Research on Motivation in Collaborative Learning: Moving Beyond the Cognitive–Situative Divide and Combining Individual and Social Processes

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In this article we propose that in order to advance our understanding of motivation in collaborative learning we should move beyond the cognitive–situative epistemological divide and combine individual and social processes. Our claim is that although recent research has recognized the importance of social aspects in emerging and sustained motivation in collaborative learning activities, the social is mainly conceived as a unidirectional source of influence on individual motivation. In the article we examine the significance of motivation in research on collaborative learning. We discuss two characterizations of the role of the social in conceptualizations of motivation, namely, social influence and social construction, and outline our case for moving beyond the cognitive–situative divide and combining individual and social processes in research on motivation. Finally, we present illustrations from recent research on motivation in collaborative learning that has attempted to bridge the cognitive–situative divide across theoretical perspectives or using different methods.

In this article we argue that in order to advance our understanding of motivation in collaborative learning, both individual and social processes need to be considered. Our claim is that although recent research has recognized the importance of social aspects in the development of motivation in collaborative learning activities, the social is generally conceived as a unidirectional source of influence on individual motivation. Although this approach is conceptually useful as it can reveal the mediating role of (meta)cognitions on individual engagement, it is not sufficient in our view to understand how motivation emerges and is sustained through social interactions in a group learning activity. We propose that research on motivation in collaborative learning move beyond the cognitive–situative epistemological divide and combine individual and social processes theoretically and methodologically.

Our proposal is based on the assumption that in collaborative learning, individual group members represent interdependent self-regulating agents (cognitive angle) who at the same time constitute a social entity that creates affordances and constraints for engagement in the activity (situative angle). It is our contention that a situative angle focusing on group processes is necessary to capture the social construction and enactment of motivation but that it needs to be complemented by a cognitive angle, which taps into the mediating role of individual members' metacognitive reflections

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and interpretations. Supported by the theoretical argument that social and individual processes occur concurrently and represent distinct systemic levels (Volet, Vauras, & Salonen, 2009), we argue that these processes are in need of joint consideration to advance our understanding of motivation in collaborative learning.

The article is divided into five sections. We first examine the significance of motivation in research on collaborative learning. We review studies reporting the multiple socio-emotional challenges experienced by groups and individuals as they participate in group learning activities, and the consequent need for regulation of motivation and engagement. The second section examines two conceptualizations of motivation that attend to its social nature, namely, social influence and social construction. The strengths and limitations of each conceptualization for understanding motivation in collaborative learning are discussed. We note a similar, ongoing epistemological debate on the respective roles of the psychological and the social in research on learning and conceptual change. The third section outlines our case for moving beyond the cognitive–situative divide and combining individual and social processes in research on motivation in collaborative learning. We argue that individuals as interdependent self-regulating agents with metacognitive capacities, and the group as a social system with its own dynamics, need to be conceived as jointly coregulating motivation and engagement in collaborative learning. The fourth section presents illustrations from recent research of motivation in collaborative learning that have attempted to bridge the cognitive–situative divide across theoretical perspectives or using different methodologies. The fifth section summarizes our argument and presents directions for future research.

MOTIVATION IN RESEARCH ON COLLABORATIVE LEARNING

Research on real-life collaborative and cooperative learning has increased dramatically over the last two decades, with strong theoretical and empirical support for the cognitive and motivational benefits of collaborative, as opposed to competitive and individualistic learning activities (e.g., Webb, Nemer, & Ing, 2006). Students' productive engagement in collaborative interactions (e.g., Barron, 2003; Van Boxtel, van der Linden, & Kanselaar, 2000), socially shared coregulation (e.g., Salonen, Vauras & Efklides, 2005; Vauras, Iiskala, Kajamies, Kinnunen, & Lehtinen, 2003), and elaborative cognitive partnerships (e.g., King, 1998, 2002) is viewed as facilitated by the group's coordinated engagement in the shared problem space (Roschelle & Teasley, 1995). Achieving such coordination is not an easy process, as each group member is a self-regulating agent with unique cognitions and emotions, which can create major challenges to motivation in social interactive contexts.

Although the motivational benefits of learning with others are well documented (Blumenfeld, Kempler, & Krajcik, 2006), less is known about how motivation emerges and is sustained in collaborative learning activities. Motivation in learning is generally defined as the psychological drive that leads to cognitive engagement and ultimately achievement. The literature on self-regulation of learning (e.g., Boekaerts, Pintrich, & Zeidner, 2000; Zimmerman & Schunk, 2001, 2007) has conceptualized motivation in two complementary ways, first as the direction and drive for self-regulated learning (e.g., through goal orientation, personal goals, motives, or learning intentions) and second as an integral part of effective self-directed learning, which needs to be regulated to sustain productive engagement (e.g., Wolters, 1998). The extent to which these conceptualizations are adequate to understand the role of motivation in socially challenging collaborative learning activities has not been fully examined.

