we see ecological worth in being able to work both socially and introvertedly (Falout et al. 2016), to be both active and passive at times, in our dynamically changing worlds (Fig. 5).

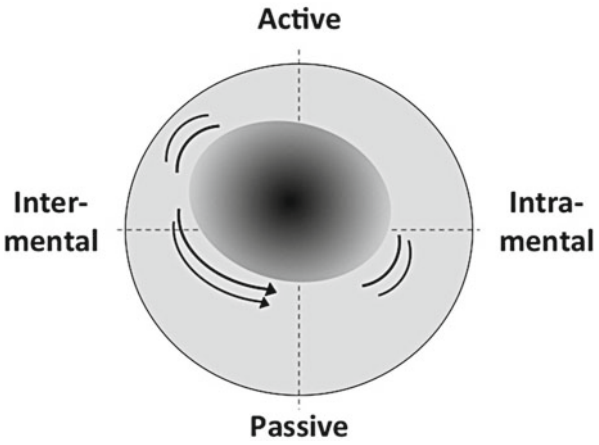

Fig. 4 Dynamic continuums of a SINDYS (Falout et al. 2016) (Reprint permission given by Springer)

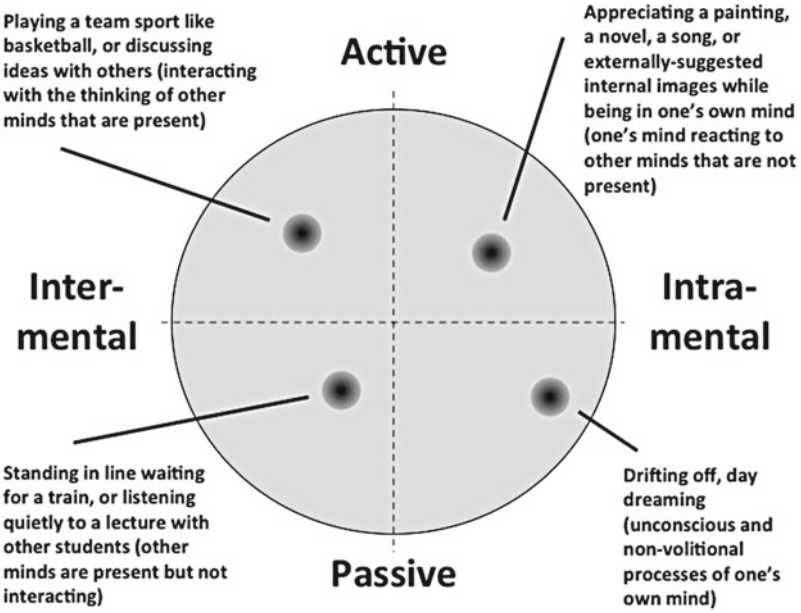

Fig. 5 Dynamic and ecological positioning for needs (Falout et al. 2016) (Reprint permission given by Springer)

We propose that a class can be an *active* SINDYS when class members are capable of doing the following:

- *gathering*, *communicating*, and *reflecting* on data about themselves.
- *interacting* with other SINDYS (e.g., other classmates, groups, and classes) and learning from them, while stimulating more feedback.

- *accepting* that improvements in themselves are incremental and at times negatively oriented (i.e., there will be regressions, lapses, and dysfunctions to deal with).
- *imagining* being in the place of others (theory of mind), dreaming, pretending and playing.
- *agentizing* the agents (group members), which at times permits them to strive even in the face of overwhelming adversity (quixotically).
- *syncing* individuals' agency together in groups and teams, creating group agency, a form of social capital.

We realize that in many educational systems SINDYS may be overly dormant, i.e., inactive. If students are only processing introvertedly while in a group (e.g., while listening to a lecture) they are not capitalizing on the affordances of being in a group. Teachers who pause every so often to ask students to summarize in pairs and small groups what they have just said in the lecture, are inviting a different mode of thinking and interaction that can complement their students' introverted intelligences.

PCOIz with their three attractors of motivational mind-time frames also fit into our picture of SINDYS. As mentioned previously, motivation has long been studied as an individual trait, and our research is telling us that while the individual certainly retains a lot of potential agency, actually much more weight than previous research recognizes belongs to the influence of the groups that we participate in. Our research on motivational mind-time frames tells us that each notional mind-time frame within individuals influences the other mind-time frames, and that group members influence each other, even deeper within their personal mind-time frames. Especially when the classroom system gets stimulated with much inter-member interaction and shared information, students' positive feelings and motivations seem to resonate and increase. Developing respectful democratic relationships can help people balance both expressing their individual agency and aligning themselves with others through group agency. We find that SINDYS using critical participatory looping show respect for the individual and the group by including individual and group information for further reflection.

