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Intra-Individual and Inter-Levels of Metacognition across EFL Writing Tasks of Multi Difficulty Levels

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Abstract

This study investigated the quality of metacognition at its inter-individual level, i.e., socially-shared metacognition, across two collaborative writing tasks of different difficulty levels among a cohort of Iranian EFL learners. Moreover, it examined the correlation between the individual and the social modes of metacognition in writing. The analysis of think-aloud protocols of a number of pre-intermediate and advanced EFL learners revealed instances of episodes in which peers used metacognitive activities at pair level. Besides, comparing think-aloud protocols of tasks indicated more frequent and longer use of socially-shared metacognitive episodes in more difficult writing tasks. The study also found high correlation between the social mode of metacognition in L2 writing and learners' individual metacognition. The pedagogical implications include the provision of learning opportunities in which learners are challenged to exploit metacognitive strategies, such as planning, monitoring, and self-evaluating.

Keywords: Metacognition; Metacognitive strategies; Multi-difficulty level; Socially shared metacognition; Task difficulty

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1. Introduction

Metacognition, i.e. individuals' "thinking about thinking" (Flavell, 1979, p. 906), consists of two constituents, namely knowledge of cognition and regulation of cognition (Brown, 1978; Flavell, 1979; Schraw, Crippen, & Hartley, 2006). Individuals' metacognitive knowledge is the learners' awareness of their own weaknesses and strengths (Flavell, 1979), features of certain tasks (Schraw et al., 2006; Schraw & Moshman, 1995), learning and problem-solving strategies at their disposal, and the appropriate circumstances in which they should be employed (Flavell, 1979). Metacognitive regulation, on the other hand, encompasses individuals' ability to plan their learning activities, monitor their learning process, and evaluate the effectiveness of learning activities and the deployed strategies and techniques (Schraw & Moshman, 1995). Metacognition plays a prominent role in individuals' achievements in educational settings as it reportedly fosters the development of individuals' critical thinking (Magno, 2010) and self-regulation (Schraw et al., 2006) which is a determining factor in learners' academic success (Zimmerman & Bandura, 1994).

The relevant literature has already confirmed that metacognition is prompted by task complexity (Prins, Veenman, & Elshout, 2006), and that metacognitive experience is most affected when tasks are optimally challenging (Efklides, Papadaki, Papantoniou, & Kiosseoglou, 1998).

In language learning, employment of metacognitive strategies can be clearly observed in the writing skill in which learners are required to plan and organize ideas (Angelove, 2001). Metacognition in this skill is characterized by writers' awareness and management of strategies exploited to plan ideas, to monitor the choice of texts in accordance with the aim and the audience of writing, and to modify the generated texts (Davis, 2013). Metacognitive

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strategies are indispensable for learners to successfully complete writing tasks (Dülger, 2011; Kasper, 1997; Raphael, Kirschnet, & Englert, 1986; Victori, 1999), and to create better texts (Bereiter & Scardamalia, 1987; McCromick, 2003).

Traditionally, metacognitive studies have mainly aimed at delineating how individuals employ metacognitive strategies, such as planning, monitoring, and evaluating individual tasks, or how individuals' metacognitive knowledge could be a function of instructional techniques (Iiskala, Vauras, Lehtinen, & Salonen, 2011). Nevertheless, more recently this trend of research has been informed by theories introducing learning as a social process, and researchers have started to investigate the social aspects of metacognition (Iiskala, Vauras, & Lehtinen, 2004; Salonen, Vauras, & Efklides, 2005) and have used the term "socially-shared metacognition" (Iiskala et al., 2004, p. 147) for the metacognitive regulation of joint activities in collaborative tasks that require planning, monitoring, and evaluating. Inspired by Vauras, Salonen, and Kinnunen's (2008) conception of features of a group as a social system, and Efklides's (2008) views regarding the necessity to consider metacognition as set in a social context, such inter-individual level of metacognition can be considered "the most profound social mode of regulation" (Iiskala et al., 2011, p.379) leading behaviors toward the accomplishment of a common goal (Iiskala et al., 2011).