As widely documented in the educational literature (e.g., Blumenfeld, Marx, Soloway, & Krajcik, 1996; Bosworth & Hamilton, 1994; Burdett, 2003; Pauli, Mohiyeddini, Bray, Michie, & Street, 2007; Salomon & Globerson, 1989; Webb & Palincsar, 1996), groups can face multiple types of social challenges, which interfere with the social process of learning and task completion. Research in university contexts has revealed that challenges can range from perceived incompatibility of personality characteristics to emerging problems in social relationships. During a group learning activity, for example, challenges can arise due to differences in respective goals, priorities and expectations, or conflicts generated by interpersonal dynamics, such as different styles of working or communicating, the tendency of some individuals to rely on others to do their share of the work, and power dynamics among members (Arvaja, Salovaara, Häkkinen, & Järvelä, 2007). Groups that are culturally diverse can face further challenges due to greater differences in background characteristics. These can include language and familiar communication style, as well as prior cultural-educational experiences, which leave students unprepared to break out of their zone of comfort and interact with less familiar peers (e.g., Volet & Ang, 1998; Volet & Karabenick, 2006).

Groups and individuals also face challenges generated by the cognitive processes required in collaborative learning, such those involved in creating a common ground in shared problem solving (e.g., Mäkitalo, Häkkinen, Järvelä, & Leinonen, 2002), negotiating multiple perspectives, and handling complex concepts (e.g., Feltovich, Spiro, Coulson, & Feltovich, 1996). Finally, challenges can also be triggered by circumstances external to the task itself. For example, group members may experience practical hurdles that constrain their full engagement and participation (e.g., Järvenoja & Järvelä, 2009; Volet & Mansfield, 2006). These challenges place significant emotional pressure on individuals to restore their wellbeing, maintain motivation, and achieve personal and group oriented goals.

The actual process of collaborative learning therefore represents a major source of situational appraisals, which have a significant impact on motivation. When individuals' characteristics, goals, and situational demands clash and create conflicts, strong negative emotions are aroused, forcing individuals to exercise control over their emotions, their motivation, and sometimes their social environment. Given the challenging nature of most group activities, the regulation of personal emotions is needed for continued engagement and progress toward goal achievement (Boekaerts & Corno, 2005; Efklides & Volet, 2005; Järvenoja & Järvelä, 2005; Salonen et al., 2005; Wolters, 2003).

Overall, although motivation is an essential component of successful collaborative learning, students' motivation is continually challenged. Based on the collaborative and cooperative learning literature, many challenges to group members' productive participation appear to be socio-emotional in nature and emerging through interactions during the activity. Examining the role of the social in current conceptualizations of motivation is therefore critical for a better understanding of its significance in productive collaborative learning.

SOCIAL CONCEPTUALIZATIONS OF MOTIVATION

According to Nolen and Ward (2008), two distinct characterizations of the role of the social in conceptualizations of motivation can be identified. The first considers motivation as a characteristic of individuals, which is *socially influenced* by the context. The second considers motivation as *socially constructed* through interactions, and conceptualizes individuals and context as inseparable and mutually constitutive.

Motivation as Socially Influenced

The view that motivation is socially influenced has been the most prominent perspective in research on learning for the last few decades (Zimmerman & Schunk, 2007). This characterization is based on the assumption that motivation is a psychological phenomenon and that the social context has an impact on individuals' motivation to engage in learning activities. A substantial body of empirical research supports this assumption. Most of that research is grounded in a sociocognitive perspective on the role of individual motivation within self-regulated learning theory and its individual-in-context extension to accommodate the significance of contexts. According to Nolen and Ward (2008), recent work from a sociocultural perspective also represents the social influence characterization, because the focus is on mediated individual action, internalization of the social world, or individual appropriation as an outcome of participation in social interactions, rather than on a negotiated, coconstructed social process.

Research grounded in a sociocognitive perspective has investigated the significance of the social environment on motivational beliefs, achievement motivation, goals, and appraisals. This work is diverse, not only in terms of the motivational constructs under investigation but also in the way the social environment has been conceptualized. It has been argued that multiple levels of contexts need to be considered to understand the complexity of macro- and microlevel influences on learning and motivation, including the nested nature of some of these contexts (Gurtner, Monnard, & Genoud, 2001; Volet, 2001). Social contexts and their influences can range from microlevel influences of the peer group (Salonen et al., 2005), to meso-level influences of classroom goal structures (Urdan, Kneisel, & Mason, 1999) and teacher discourse (Krapp & Lewalter, 2001; Turner, Meyer, Midgley, & Patrick, 2003), through to broad cultural-educational influences at the macrolevel of educational systems and societal values (Salili, 1996; Triandis, 1995). Consistent across studies is evidence that individual motivation and engagement in learning activities, whether self-reported in questionnaires and interviews or inferred from observations, can be related in a meaningful way to the norms, values, or characteristics of those social contexts.

Research on social goals and social goal orientation is another body of literature from a sociocognitive perspective that reflects the social influence characterization. There is substantial evidence that students' goals to engage in learning activities are not only directed at the task or their own performance but also reflect the social context of which they are an integral part. This is highlighted in the range of social goals identified in the literature, for example, social approval goals, social responsibility goals, social interaction goals, social relationship goals, social status goals, contextual goals, or prosocial goals (Boekaerts, de Koning, & Vedder, 2006; Ford, 1992; Järvelä & Salovaara, 2004; Urdan & Maehr, 1995; Wentzel, 1991). At the macrolevel, it is well documented that differences in cultural-educational and societal values are reflected in levels of achievement motivation and social responsibility goals (Dowson & McInerney, 2003; Urdan & Maehr, 1995). At the microlevel, the impact of social influences is reflected in goals to gain peer acceptance or social status, to please the teacher or parents, or alternatively to avoid getting in trouble (Boekaerts, 2002; Mansfield, in press; Wentzel, 1999). Students' interpretations of their interactions with peers have revealed how their goals are shaped through those interactions (Boekaerts & Minnaert, 2006) and how the actions of group members can have both positive and negative influences on individual motivation (Järvenoja & Järvelä, 2005; Volet & Mansfield, 2006). The view that the social environment exerts an influence on individual motivation has led Wosnitza and Volet (2009) to claim that in a collaborative learning activity, learning, performance, and affect goals can be in the service of others or the group as a whole ("we" type goals) rather than just at the self.