Conceptualizing the three-dimensional motivational mind-time frames as attractors, and offering feedback about them to the students, can make the attractors more positive and lead to a phase transition. Such a phase transition occurs at a tipping point when components synchronize. This syncing is also amplified by emotional and aspiration contagion (Murphey 2012), especially with near peer role models (Murphey and Arao 2001), sparking transitions (shifts) in whole groups and individuals by syncing not only their present behaviours but also notions of their pasts and aspired-to futures. This syncing, we think, is a signature dynamic of a SINDYS that is able to create information about itself and reflect and act upon it. It is worth stressing again that our research suggests that it is not only the present positive behaviour that syncs, but also participants' aspirational imaginations and ultimately their useful interpretations of their pasts (e.g., that we can learn useful things from our mistakes).

The three motivational mind-time frames, when stimulated and communicated in groups, can begin syncing (i.e., falling into rapport) among group members due in part to the flow of social feedback, along with the fractalization, or scaling, of intramental and intermental processing. This information also allows self-organization of both individual and collective agency, from which emerge sensations of interrelatedness, hope, belonging, and pathways thinking. Cozolino (2013) writes that because our brains are social organs, "establishing a tribal classroom can be so beneficial to learning" for children (p. 11), and that elderly people "who remain connected and needed by others are far more likely to remain vital and alive" (p. 38). This suggests to us that self-consistency is important not only for notional mind-time frames, but also across each individual's lifetime of lived experience and across each generation's social connections to other generations.

6 Pedagogical Implications

We think our students' interactions among themselves with using PCOIz-based activities largely account for the positive growth in their three mind-time frames of English-learning motivation. Class activities also form one of the components of the classroom open-systems that instructors can organize to allow affordances for language practice and learning, and to influence the students' three mind-time frames within classroom PCOIz and SINDYS.

For example, writing and sharing their language learning histories can support students' reflecting upon their own and others' past learning experiences. Action logs and newsletters can facilitate students' reflecting upon and sharing their investment in English-learning and use at present. Different types of activities for reflecting upon and sharing possible selves can promote students' imagining of their English-related futures (details of these activities can be found in Fukada et al. 2011). Furthermore, activities based on critical participatory looping (Murphey and Falout 2010) can promote the syncing of students into active SINDYS, often giving students the agency to transform themselves and their classmates.

7 Conclusion

Our data for 3 years support the idea that interactive classrooms and critical participatory looping seem to make more positive PCOIz and active SINDYS out of groups of students that had been at risk of being too dormant in an educational system that had ignored the affordances of socialization. The data also show increases in the motivations of individuals within situated mutual engagement, which we think is better explained as a group framing of motivation due to the PCOIz in which they are interacting as vibrant SINDYS. PCOIz and SINDYS could become key concepts explicating the mechanisms of group-framing of motivation, and we hope this study

stimulates further research into the power of notional mind-time frames upon learning and living.

Questions for Reflection on Future Teaching Practice

As this chapter highlights, sharing ideas and aspirations with others can help lead people to make meanings and find understandings that would not have been possible had they worked alone. Therefore the authors recommend that you find one or more colleagues to get together with to answer the following questions.

1a. This study shows significant increases in, and medium-to-large correlations between, English learners' past selves (ACLs), present in-class and out-of-class investment, and future selves. It was theorized that these motivational mind-time frames became more positive from students' interactions using 'possible selves' activities. Try to identify which activities below correspond to each of these motivational mind-time frames (see Fukada et al. 2011 for fuller descriptions of some of these activities).

- Doing project work that relates to students' field of interest
- Reading a newsletter about students' views about current class activities
- Role-playing a 10-year class reunion party
- Sharing job aspirations
- Sharing language learning histories

1b. As a language instructor, what kinds of class activities do you think you can offer to promote your students' positive past selves, present investments, and future selves?

2. This chapter argues that classrooms can be communities that are socially intelligent systems. Think of any classroom or community that you have been a part of, and describe how it might have behaved as a socially intelligent system.
3. This chapter presented a way of looping information about students back to students, called critical participatory looping. Think of a community or group that you belong to. What kind of group information would be good for you or the community to get about itself?
4. The research in this chapter was conducted longitudinally across several semesters, within different classrooms, and with 3 years' data compiled together. This way of compiling data is known as a panel study. For your classes, what kind of action research can you imagine doing as a longitudinal study, panel study, or both combined?

References

Carpenter, C., Falout, J., Fukuda, T., Trovela, M., & Murphey, T. (2009). Helping students repack for remotivation and agency. In A. M. Stoke (Ed.), *JALT2008 conference proceedings* (pp. 259–274). Tokyo: JALT.

Cozolino, L. (2013). *The social neuroscience of education*. New York: W.W. Norton & Company.

de O. Paiva, V. L. M. (2011). Identity, motivation and autonomy in second language acquisition from the perspective of complex adaptive systems. In G. Murray, X. Gao, & T. Lamb (Eds.), *Identity, motivation and autonomy in language learning* (pp. 57–72). Bristol: Multilingual Matters.