Iiskala et al. (2004) contended that group members regulate and control each other's performance and dynamically "participate in construction of joint cognitive products" (p. 148) while maintaining the interdependence between members in the thinking process required to carry out learning tasks. Thus, planning, monitoring, and evaluating might occur at an inter-individual level in collaborative tasks. According to Fitzsimons and Finkel (2010), although internal standards and processes often result in the initiation of goals, peers

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might cause unconscious initiation of new goal pursuits. They maintained that interpersonal interactions can also have an effect on self-control, and monitoring of "one's extant goal progress and likelihood of future goal achievement" (p. 101).

Despite sound arguments on which social mode of metacognition is anchored, few studies have explored metacognition at inter-individual level in peer and group activities (e.g. De Backer, Van Keer, & Valcke, 2012, 2014, 2015; Iiskala et al., 2004, 2011; Iiskala, Volet, Lehtinen, & Vauras, 2015; Larkin, 2009; Molenaar, Roda, van Boxel, & Sleegers, 2012; Molenaar, Sleegers, & van Boxel, 2014). Iiskala et al. (2004), for instance, demonstrated the existence as well as the possibility of systematic identification and measurement of instances of socially-shared metacognitive processes during collaborative mathematical problem-solving tasks. Having analyzed verbal commutations of pairs to find episodes in which both learners attempted to regulate and monitor each other's cognitive working process, they reported the existence of such inter-personal metacognitive processes especially in more challenging tasks. In Iiskala et al. (2004 & 2011), an episode of socially-shared metacognition is the one in which learners jointly attempt to regulate a cognitive process towards a shared goal. Such episodes include both pupils' regulatory involvement "so that the pupils' reciprocal turns together affected the course of the process" (Iiskala et al., 2011, p.384). Moreover, Iiskala (2004) contended that in socially-shared metacognitive episodes, group members a) consider each other while planning, monitoring, or evaluating, and b) do not merely talk aloud while planning, monitoring, or evaluating their own behavior and instead make attempts to regulate and monitor each other's cognitive working process.

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Iiskala et al. (2011), similarly, reported the employment of socially-shared metacognitive processes among four dyads who were engaged in solving mathematical problems. They asserted that the length of socially-shared metacognition episodes was positively correlated with task difficulty. They also scrutinized the function of such episodes and found that socially-shared metacognitive episodes either facilitated or inhibited problem-solving activities. In a similar vein, Iiskala et al. (2015) delineated the existence of socially-shared metacognitive processes among a small group of learners in asynchronous computer supported collaborative inquiry learning. The results of networked discussion analysis indicated that some episodes of such inter-personal level of metacognition "lasted over an extended period, and they sometimes intertwined or overlapped" (p.78). The results also showed that socially-shared metacognitive episodes mostly inhibited the directions assumed improper.

Employing a multi-method pretest-posttest design entailing the analysis of self-report questionnaires as well as that of think-aloud protocols, De Backer et al. (2012) investigated the role of peer tutoring in learners' metacognitive knowledge and use of metacognitive strategies. They also reported that reciprocal peer tutoring techniques, in which learners alternately played the role of tutor, fostered metacognitive regulation as significant changes were detected in learners' actual metacognitive regulation. Thus, they highlighted the prominent role of social feedback and peers in regulation of cognition.

Molenaar et al. (2012) studied the effects of dynamic scaffolding on social regulation of twenty-eight dyads studying in a computer-enhanced learning environment. The results revealed that scaffolds promoted metacognitive and cognitive activities which are regarded as two aspects of socially-regulated learning. They operationalized metacognitive episodes as "sequences of turns that discuss the same topic and of which at least one turn is a metacognitive

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activity" (p. 320). They also probed the effect of computerized scaffolding on metacognition at intra-group level and discovered that "groups receiving scaffolding showed significantly more intra-group interactions in which the group members co-construct social metacognitive activities" (p. 309).

Despite recent interest in implementing collaborative writing tasks and the advantages they offer (Mancho´n, 2011; Yarrow & Topping, 2001), metacognition at group and pair level in EFL writing task has not been adequately investigated so far. Among the few studies on how metacognition in writing can be socially-meditated is the one conducted by Larkin (2009) who explored the use of metacognitive strategies at pair level in five to seven year-old native speakers involved in collaborative writing tasks. Using a qualitative content analysis of teacher and researcher reflections and structured field notes, Larkin concluded that young children used metacognition intentionally to jointly construct the texts. Inspecting the use of socially-shared metacognition in an EFL context, Jafarigohar and Mortazavi (2017) reported that language learners were able to deploy metacognitive strategies at the inter-personal level to construct texts and such exploitation of metacognitive strategies at inter-individual level was a function of teacher-provided scaffolds. To date, to the best of our knowledge, no study has investigated whether the use of such socially-shared metacognition is affected by factors, such as task complexity. Moreover, whether a significant relation exists between the application of metacognitive strategies at individual level and their employment at peer or group level has not been previously scrutinized in a second/foreign language learning context.