To date, research on the role of the social in motivation from a sociocognitive perspective has predominantly used self-report data. This reflects the assumption that the impact of social influences is mediated by cognitions and interpretations and that these can provide useful indicators of a person's motives and drives to engage in a learning activity. It is worth noting that studies examining social influences on motivation across macrolevel types of contexts (e.g., family, school, educational system, cultural group) have implicitly conceptualized social influences as having an unidirectional impact, whereas work examining the impact of social influences at the classroom level has often recognized that during interactions, individuals and contexts may exert reciprocal influences on each other (Gurtner et al., 2001). The idea of reciprocal influences is reminiscent of reciprocal determinism, which has a long history within social cognitive theory (Bandura, 1989). The social influence perspective on motivation is consistent with Bandura's complex model of causation, which postulated dynamic and reciprocal interactions between personal factors, behaviors, and the environment, each exerting a source of influence on the others.

Recent work framed in a sociocultural perspective has also examined how the social, conceptualized as actual social interactions that students engage in, influences motivation. For example, Walker and colleagues (Pressick-Kilborn & Walker, 2002; Walker, Pressick-Kilborn, Arnold, & Sainsbury, 2004) argued that situational and personal interests are created through participation in meaningful classroom activities, which provide affordances and constraints for the development of individual motivation and engagement. To investigate this process, Pressick-Kilborn and Walker examined the social norms and meanings that make up classroom activities and the role that these play in individuals' displayed interest, alongside the meaning that individuals themselves make from that interest. This approach revealed how the environment can constrain or enable the development of individual interest through a process of "canalization." Canalization by the social world refers to the ways in which other people, consistent with their values and goals, channel a learner's activities in certain ways. Through the notion of canalization Valsiner (1992) explained how the social world and the opportunities available to individuals create the context in which interest may emerge. The importance given to social interactions and participation in the sociocultural perspective brings this approach close to the social construction characterization. A key difference, however, is the focus on the intraindividual process of internalization, which is assumed to lead to the development of individual interest and motivation (cf. Vygotsky, 1978). This is in contrast to the social construction characterization, which is concerned with how members of a group, constituted as a social system, cocontribute to their engagement in a collaborative learning activity.

Motivation as Socially Constructed

The second conceptualization of motivation that reflects its social nature is the *social construction* perspective, which builds upon the idea that motivation emerges through interactions in a social situation (Järvelä & Volet, 2004; Nolen & Ward, 2008). This situative perspective is based on the assumption that motivation is a social phenomenon and that actual engagement represents enacted motivation. This process-oriented perspective views engagement, or enacted motivation, as socially created and maintained through an active and ongoing process of socially shared or coregulation. The social system that individuals are part of is assumed to provide affordances and constraints for members to fully engage, to stay at the periphery until ready, or alternatively to avoid engagement (Hickey, 2003; McCaslin & Hickey, 2001). By conceptualizing motivation as coconstructed and negotiated among the collective, interactive, and even shared activity of group members (Järvelä & Järvenoja, in press; Järvenoja & Järvelä, 2009), the social construction perspective distinguishes itself from reciprocal determinism. More specifically, the social construction perspective on motivation does not postulate reciprocal sources of influence that individuals may exert on each other but instead assumes that groups as social entities coconstruct their collective engagement in joint activities. Accordingly, from a social construction perspective, social and individual processes are conceptualized as occurring simultaneously, as they represent adaptive processes that take place concurrently at different systemic levels (Volet et al., 2009).

In the context of collaborative learning, it is expected that participants bring along their motivational beliefs, tendencies, and goals and that these will play a mediating role in their actual engagement in the group activity. From a situative perspective (Nolen & Ward, 2008), however, and consistent with the social construction conceptualization of motivation it is argued that the extent to which a group engages productively in the activity cannot be predicted from the aggregated motivational characteristics of its members (Hickey, 2003). As revealed in research on collaborative learning, each group generates its own social dynamics and it is through members' interactions that engagement, as enacted motivation, is afforded or constrained (Järvenoja & Järvelä, 2009). This raises the importance of better understanding the "dynamics and interpersonal coordination of shared and self-regulatory processes" (Vauras, Salonen, & Kinnunen, 2009), which take place in collaborative learning activities.