Dörnyei, Z. (2009). The L2 motivational self system. In Z. Dörnyei & E. Ushioda (Eds.), *Motivation, language identity and the L2 self* (pp. 9–42). Bristol: Multilingual Matters.

Dörnyei, Z. (2011). Researching complex dynamic systems: 'Retrodictive qualitative modelling' in the language classroom. *Language Teaching*, pp. 1–12. Retrieved January 26, 2012, from http://journals.cambridge.org/abstract_S0261444811000516.

Dörnyei, Z., & Ushioda, E. (2011). *Teaching and researching motivation* (2nd ed.). Harlow: Longman.

Dunkel, C., & Kerpelman, J. (Eds.). (2006). *Possible selves: Theory, research and applications*. New York: Nova Science.

Ellis, N. C., & Larsen-Freeman, D. (Eds.). (2009). *Language as a complex adaptive system*. West Sussex: Wiley-Blackwell.

Falout, J. (2016). Past selves: Emerging motivational guides across temporal contexts. In J. King (Ed.), *The dynamic interplay between context and the language learner* (pp. 47–65). Basingstoke: Palgrave Macmillan.

Falout, J., Elwood, J., & Hood, M. (2009). Demotivation: Affective states and learning outcomes. *System, 37*(3), 403–417.

Falout, J., Fukada, Y., Murphey, T., & Fukuda, T. (2013a). What's working in Japan? Present communities of imagining. In M. Apple, D. Da Silva, & T. Fellner (Eds.), *Language learning motivation in Japan* (pp. 245–267). Bristol: Multilingual Matters.

Falout, J., Murphey, T., Fukuda, T., & Trovela, M. (2013b). Japanese EFL learners' remotivation strategies. In M. Cortazzi & L. Jin (Eds.), *Researching cultures of learning: International perspectives on language learning and education* (pp. 328–349). Basingstoke: Palgrave Macmillan.

Falout, J., Murphey, T., Fukuda, T., & Fukada, Y. (2016). Whole-class self-referential feedback from university EFL contexts to the world: Extending the social life of information by looping it forward. *The Asia-Pacific Education Researcher, 25*(1), 1–10. doi:10.1007/s40299-015-0227-4.

Fukada, Y., Fukuda, T., Falout, J., & Murphey, T. (2011). Increasing motivation with possible selves. In A. Stewart (Ed.), *JALT2010 conference proceedings*. Tokyo: JALT.

Fukuda, T., Fukada, Y., Falout, J., & Murphey, T. (2012). Holistic timing and group framing of motivation. In A. Stewart & N. Sonda (Eds.), *JALT2011 conference proceedings* (pp. 380–391). Tokyo: JALT.

MacIntyre, P. D., & Legato, J. J. (2011). A dynamic system approach to willingness to communicate: Developing an idiodynamic method to capture rapidly changing affect. *Applied Linguistics, 32*(2), 149–171.

Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist, 41*(9), 954–969.

Murphey, T. (2009). Present communities of imagination. *PeerSpectives, 2*, 14–15.

Murphey, T. (2012). *Teaching in pursuit of WOW!* Tokyo: Abax.

Murphey, T. (2013). The impact of self-information given to socially intelligent dynamic systems (SINDYS) i.e. Classes! *Scuola e Lingue Moderne,* 1–5, 6–9.

Murphey, T., & Arao, H. (2001). Changing reported beliefs through near peer role modeling. *TESL-EJ, 5*(3), 1–15.

Murphey, T., & Falout, J. (2010). Critical participatory looping: Dialogic member checking with whole classes. *TESOL Quarterly, 44*(4), 811–821.

Murphey, T., & Falout, J. (2013). Individual differences in the classroom. In C. A. Chapelle (Ed.), *Encyclopedia of applied linguistics: Language learning and teaching* (Vol. 15, pp. 2650–2654). Oxford: Wiley-Blackwell.

Murphey, T., Falout, J., Fukada, Y., & Fukuda, T. (2012). Group dynamics: Collaborative agency in present communities of imagination. In S. Mercer, S. Ryan, & M. Williams (Eds.),

Psychology for language learning: Insights from research, theory and practice (pp. 220–238). Basingstoke: Palgrave Macmillan.

Norton, B., & McKinney, C. (2011). An identity approach to second language acquisition. In D. Atkinson (Ed.), *Alternative approaches to second language acquisition* (pp. 73–94). New York: Routledge.

Oyserman, D., Bybee, D., & Terry, K. (2006). Possible selves and academic outcomes: How and when possible selves impel action. *Journal of Personality and Social Psychology, 91*(1), 188–204.

Vallacher, R. R., & Nowak, A. (2009). The dynamics of human experience: Fundamentals of dynamical social psychology. In S. J. Guastello, M. Koopmans, & D. Pincus (Eds.), *Chaos and complexity in psychology: The theory of nonlinear dynamical systems* (pp. 370–401). Cambridge: Cambridge University Press.