In an attempt to provide empirical evidence on social metacognitive skills in the context of EFL writing, and add to the still scarce body of research on socially-shared metacognitive processes, this study probed the existence of

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socially-shared metacognitive processes across collaborative writing tasks of various levels of difficulty among a cohort of female EFL learners. The study also investigated the relation between the intra-personal and inter-personal levels of metacognition. In so doing, the following two hypotheses were tested:

1) Socially-shared metacognition episodes in the difficult writing task do not significantly differ from those in the easy task in terms of length and number.

2) There is no significant relationship between the participants' individual and socially-shared metacognition.

2. Method

2.1. Participants

Seventy-six female Iranian learners of English (i.e. 38 pre-intermediate learners and 38 advanced learners) in a language institute with an age range of 17 to 38 (M = 26.50, SD = 5.90) participated in this study. To choose 38 homogeneous pre-intermediate learners, the researchers administered the Key English Test (KET) to 73 learners in three intact classes (M = 79.49, SD = 10.54). From among those who had scored one standard deviation from the mean in the KET, 38 were randomly selected. Similarly, the First Certificate for English (FCE) test was given to 67 learners studying in four advance classes (M = 67.34, SD = 6.28). Thirty-eight advanced learners were randomly selected from among those who had scored one standard deviation from the mean in the FCE test.

2.2. Procedure

The participants were trained to verbalize their thoughts while engaging in a writing task. The training included the provision of models and explanations with regard to verbalizing thoughts and creating think-aloud protocols. To provide a practical model, one of the researchers thought aloud, articulating her

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ideas as she wrote a paper. To make sure the tasks presented to learners were of various levels of difficulty, researchers consulted theoretical postulations put forward by Robinson (2001). In a triadic componential framework, Robinson argues that attentional, memory, reasoning, and other information processing demands imposed on the language learner can result in task complexity. Differently stated, Robinson construes task difficulty as a function of cognitive, interactive, and learner factors. He deems cognitively difficult tasks as those including many elements, not referring to here and now, and demanding reasoning. Moreover, according to Robinson (2001), lack of the opportunity to plan prior to the task and paucity of content knowledge contribute to the cognitive complexity of tasks. Interactive factors, as considered by Robinson (2001), consist of participation variables and participant variables, such as power/solidarity. As a final point, learner factors cover learners' affective variables, such as motivation and anxiety as well as aptitude variables, such as proficiency and intelligence.

The reasoning element from the model was selected and manipulated to generate tasks necessitating different amounts of reasoning and thus varying in cognitive difficulty levels. Based on the aforementioned framework, the first task was designed in a way as to include the reasoning; the second task, on the other hand, did not involve the reasoning demand but included the content knowledge privilege to render the task less challenging.

For the first task, the + reasoning one, each participant was then asked to choose one of the three topics and write an argumentative essay which necessitated reasoning and supporting one's stance while thinking aloud and recording their voice. The participants were told to say whatever went on through their minds while doing the individual writing task to generate think-aloud protocols. The think-aloud procedure was carried out for each participant

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individually and in independent sessions by one of the researchers. The think aloud session for each participant was arranged out of their normal class periods.

With regard to the – reasoning task, the learners were assigned to work with a peer from the same proficiency level to write an argumentative essay. Next, two pre-intermediate pairs and two advanced pairs were randomly chosen from among the participants and were asked to embark on another collaborative argumentative writing task. Drawing on Robinson's (2001) conceptualization of task difficulty which considers reasoning as contributing to task complexity, this second writing task was regarded to be of less difficulty as pairs were provided with content in the form of cards including three supporting arguments and three counter-arguments. This exempted the participants from having to reason and to generate content, the knowledge of which has been reported to be among EFL writers' linguistic sources of difficulty (Al Seyabi & Tulukova, 2014). Therefore, the second collaborative writing task, given to only four pairs, was considered to have a lower difficulty level compared with the first writing task.