Consistent with its focus on social interactions and participation in group activities, this social conceptualization of motivation has led to research at the microlevel of learning and the use of process data obtained from collaborative learning activities. For example, Järvelä and her colleagues have been analysing the socioemotional aspects of peer interaction and group learning and illustrated how students' motivational accounts of the interaction reflect changes in

engagement (Järvelä, Järvenoja, & Veermans, 2008; Järvelä, Veermans, & Leinonen, 2008). Similarly, Vauras and colleagues' (Vauras et al., 2009) microgenetic analyses revealed how individuals' cognitive, affective, and motivational behaviours during real-time activities were related to change processes in their social relationship patterns. Nolen's (2006, 2007) research also examined the social construction of motivation but over an extended period, with a view to capturing trajectories of motivation to read and write. Her ethnographic observations of different classroom interactions at several points in time revealed how students' motivations were co-constructed and negotiated with their teachers and each other. They also found evidence of trajectories from peripheral to central engagement, which could be interpreted in relation to teacher-learners' shared goal for writing. In sum, the social construction conceptualization of motivation provides a useful theoretical perspective to examine motivation as an enacted, dynamic, and social process.

Strengths and Limitations of the Two Social Conceptualizations of Motivation for Understanding Motivation in Collaborative Learning

Overall, the major difference between the two characterizations of the role of the social in conceptualizations of motivation is that the social influence approach construes motivational constructs as the psychological processes that drive engagement and views them as influenced by the social context (cognitive/sociocognitive angle). In contrast, the social construction approach views these motivational constructs as social processes of engagement that emerge through interactions (situative angle). Each approach has distinct strengths and limitations to explain why individuals and groups engage productively in a collaborative learning activity. The social construction perspective is conceptually attractive to frame the emerging, enacted and constantly renegotiated nature of motivation in actual, time-framed collaborative learning activities. This conceptualization, therefore, blends well with the situative perspective on learning in activity, which emphasizes cognitive–interactional (Greeno, 2006) and coregulatory (Volet et al., 2009) processes. A major limitation of the social construction approach, however, is the lack of attention given to the mediating role of individuals' (meta)cognitions on their engagement and participation, an issue highlighted in Summers and Volet's (2009) recent research. This limitation is one of the strengths of the social influence approach, especially where a distinction is made between motivational constructs at several levels of specificity, for example, overall inclinations such as achievement motivation, tendencies such as motivational beliefs regarding a particular form of instruction, and situation-specific appraisals, such as motivation for an immediate learning activity (Boekaerts, 1999; Volet, 2001). The mediating role of (meta)cognitions and subjective interpretations for understanding group engagement

in a collaborative learning activity cannot be underestimated, especially if the (meta)cognitions and subjective interpretations of all participants are elicited. Whether these alternative epistemological approaches are theoretically compatible and can be integrated in research on motivation in collaborative learning is informed by a parallel, ongoing debate in regard to research on learning and development (e.g., Anderson, Reder, & Simon, 1996; Billett, 1996; Greeno, 1997; Sfard, 1998; Volet, 2001), self-related studies (Martin, 2007) and more recently, research on conceptual change (2007 special issue of the *Educational Psychologist*, Vol. 42, No. 1).

As argued by Mercer (2007) in regard to research on conceptual change, the way forward may be to "devise ways of researching the processes of developing understanding that are sensitive to both the cultural contexts in which learning [in this case, motivation] takes place and to the psychological mechanisms involved when individuals reinterpret the world in the light of new experience" (p. 77). We pursue a similar position in the next section, as we present our case for the conceptual usefulness of combining individual and social processes in research on motivation in collaborative learning.

A CASE FOR COMBINING INDIVIDUAL AND SOCIAL PROCESSES IN RESEARCH ON MOTIVATION IN COLLABORATIVE LEARNING

Our case for combining individual and social processes in research on motivation in collaborative learning is based on two assumptions: first, that groups of students engaged in collaborative learning activities form dynamic, constantly evolving and challenging social systems, and second that individual group members can be conceptualized as interdependent, self-regulating agents with metacognitive capacities. Based on these assumptions, it is claimed that reducing research to individual motivational constructs, even if aggregated at the group level, without paying attention to the significance of emerging and evolving social processes, or alternatively reducing research to the group's actual engagement in the collaborative activity without paying attention to the significance of mediating individual processes should be avoided. Instead, we argue for the importance of considering the complex interplay of concurrent individual and social processes in research on motivation in collaborative learning.

First is the assumption that collaborative learning activities take place in evolving and challenging social systems, which leads to interest in capturing the social, enacted, and process nature of motivation. From this perspective, the group is considered as a social system engaged in a meaningful activity and deploying social processes to regulate interactions toward completion of the activity. As widely documented in the literature on collaborative learning, as well as in microgenetic studies of group dynamics, groups as social systems

can experience disturbances and ongoing challenges. These require coordination of interactions to maintain the system as a whole and to restore engagement.

Second is the assumption that collaborative learning is constituted of interdependent individuals with metacognitive and agentic capacities. From this perspective, research on motivation needs to capture the individual processes that regulate and sustain individual engagement in the joint activity. As documented in the literature on group learning, socioemotional challenges generated during collaborative learning activities force individuals to cope psychologically with their emotions to restore their motivation and engagement. These psychological processes are therefore subjectively adaptive to their social context. This is consistent with the view that individuals who constitute social systems represent self-regulating agents who are concerned, consciously or not, about maintaining their integrity (coping) as well as their role (participation) in the social system, which they constitute. In some cases individual regulation processes can be coordinated with peers, or even mutually shared with the group members.