2.3. Instruments

The researchers transcribed the participants' think-aloud protocols generated during the collaborative writing tasks in order to measure their socially-shared metacognition. These think-aloud protocols were made by dyads who recorded their voice while interacting to co-produce a paper in joint-paper activities. The coding system introduced by Iiskala and colleagues (2004, 2011) was employed to analyze the protocols.

Two coders, the second author and a TEFL PhD candidate, coded the protocols. Prior to the coding sessions, the second coder was briefed on the aim of the study and the theories of the social aspect of metacognition. Moreover,

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she was given a sample of data analyzed for the existence of socially-shared metacognition by Iiskala et al. (2004). Subsequently, the two coders discussed the coding system and worked together to analyze one think-aloud sample. Then, the coders independently coded nine protocols. The inter-coder's agreement was estimated (Cohen's Kappa = 0.79). The differences were resolved through discussion and the rest of the data were analyzed merely by the first coder. To calculate the frequency of the socially-shared metacognitive turns, the researchers tallied the number of turns in socially-shared metacognitive episodes for each pair and obtained a total number.

Besides, think-aloud protocols were used to assess the use of metacognitive skills of the participants during the individual writing task to discover the relationship between learners' inter-personal and intra-personal metacognition. Following classifications of Schraw and Moshman (1995), segments signaling planning, monitoring, and evaluating one's performance were included as instances of metacognition. Twenty-five percent of the gathered data were coded by two coders, the second author and the same second coder who coded the episodes of socially-shared metacognition, and the inter-coder's agreement was estimated (Cohen's Kappa = 0.82). The differences were resolved through discussion, and the rest of the data were analyzed by the second coder. To calculate the frequency of the use of metacognitive skills, the researchers tallied the number of segments reflecting planning, monitoring, and self-evaluating for each learner and obtained a total number.

3. Results

The researchers analyzed think-aloud protocols of pairs to find instances of socially-shared metacognitive processes. On the whole, 15351 turns were coded out of which 7863 cases were identified as socially-shared metacognitive ones. These turns were included in 1256 episodes. An example of an episode coded as a metacognitive episode is presented below:

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Learner 1: I think you are writing the example in the wrong paragraph.
Learner 2: It is wrong? Where should we write the examples so…? Not in the first paragraph? I want [to] give the examples for my idea.
Learner 1: I think examples should be in the body after reasons.
Learner2: Ok. Wait. … I [will] delete it.

The above episode, which consists of four turns, starts with the metacognitive activity of monitoring and is dedicated to one topic. Moreover, learners' reciprocal turns affected the course of the process, and individuals were not merely expressing their own thought aloud while planning or monitoring their own behavior. Therefore, it possesses the features of a metacognitive episode as promulgated by Iiskala et al. (2004, 2011) and Molenaar et al. (2014).

To understand whether socially-shared metacognition episodes in the difficult writing task significantly differed from those in the easy task in terms of length and number, the researchers compared think-aloud protocols of sixteen pairs, eight pre-intermediate pairs and eight advanced pairs, in the easy and difficult writing tasks. The first collaborative writing, in which pairs were not provided with the content, was regarded as the difficult writing task. However, the second collaborative writing task in which the pairs were given cue cards for the content was viewed as the easy task. The think-aloud protocol of each pair in the easy task was compared in terms of the length and frequency of socially-shared metacognition episodes (i.e. the number of the turns in one episode) and the frequency (i.e. the number) of episodes with the protocol of the same pair in the difficult task. Following Iiskala et al. (2011), the total number of turns as well as socially-shared metacognitive ones in think aloud protocols

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produced in both easy and difficult tasks were tallied. Besides, the socially-shared metacognitive episodes including the turns were identified and counted.

In the difficult task, sixteen pairs generated 1712 turns, 1008 of which were coded as socially-shared metacognitive turns in the 264 episodes. In the easy task, on the other hand, 1528 turns were coded out of which 372 were identified as socially-shared metacognitive turns embedded in 116 episodes. In other words, 59% of the turns in the difficult task and 24% of them in the easy task were socially-shared metacognitive ones. A Mann-Whitney U test was run to compare the number of the episodes across the two task difficulty levels. Table 1 below displays the descriptive statistics when difficult and easy tasks were compared in terms of triggering the generation of socially-shared metacognition episodes.

The Mann-Whitney test indicated that the number of the socially-shared metacognition episodes was greater in the difficult task, $U= .00$, $p <.05$, $r = .11$. Next, another Mann-Whitney U test was used to compare the number of turns in episodes across tasks of different difficulty level. The results revealed that the number of turns within each episode in the difficult task (Mdn = 4) was statistically significantly higher than the ones in the easy task (Mdn = 2), $U= 680.50$, $p <.01$, $r = .25$. The first hypothesis stating that the number and length of socially-shared metacognition episodes would not significantly differ across the two levels of task difficulty was thus rejected.

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Table 1

Descriptive statistics: Socially-shared metacognitive episodes in the two

Level of Difficulty	Number	Median	Min	Max	M (SD)
Difficult	16	20	5.00	10.00	7.25 (2.62)
Easy	16	7	15.00	23.00	19.00 (3.36)

Finally, to examine whether a significant relationship existed between socially-shared and individual metacognition, the authors used the Spearman's rho correlation coefficient to examine the possible relationship between the participants' individual metacognition and socially-shared metacognition. The participants' socially–shared metacognition scores gained in the collaborative writing task were assigned to both learners to measure the correlation. A significant relationship was found between the two variables (i.e. individual metacognition and socially-shared metacognition), $r=.90$, $p<.05$, and they shared 81% of the variance. Therefore, the gained results led to the rejection of the third null hypothesis which stated that no significant relationship would be detected between the two levels of metacognition.

4. Discussion

As mentioned earlier, the exploitation of metacognitive processes at an inter-individual level is a relatively new topic within the field of educational psychology, and the social aspect of metacognition is still an under-researched area (Molenaar et al. 2014). Iiskala et al. (2004) viewed the endorsement of socially-shared metacognition as important as that of the individuals' metacognition, arguing that collaborative activities and peer interaction play an

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important role in individuals' learning. They also maintained that learners should be assisted to develop skills to enhance reciprocity and interdependence in pair/group interactions. The inter-personal and the social dimension of writing, acknowledged in recent models of writing, encourage collaboration among learners (e.g., Yarrow & Topping, 2001). There is empirical evidence endorsing the effectiveness of collaborative writing in promoting the quality of learners' essays as well as their self-esteem (Yarrow & Topping, 2001).

The present study contributed to the field by exploring the use of the deepest mode of metacognition (Iiskala et al., 2004) by pre-intermediate and advance learners across collaborative writing tasks of two different levels of difficulty. The first finding is that both pre-intermediate and advanced learners could employ metacognitive strategies at social levels. This indicates that language learners regardless of their proficiency levels were able to plan, monitor, and evaluate activities at pair level when striving to jointly create a text. The findings of the present study with regard to the application of metacognitive strategies, such as planning, monitoring, and evaluating at the inter-individual level are commensurate with the findings of Larkin's study (2009). She reported the manifestation of social level of metacognition when young native speakers were engaged in joint construction of texts.

Moreover, the results extend those by Larkin (2009) as they demonstrate the feasibility of exploiting the social level of metacognition even when language learners are involved in text generation while communicating in L2. The results corroborate the ones obtained by Jafarigohar and Mortazavi (2017) who showed EFL learners were capable of using metacognitive strategies beyond the individual level. The results, hence, illuminate the nature of socially-shared metacognition showing that even when the learners are grappling with the arduous task of communicating in a foreign language to

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construct a text in that language, they are able to engage in this deep level of metacognition. Bergsleithner (2010) construed writing in a second or foreign language as "one of the most complex cognitive tasks that humans have to achieve" (p. 2) since it demands cognitive attentional recourses and processes besides cognitive mental representation processes.

Apparently, both pre-intermediate and advanced language learners were able to deploy regulative strategies at pair level despite task cognitive demands. The results indicated that the ability to regulate peers' metacognitive activities does not demand a high level of proficiency in a language, and as long as learners possess the proficiency enabling them to interact and get their message across, they can get engaged in the deepest level of metacognitive activities (i.e. socially-shared metacognition) in collaborative writing tasks. De Backer et al. (2015) highlighted the necessity of socially-shared metacognition in collaborative learning. Collaborative writing, which requires learners to work together to construct the text, similar to other learning tasks, necessitates metacognitive activities at the inter-personal level.