Next, we present illustrations of studies that attempted to bridge the "cognitive–situative divide" in research on motivation in collaborative learning from different theoretical perspectives or using different methodologies.

ILLUSTRATIONS OF STUDIES BRIDGING THE COGNITIVE–SITUATIVE DIVIDE IN RESEARCH ON MOTIVATION IN COLLABORATIVE LEARNING

Bridging the Cognitive–Situative Divide From Different Theoretical Perspectives

The purpose of this section is to examine empirical work that bridges the cognitive–situative divide between different theoretical perspectives. All these studies combine a focus on group processes and individual accounts of motivation, but the interpretation of these processes is grounded in different theoretical perspectives. The aim is to show that regardless of the theoretical grounding, sociocognitive or sociocultural, research with a combined focus on both psychological and social processes of motivation can enrich our understanding of motivation in collaborative learning.

In their studies on classroom interaction Turner and her colleagues (Turner et al., 1998; Turner et al., 2003; Turner & Patrick, 2004) have considered the role of context as affording or constraining opportunities for individual student motivation. In their studies the individual is seen as embedded in context, but the aim of the research has been to explain individuals' motivation as a function of the learning situation. In a multimethod study of student participation in mathematics classes, Turner and Patrick (2004) studied motivation with an "influence" metaphor in conceptualizing the processes which characterize the relationship between individuals and their context. They focused on teacher discourse and its impact on classroom goals and individual student engagement. In this descriptive study, the data collected included observational field notes and audio recordings of classroom interactions during mathematics lessons, as well as survey data on student goals and perceptions. By observing the same students across 2 years with different math instructors the researchers were able to argue that students' motivation to participate was determined by the interaction of their personal goals with the affordances and constraints on participation created by the teachers' actions. Their analysis shows how individual constructs of motivation interact with the environment and how social interaction influences motivation.

One of Turner and Patrick's data examples shows how teachers' high-level supportive motivational discourse prompts student mastery orientation and emphasizes effort (in a situation where the students explained their homework problems). For example, during a homework check, the teacher answered a student's question about grading this way: "*No, I give you points if you did it, but I can see that you tried. I can see that is almost all done, so I can see that you worked on that. That is what I give you points for and we go over it in class and you need to correct it yourself*" (Turner & Patrick, 2004, p. 1778). With this kind of qualitative data in their 2-year study they were able to show that students interactions with the teacher and the classroom context increased students' engagement and participation from the 1st year to the 2nd. Their data show how student participation in classroom interaction reflects unique interactions between personal factors of individual cognition (e.g., goals) and the opportunities and constraints of the classroom context (e.g., teacher scaffolding). The problematic issue with this kind of approach is that although it provides information about the influence of teachers' actions on student motivation, it is not possible to identify the reciprocal influence of student behavior on teachers from teacher discourse data. Also, the perspective on student engagement is very holistic and the interacting factors of motivation and cognition in student engagement are merged and difficult to identify (cf. Järvelä, Veermans, et al., 2008).

Studies that focus more systemically on interacting peers in social settings have been conducted by Salonen and Vauras and their colleagues (Salonen et al., 2005; Vauras, Salonen, Lehtinen, & Lepola, 2001). They posit that motivation is, in part, a response to various situational demands but that student learning trajectories are formed through ongoing transactions between student and teacher. They view the individual, others in the context, and other characteristics of the context (e.g., norms, values) as all playing an active part in shaping motivation.

In one of their studies, Vauras et al. (2003) investigated shared regulation and motivation of fourth-grade collaborating peers when solving mathematical problems in

a technology-based game environment. Their analyses of high-ability students took the students' individual social and cognitive competencies into account, as well as aspects of the peer interactions and quality of collaboration. Their detailed analyses of peer interactions during the problem-solving activity revealed how a pair of students showed not only self-regulative activity and task orientation (e.g., checking their understanding) but also reciprocal regulation (e.g., giving signals to the partner if they were not ready to move on; Vauras et al., 2003, p. 27). Throughout the collaboration their typical discussions included utterances like "Hey, wait a minute. . . . ," "No, but look at this. It is . . . ," "I have to check. . . . ," and "How so?" They also wanted to check if the other agreed and was ready to move on, for example, "What shall we put on here?" and "Shall we write . . . ?" (Vauras et al., 2003, p. 27).

Vauras and her colleagues' analysis, employing both an individual cognitive perspective and an analysis of social processes, showed that socially shared regulation contributed to high-quality, peer-mediated learning among high-ability students. They noticed that self-regulated activities (e.g., high awareness and regulation of own thinking) guided the two girls' work throughout the sessions. However, in their data it was difficult to interpret the overall regulation of problem solving in the peer interaction by using only the concepts of self- or other-regulation or shared regulation, because the joint activity could not be reduced to mere individual activity and the nature of the shared regulation depended on the type of task or the problem at hand. A limitation to the generalizability of Vauras et al.'s findings, and of detailed case interaction studies in general, is that the context appeared to be "an ideal condition for peer interaction" and therefore did not reflect the more complex real-life situation of students' problem solving.