The results also chime with those from other disciplines investigating the existence of metacognitive activities at inter-individual levels in collaborative tasks. For instance, the results corroborate the findings of Iiskala et al. (2004, 2011, & 2015) who reported the existence of socially-shared metacognitive processes in mathematical problem solving activities.

This study has contributed to the literature by examining the social dimension of metacognition in EFL writing which suffered from a dearth of attention in the literature. The fact that instances of socially-shared metacognitive episodes were detected in EFL collaborative writing tasks has implications for both researchers and instructors. The findings should motivate

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researchers to think of research designs and instructional interventions to examine the ways such inter-personal level of metacognition can be enhanced. Future studies are needed to probe into the ways pedagogical techniques and adjustments can foster the use of socially-shared metacognition. Further studies are also required to investigate how group and individuals' features contribute to and promote the social employment of metacognitive strategies.

The findings, which point to the effectiveness of interactions while writing through metacognitive processes at pair level, can also be an incentive for writing instructors to value collaborative writing tasks. Metacognition has been reported to play an important role in learning a language (ÖZ, 2005), and metacognitive activities, such as planning and monitoring are also known to contribute to the quality of writing (McCromick, 2003). Instances of socially-shared metacognition, viewed as the deepest mode of metacognition (Iiskala 2004, 2011), were detected as learners engaged in jointly creating a text. Hence, instructors can provide learners with opportunities to experience socially-shared metacognition by dedicating a proportion of the class time to collaborative activities requiring negotiations leading to the achievement of a shared goal and more particularly collaborative writing. The findings also yield support to the claims by Iiskala et al. (2011) arguing "it is possible, empirically and systematically, to identify socially-shared metacognition from a large data set of collaborative processes" (p. 389). The relatively high inter-coder agreement in the present study when coders analyzed a number of collaborative writing think-aloud data and the fact that both coders identified instances of using socially-shared metacognitive strategies supports the feasibility of identifying such instances methodically.

The results of this study should also motivate corpus analysts and researchers to analyze the written and oral data of language learners' interaction

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when assigned to interact to achieve a common learning goal in pairs and groups. This can help them to systematically investigate patterns of socially-shared metacognition both qualitatively and quantitatively. The findings of such investigations can illuminate the nature of the social aspect of metacognition in language classes and the instructional circumstances affecting it.

The second finding of the current study is concerned with the relationship between writing task difficulty and the quality and quantity of socially-shared metacognition episodes. Two Mann-Whitney U tests indicated that participants generated more and longer episodes of socially-shared metacognition. This is in line with the findings of Iiskala et al. (2004, 2011, & 2015) who reported that learners in the more difficult mathematical problem solving tasks used more social metacognitive processes per episode. They also stated that more episodes were identified in the more difficult mathematical tasks.

The results concerning the relationship between task difficulty and manifestation of episodes of socially-shared metacognition are also consistent with the studies indicating the activation of metacognition in challenging situations (Prins et al., 2006). This suggests that to trigger metacognition at the inter-personal level, writing instructors should pay extensive attention to the process of selecting collaborative writing tasks in order to make sure the tasks are difficult enough to tap on learners' socially-shared metacognition. They should also ensure the demands of the task would not render it too difficult for the learners to fall back on their metacognitive skills in group (Efklides et al., 1998). Further studies are needed to provide empirical backing for the optimal writing task difficulty levels at which the optimal results concerning social regulation of cognition would be gained. These studies should compare the quality and quantity of socially-shared metacognition episodes when various writing task features are manipulated to gain various challenge level.

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Furthermore, this study found a significant relationship between the two levels of metacognition. These results are in line with the ones by Molenaar et al. (2014) who reported a significant relation between participation in intra-group social metacognitive interaction and metacognitive knowledge. This also has practical implications for practitioners. Instructors can provide learning opportunities in which learners are challenged to exploit metacognitive strategies, such as planning, monitoring, and self-evaluating even in individual tasks. Instructional tools, such as prompts which encourage reflection and self-evaluation and elicit decisions and plans can be utilized to develop metacognition at its individual level (Bannert & Mengelkamp, 2013). Given the significant relationship between the two modes of metacognition as found in this study, it can be reasonably argued that even tasks designed to promote the intra-personal level of metacognition and the employment of metacognitive strategies, such as planning and monitoring can positively impact the growth of skills to apply metacognitive strategies at pair or group level. Therefore, both instructors and material developers should be encouraged to value and aim at devising pedagogical tasks intended to promote the use of metacognitive strategies. Writing material developers can incorporate sections explicitly teaching and modeling the use of planning, monitoring, and evaluating strategies. Books designed to assist learners with the acquisition of writing skills in another language can also indirectly hint to and elicit the metacognitive behaviors.

Finally, despite its contributions to the field, the present study suffered from a number of limitations, indicating the need for further studies to confirm the results. First of all, this study did not explore the function of the episodes in facilitating or hindering groups' problem solving activities. Besides, due to practical constraints, the participants of the present study were selected from

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among adults, making it difficult to make similar claims for younger groups. Further studies are needed to scrutinize more think-aloud samples and delve into the variations in functions of the episode as a result of the optimal level of challenge.

5. References

Al Seyabi, F., & Tulukova, V. (2014). Writing problems and strategies: An investigative study in the Omani school and university context. *Asian Journal of Social Science and Humanities*, *3*(4), 37-48.

Bannert, M., & Mengelkamp, C. (2013). Scaffolding hypermedia learning through metacognitive prompts. In R. Azevedo, & V. Aleven (Eds.), *International handbook of metacognition and learning technologies* (pp. 171-186). New York, NY: Springer.

Bereiter, C. & Scardamalia, M. (1987). *The psychology of written composition*. Hillsdale, NJ: Lawrence.

Bergsleithner, J. M. (2010). *Working memory capacity and L2 writing performance*. *Ciências & Cognição*, *15*(2), 2-20.

Brown, A. L. (1978). Knowing when, where, and how to remember: A problem of metacognition. In R. Glaser (Ed.), *Advances in instructional psychology*, *Vol. 1* (pp. 77-165). Hillsdale: Erlbaum Associates.

Cohen, J. W. (1988). *Statistical power analysis for the behavioral sciences* (2nd Ed). Hillsdale, NJ: Lawrence Erlbaum Associates.

Davis, A. J. (2013). *Effective writing instruction-based classroom practices*. South Yarra, Victoria: Eleanor Curtain Publishing.

[Downloaded from ijal.khu.ac.ir on 2024-04-19]

De Backer, L., Van Keer, H., & Valcke, M. (2012). Exploring the potential impact of reciprocal peer tutoring on higher education students' metacognitive knowledge and regulation. *Instructional Science*, *40*(3), 559-588.

De Backer, L., Van Keer, H., & Valcke, M. (2014). Socially-shared metacognitive regulation during reciprocal peer tutoring: identifying its relationship with students' content processing and transactive discussions. *Instructional Science*, *43*(3), 323-344.

De Backer, L., Van Keer, H., & Valcke, M. (2015). Exploring evolutions in reciprocal peer tutoring groups' socially-shared metacognitive regulation and identifying its metacognitive correlates. *Learning and Instruction*, *38*, 63-78.

Dülger, O. (2011). Meta-cognitive strategies in developing EFL writing skills. *Contemporary Online Language Education Journal*, *1*(2), 82-100.

Efklides, A. (2008). Metacognition: Defining its facets and levels of functioning in relation to self-regulation and coregulation. *European Psychologist*, *13*, 277-287.

Efklides, A., Papadaki, M., Papantoniou, G., & Kiosseoglou, G. (1998). Individual differences in feelings of difficulty: the case of school mathematics. *Journal of Psychology of Education*, *8*, 207-226.

Fitzsimons, G. M., & Finkel, E. J. (2010). Interpersonal influences on self-regulation. *Current Directions in Psychological Science*, *19*(2), 101-105.

[Downloaded from ijal.khu.ac.ir on 2024-04-19]

Flavell, J. H. (1976). Metacognitive aspects of problem solving. In L. Resnick (Ed.*). The Nature of Intelligence* (pp.231-236). Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Flavell, J. H. (1979). Metacognition and cognitive monitoring. *American Psychologist*, *34*, 906-911.

Iiskala, T., Vauras, M., & Lehtinen, E. (2004). Socially-shared metacognition in peer learning? *Hellenic Journal of Psychology*, *1*, 147-178.