The contributions from a sociocultural perspective on motivation, by Walker and colleagues (Pressick-Kilborn, Sainsbury, & Walker, 2005; Walker, in press; Walker et al., 2004) avoid the reduction of personal phenomena to social interaction and recognize the agency of the individual. Their studies focus on the process of internalization, which is active, constructive, and transformative (Walker et al., 2004), so that the goals, values, and standards constructed by the learner cannot be considered to be transmitted by others. Rather, goals, standards, and values are actively modified or changed by the learner in the process of internalization. When standards and values have been internalized by a learner they are subsequently externalized in the form of motivated action, behavior, and language, so that internalization may be inferred from these expressions of classroom engagement. The nature and quality of interpersonal relationships between students and their teachers and peers are therefore important in sociocultural perspectives on motivation as they influence the internalization and externalization of motivational standards and values. Interpersonal relations and intersubjectivity are also important for understanding the way thatvad learners and their peers regulate each other's activities, and their motivated engagement in those activities.

Arnold and Walker (2008) examined the impact of an intervention designed to enhance student academic regulatory activities in fifth-grade primary school classrooms. The intervention took the form of a teachers' professional development program that addressed the theory and practice of creating student regulated learning environments, after which the teachers established these environments in their own classrooms over a period of 6 months. The study involved 131 students located across five classrooms in two schools, with two classes in the same school constituting the intervention group and the remaining three classes in the other school forming the control group. Following the intervention, quantitative, and qualitative data were examined for changes in students' metacognitive and cognitive skills, academic achievement, and motivation that were expected to result from the intervention. Quantitative data focused on students' cognition (individual perspective) was obtained via assessment instruments and student self-report surveys administered before and after the intervention. Data focusing on social processes, observation, and the recording of teacher and student discourse, as well as interviews, was used to investigate the nature of teacher scaffolding of student regulated learning, collaborative group functioning and the level and nature of student regulatory discourse.

Their results point to the social context as the developmental source of self-regulation and provide support for the contention that teacher scaffolding, involving an emphasis on collaborative learning and opportunities for coregulation, provided an appropriate context for students to learn and deploy academic regulatory strategies. They noticed that collaborative activities carried out by teachers and students in the classroom facilitated transformative internalization (learning) and externalization (deployment) of coregulatory skills, from which self-regulation could subsequently emerge. Walker and his colleagues' studies (Pressick-Kilborn et al., 2005; Walker, in press; Walker et al., 2004) provide support for the conceptualization of motivation as a fundamentally social phenomenon, with individual motivation emerging from social participation. These studies show that methods such as discourse maps of interactions, observations, and interviews afford insights into the mechanisms by which the social becomes individual through the processes of transformative internalization and externalization. Not examined in Walker and his colleagues' work, however, are the social processes of the group as a whole (the situative angle), because the main focus is on the interactions of individuals that constitute the group. In the final section, we provide an illustration of how individual and social regulation of motivation in collaborative learning can be captured methodologically.

Bridging the Cognitive–Situative Divide Using Different Methodologies

This section illustrates how the cognitive–situative divide can be bridged *methodologically* using different data sources. Each data source can be used to capture both individual and social processes of motivation. Selected data from a study by Järvelä, Järvenoja, et al. (2008) provide the basis for this illustration. The aim of that study was to explore how socioemotional challenges emerging during a collaborative learning activity were regulated at individual and group levels to sustain motivation and complete the task. Three data sources were used, namely, video recording, a specially designed questionnaire, and focus group interviews.

The three-part illustration presented next is based on the collaborative learning activity of one group in a 50-min session. Participants were four preservice teacher education students (two male [Timo, Jukka] and two female [Riina, Henna]) involved in the analysis of a classroom case study.

Video Recording of Actual Group Interactions

Analyses of students' actual social interactions while working on the task (video data) were intended to demonstrate the extent to which the combination of verbal and nonverbal interactions may be used to infer evidence of individual and social regulation of motivation. One short episode (about 5 min) was selected for this illustration as it enables a more fine-grained analysis of individual and social processes. What happened is described first, as recorded on video.

> The group appears to be working smoothly and everyone appears confident to contribute. One member, Henna, tells a story from her early childhood. The other three members laugh and question Henna's ability to remember things from early childhood. Henna gives another example, which the others question again. After this incident, Henna looks a little upset and stops participating in the conversation. Riina takes the initiative of asking everyone in an engaging tone, "How do we comment on this case?" The attention of the group is again on the case, however, the confident atmosphere is not restored immediately. Little by little the group starts joking again. This restores the group discussion and even Henna appears focused on the task again. Group members can be observed laughing at each other's jokes, asking for each other's opinion and supporting each other's ideas. At the end of the whole session, everyone appears confident again and the task is completed. It looks like everyone is satisfied with the group's analysis of the case.

The video data shows how the group's apparent keenness to work on the task was suddenly challenged by a social incident that disturbed the emotional balance within the group, how group members reacted and handled the situation, and how motivation was eventually restored. The point here is that the video data allowed this continuity of related situated events to be scrutinized. Detailed observations of participants' verbal and nonverbal behaviors and social interactions are used to make inferences about their social and psychological processes of motivation. Indicators of meaningful behaviours and interactions include, for example, individual body language, facial expressions, nature and intensity of eye contact, sudden momentary changes in gestures as members relate to each other, and collective movements of members shifting closer or further apart from each other, as well as consistency in verbal and nonverbal interactions at both individual and collective levels.