Iiskala, T., Vauras, M., Lehtinen, E., & Salonen, P. (2011). Socially-shared metacognition of dyads of pupils in collaborative mathematical problem-solving processes. *Learning and Instruction*, *21*(3), 379-393.

Iiskala, T., Volet, S., Lehtinen, E., & Vauras, M. (2015). Socially-shared metacognitive regulation in asynchronous CSCL in science: Functions, evolution and participation. *Frontline Learning Research*, *3*(1), 78 -111.

Jafarigohar, M. & Mortazavi, M. (2017). The impact of scaffolding mechanisms on EFL learners' individual and socially-shared metacognition in writing. *Reading & Writing Quarterly*, *33*(3), 211-225.

Kasper, L. F. (1997). Assessing the metacognitive growth of ESL student writers. *TESL-EJ*, *3*(1), 1-20.

Kellogg, R. T. (1994). *The psychology of writing*. New York: Oxford University Press

Larkin, S. (2009). Socially-mediated metacognition and learning to write. *Thinking Skills and Creativity*, *4*(3), 149-159.

[Downloaded from ijal.khu.ac.ir on 2024-04-19]

Magno, C. (2010). The role of metacognition in developing critical thinking. *Metacognition and Learning*, *5*(2), 137-156.

Molenaar, I., Chiu, M. M., Sleegers, P. J.C., & van Boxtel, C.A.M. (2011). Scaffolding of small groups' metacognitive activities with an avatar. *Journal of Computer Supported Collaborative Learning*, *6*(4), 601-624.

Molenaar, I., Roda, C., van Boxtel, C., & Sleegers, P J. C. (2012). Dynamic scaffolding of socially-regulated learning in a computer-based learning environment. *Computers & Education*, *59*(2), 515-523.

Molenaar, I., Sleegers, P., & van Boxtel, C. (2014). Metacognitive scaffolding during collaborative learning: A promising combination. *Metacognition and learning*, *9* (3), 309-332.

Mancho´ n, R. (2011). Writing to learn the language: Issues in theory and research. In R. Mancho´n (Ed.), *Learning-to-write and writing-to-learn in an additional language* (pp. 61-84). Amsterdam: John Benjamins.

ÖZ, H. (2005). Metacognition in foreign/second language learning and teaching. H. U. *Journal of Education*, *29*, 147-156.

Prins, F. J., Veenman, M. V. J., & Elshout, J. J. (2006). The impact of intellectual ability and metacognition on learning: New support for the threshold of problematicity theory. *Learning and Instruction*, *16*, 374-387.

Raphael, T.E., Kirschner, B.W., & Englert, C.S. (1986). *Students' metacognitive knowledge about writing.* East Lansing, MI: Michigan State University, Institute for Research on Teaching.

[Downloaded from ijal.khu.ac.ir on 2024-04-19]

Robinson, P. (2001). Task complexity, task, difficulty, and task production: Exploring interactions in a componential framework. *Applied Linguistics*, *22*(1), 27-57.

Salonen, P., Vauras, M., & Efklides, A. (2005). Social interaction: what can it tell us about metacognition and coregulation in learning? *European Psychologist*, *10*, 199-208.

Schraw, G., Crippen, K. J., & Hartley, K. (2006). Promoting self-regulation in science education: Metacognition as part of a broader perspective on learning. *Research in Science Education*, *36*(1-2), 111-139.

Schraw, G., & Moshman, D. (1995). Metacognitive theories. *Educational Psychology Review*, *7*(4), 351-371.

Vauras, M., Salonen, P., & Kinnunen, R. (2008). Influences of group processes and interpersonal regulation on motivation, affect and achievement. In M. Maehr, S. Karabenick, & T. Urdan (Eds.), Social psychological perspective. *Advances in motivation and achievement*, Vol. 15(pp. 275-314). New York: Emerald Group

Victori, M. (1999). An analysis of writing knowledge in EFL composing: A case study of two effective and two less effective writers. *System*, *27*(4), 537-555.

Yarrow, F., & Topping, K. (2001). Collaborative writing: The effects of metacognitive prompting and structured peer interaction. *British Journal of Educational Psychology*, *71*(2), 261-282.

[Downloaded from ijal.khu.ac.ir on 2024-04-19]

Zimmerman, B. J., & Bandura, A. (1994). Impact of self-regulatory influences on writing course attainment. *American Educational Research Journal, 31*, 845–862.

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