In this short episode, there were several meaningful indicators of challenges to shared motivated engagement as well as regulation of motivation, for example, when Jukka cocked his eyebrows and leaned backward away from Henna, followed by the other students supporting Jukka's comment, and Henna subsequently turning away from the group. Even though this particularly unsettling incident lasted only about 1 min, there were clear indications, looking at the group members' facial expressions, that everyone had realized Henna's feelings had been hurt. The subsequent verbal contributions that immediately follow, accompanied with a sudden change in body language, highlight that group members were now concerned about the impact of their behaviors and were indirectly trying to make up for their unfortunate earlier comments. This was evident in their softening of their initial negative remarks and their bringing in examples from their own experiences. Such behaviors can be interpreted as evidence of social and individual regulation of motivation to address the socioemotional challenge. Henna's subsequent facial expression and gradual change in body language suggest that she was sensitive to the others' attempts to make up, and made an individual effort to cope with her emotions and ultimately restore her motivation to participate in the group activity.

In regard to this particular episode, it can be argued that the rapidity and effectiveness with which group members collectively and individually addressed the emerging challenge and eventually restored their engagement was due to their prior successful history of shared motivation as a group, as observed before the incident. The video data show limited struggle to restore the positive emotional atmosphere and sense of togetherness within the group. The renewed use of jokes and positive responses to each other's opinions provide further evidence of effective social regulation for continued shared engagement throughout the remaining time of their group activity.

Specially Designed Questionnaire Eliciting Individual Interpretations of Selected Events

The potential of questionnaire data to capture individual and social regulation of motivation is illustrated using the Adaptive Instrument for Regulation of Emotions (AIRE). This instrument (see Järvenoja, Volet, & Järvelä, 2009, for full conceptual grounding and description of its components) is

specifically designed to elicit students' personal goals for an actual collaborative learning activity, their perceptions of socioemotional challenges during that activity, their accounts of individual and group-level attempts to regulate the immediate emotions evoked by these challenges, and their perception of goal attainment.

In the AIRE questionnaire, socioemotional challenges are identified through students' initial ratings of 14 socially challenging situations (scenarios), which were generated after an extensive review of the empirical literature on collaborative learning and group work. The scenarios fall into five broad categories corresponding to differences in personal priorities, styles of working and communication, team work, collaborative processes and external constraints. After rating their experience of the 14 possible social challenges, students identify what they see as the two biggest challenges in their own group, namely, the challenges that triggered the strongest emotions among group members. In regard to the two biggest socioemotional challenges, students then rate the self, co-, and socially shared regulatory processes that were employed for dealing them. In the final section of the questionnaire, students are invited (alongside other questions) to rate how satisfied they are with their experience in that particular group learning activity. The AIRE questionnaire is therefore explicitly designed to obtain data on individual and social processes of the regulation of motivation. The regulatory processes presented for rating are customised around the specific socioemotional challenges that students perceived in their group, so that the questionnaire data best capture students' actual experiences of a current group learning activity.

With regards to the group in the previous illustration, and consistent with the observations of their interactions throughout their learning activity (video data), these students' responses to the AIRE questionnaire revealed evidence of both self- and socially shared regulation strategies. The point is that the questionnaire data "traced" mental processes that were not observable but were nevertheless influential in the construction of motivation at both individual and group levels. Remarkably, all four students identified teamwork activities as the major challenge in their group, and the reason for adopting regulation strategies. Furthermore, three of the four students' ratings of shared regulation items were remarkably similar, highlighting a shared understanding of how the group coped with emerging challenges. Finally, all four students expressed satisfaction with their experience in the collaborative learning activity, with two students fully satisfied and two just satisfied (which included Henna). These findings were consistent with the video data, which revealed an overwhelmingly positive attitude and effective social and individual regulation when needed throughout the whole collaborative learning activity. In sum, it appears that a carefully designed questionnaire can be used to capture individual and social processes of motivation.

Focus Group Interviews Eliciting Group Experiences

The potential of focus group interview data to capture individual and social regulation of motivation is now examined, using as illustration the actual focus group interview conducted with the four students right after their collaborative learning activity. This group interview revealed several meaningful types of individual regulatory processes (determination to remain open, effort to be flexible, reevaluation of own ideas and roles), and shared regulatory processes (engagement in joint decision making, pursuit of common goals). Remarkably, the way individual processes were expressed by students suggests that individual regulatory processes were perceived as shared processes at the same time. This was evident in the use of "we" instead of "I" in most students' statements—for example, "We had this certain level which we wanted to reach and we didn't make it too complicated after we reached that." This was also evident in the students' answers to the interviewers' questions during the group interview, with many instances of several students building upon each other's answers to provide a joint explanation, for example, "First we discussed . . . (one student) . . . but then we decide together that we will choose this case because it sounds the best . . . (second student) . . . yes! (third student)" The similarity of this phenomenon with what was observed in the video data of students' actual interactions while working on the task was quite remarkable. This is to say that when individuals communicate their assumptions, members can add to, continue, agree, or disagree with each other's explanations, allowing the group to construct shared assumptions, and a more comprehensive and accurate interpretation of their situated activity. A critical issue with this type of data, however, is whether they reflect fairly and equally the interpretations of the whole group or just its most vocal members.

In summary, each of the three data sources and methodologies revealed evidence of both individual and social regulation of motivation, and in this respect illustrates how the cognitive–situative divide can be bridged methodologically. By their nature, these data sources tend to privilege access to either individual regulation over social regulation of motivation (e.g., questionnaire data) or social regulation over individual regulation (e.g., video data), which calls for the value of combining findings obtained through different methodologies. In this illustration, the video data showed how shared motivation was successfully initiated, sustained for a while, then challenged and eventually restored through the groups' effective regulatory processes. In addition, the use of the AIRE and the focus group interview revealed how group members, individually and as a group, were able recognize the socially challenging nature of the situation and how they constructed a common motivational grounding for their shared goals. These types of data revealed individual and group interpretations that could not have been extrapolated

from the actual process data. A critical issue with this type of data analysis, however, is for the researcher to remain conscious that these data represent "collections of indicators" of motivation from different data perspective. The combination of individual and social perspectives, therefore, should not lead to overgeneralization. Rather, it presents opportunities for revealing ambiguities and contradictions that are critical to increase validity in data analysis.

SUMMARY AND DIRECTION FOR FUTURE RESEARCH

In this article we proposed that research on motivation in collaborative learning should move beyond the cognitive–situative epistemological divide and combine individual and social processes. Supported by illustrations from recent studies, we suggest the study of motivation as an individual psychological concept embedded within the social, shared, and interactive processes of learning.

One of the major current conceptual challenges is how best to study the social processes of motivation in dynamic, socially challenging collaborative learning activities. A broad review of educational research concerned with motivation reveals a range of assumptions about the origins of motivation and the associated cognitive processes. These include the specific characteristics of a situation or context (Corno & Mandinach, 2004), the sociocultural milieu (McInerney & Van Etten, 2002), the dual psychological and social phenomena (Järvelä & Volet, 2004), and individualistic thoughts (Winne, 2004). Some strong contextual considerations have located motivation outside the individual and claimed that the primary motivators of engagement reside within the tacit collective knowledge that defines communities of practice (Hickey, 2003). Our approach has been to conceptualize motivation as a process of engagement and participation in a social activity, which is situated and dynamic—not decontextualized and static—because it is ongoing, constantly shaped, and reshaped as the activity unfolds.

How can motivation be operationalized and investigated as a combined individual–social phenomenon? And how can the complex, interactive, and multilayered nature of the social context be studied empirically? In spite of advances in conceptualizations of self-regulation and motivation as social and contextual phenomena (e.g., Nolen & Ward, 2008), challenges still remain. There is a risk of oversimplifying these complex psychosocial phenomena in empirical work through a reductionist approach that operationalizes motivation in terms of either individual motivational constructs or social processes of engagement. Theoretical support for an integrative perspective of individual and social regulation can be found in living systems theory (Miller, 1978; Volet et al., 2009). Moreover, a dialogue between researchers grounding their work in sociocognitive and sociocultural perspectives should be pursued in more elaborated ways, in an attempt to address the fundamental issue of where the psychological self ends and the social begins. In our own work, we found that an aggregation of multiple subjective accounts of self-regulation processes, combined with observations of coregulated processes, was invaluable to understanding motivation as a social process.

We are still short of understanding how motivation arises in social contexts, such as collaborative learning. For example, it is not clear from current research why individuals choose to employ particular strategies and how group members or the shared social context stimulate the origin of new motivational and cognitive activity (Winne & Hadwin, 2008). What makes it effective and can it be predicted? The data illustrations in this article were mainly drawn from situations that provided a short timeline of how group members interpreted the situation and the extent to which they seemed to develop a common view of the shared motivational processes. A longitudinal design, similar to the one used by Boekaerts and Minnaert (2006), for example, would enrich the description of students' motivational changes as a function of time, within and across learning episodes, and explain these changes in more detail. The current data illustrations unveiled responses to an evolving social situation, but probes would be needed to elicit why individuals choose particular strategies over others and what it means to use those strategies in the developing collaborative culture of the group. Collaboration between researchers who study individual psychological processes and those specializing in social psychology and group dynamics has the potential to shed more light on this issue.

From a methodological viewpoint, observations or videos are well suited to examine the social construction of motivation and emotions during learning, for example, coregulation (sociocultural perspective). This approach is ideally complemented by interviews, where participants provide explanations for their own engagement in the group dynamics (sociocognitive perspective). Combining data sources and methods of analysis is expected not only to provide a more comprehensive understanding of such psychosocial phenomena but also to unveil possible contradictions, ambiguities, and paradoxes, which a single approach would not reveal (Ercikan & Roth, 2006). In the present illustrations, triangulation of the observations, dynamic questionnaire responses, and interviews provided a way to establish how closely the questionnaire items mirrored students' experiences. Other types of self-report data, such as diaries, journals, and experience-sampling methods, can provide further insight into some of the invisible yet powerful aspects of social dynamics and interactions that cannot be accessed via observational data (Butler, 2006). The point is, following Greeno (2006), that actual recordings of the interactions would provide information about shared and contested goals, power dynamics, and other important aspects of motivation in social context.

In summary, research on motivation has taken new avenues in conceptual and methodological development to

grasp the dynamics of motivation in multiple contexts and thus get closer to actual practices. There are, however, still challenges regarding conceptual clarity and the generation of rigorous empirical designs in field research to study motivation across contexts and over time.

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