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# **Group Creativity: An Interpersonal Perspective**

by

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## AUTHOR'S DECLARATION

At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award, without prior agreement of the Graduate Sub-Committee.

Work submitted for a research degree at Plymouth University may not form part of any other degree either at the University or at another establishment.

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## **Group Creativity: An Interpersonal Perspective**

### **ABSTRACT**

**C**reativity has received significant interest in variety of fields and disciplines with a major focus on individual level creativity. As more and more achievements started originating from groups, researchers turned their attention to creativity on group level. Current thesis explores the group creativity as well as flow experience in collaboration. It explores the group creativity phenomena and its correlates in different contexts, age groups and cultures. The overarching aim of the thesis is to extend our knowledge on group creativity and contribute to open questions in the field such as - How does (group) creativity develop? Which interpersonal and motivational processes play a role in group creativity? How can we measure group creativity? In four studies, the present research found that (social) flow can be explained by empathy and motivation of group members as well as domain of performance. To build on these results, the role of interpersonal processes in group creativity was explored with adults. While closeness was found to benefit group creativity, combination of closeness with perspective taking was harmful on creative performance. Moreover, with an aim to understand how group creativity develops, this thesis explored group creativity in children and adolescents from England and Turkey. Across these two samples, group creativity performance developed with age and advances in social perspective coordination was one mechanism explaining that development. Additionally, study conducted with Turkish children found task cohesion as a facilitator of group creativity. Major similarities in findings obtained from two samples implicated cultural universality in development of group creativity, however, slight differences in results pointed to the possibility of culture-specific differences in processes underlying group creativity. Finally, the current thesis contributed to literature by adopting and validating a collaborative story writing method as a promising measurement of group creativity. Overall, the studies presented in this thesis illustrate the role that interpersonal and motivational process play in group creativity practices of different age groups and cultures. Findings lead us to the next steps on the adventurous discovery of group creativity.

## LIST OF TABLES

Table 2.1	Internal reliability for SMS-II and FSS-2 subscales .....	45
Table 2.2.	Correlations among study variables and flow .....	48
Table 2.3.	Factor Analysis with Sports Motivation Scale .....	51
Table 2.4.	Hierarchical Regression Analysis predicting flow .....	55
Table 3.1	Perspective taking and closeness means according to condition.....	84
Table 3.2	Correlations among study variables and group creativity .....	84
Table 4.1	Group creativity and study variables means for age groups .....	112
Table 4.2	Correlations among study variables and group creativity .....	113
Table 4.3	Hierarchical Regression Analysis predicting group creativity .....	114
Table 5.1	Group creativity and study variables means for age groups .....	141
Table 5.2	Correlations among study variables and group creativity .....	142
Table 5.3	Hierarchical Regression Analysis predicting group creativity .....	143

## LIST OF FIGURES

<b>Figure 1.1.</b>	<b>Amabile's Componential Model of Creativity .....</b>	<b>5</b>
<b>Figure 1.2.</b>	<b>Input-Process-Output model of work group innovation .....</b>	<b>8</b>
<b>Figure 1.3.</b>	<b>Cultural framework of group creativity .....</b>	<b>12</b>
<b>Figure 2.1.</b>	<b>Total flow means according to domain and cohort .....</b>	<b>52</b>
<b>Figure 2.2.</b>	<b>Internal and external motivation according to domains.....</b>	<b>53</b>
<b>Figure 2.3.</b>	<b>Interaction plot of flow and empathy for domains .....</b>	<b>56</b>
<b>Figure 3.1.</b>	<b>Rory's Story Cubes .....</b>	<b>79</b>
<b>Figure 3.2.</b>	<b>Inclusion of the Ingroup in the Self Scale .....</b>	<b>81</b>
<b>Figure 3.3.</b>	<b>The effect of perspective taking and closeness on group creativity</b>	<b>86</b>
<b>Figure 4.1.</b>	<b>Mediation Analyses for age on group creativity .....</b>	<b>115</b>
<b>Figure 5.1.</b>	<b>Group creativity ratings according to age and condition .....</b>	<b>140</b>

## LIST OF CONTENTS

<b>Acknowledgements</b> .....	<b>I</b>
<b>Author’s Declaration</b> .....	<b>II</b>
<b>Abstract</b> .....	<b>III</b>
<b>List of Tables</b> .....	<b>IV</b>
<b>List of Figures</b> .....	<b>V</b>
<b>CHAPTER 1: GENERAL INTRODUCTION</b> .....	<b>1</b>
<b>Definition of Creativity</b> .....	<b>2</b>
<b>From Individual to Group Creativity</b> .....	<b>3</b>
<b>Group Creativity</b> .....	<b>6</b>
Sociocognitive Approaches .....	<b>6</b>
Sociocultural Approaches .....	<b>9</b>
<b>Processes in Group Creativity</b> .....	<b>13</b>
<b>Open Questions in Group Creativity</b> .....	<b>19</b>
<b>How Can We Measure Group Creativity</b> .....	<b>20</b>
<b>Is Group Creativity Domain Specific or Domain General</b> .....	<b>23</b>
<b>How Does Creativity Develop</b> .....	<b>25</b>
<b>How Does Culture Affect Creativity</b> .....	<b>26</b>
<b>Research Aims</b> .....	<b>28</b>
<b>CHAPTER 2: SOCIAL FLOW IN PERFORMANCE ARTS</b> .....	<b>31</b>
<b>Flow and creativity</b> .....	<b>32</b>
<b>Motivation and Social Flow</b> .....	<b>36</b>
<b>Empathy and Social Flow</b> .....	<b>39</b>
<b>Domain and Social Flow</b> .....	<b>41</b>

<b>Research Aims .....</b>	<b>41</b>
<b>Method.....</b>	<b>42</b>
Participants .....	42
Procedure.....	43
Measures.....	43
<b>Results.....</b>	<b>46</b>
<b>Discussion .....</b>	<b>57</b>
<b>CHAPTER 3: CREATIVITY IN CONNECTEDNESS: CLOSENESS AND PERSPECTIVE TAKING IN GROUP CREATIVITY .....</b>	<b>68</b>
<b>Closeness and Group Creativity.....</b>	<b>70</b>
<b>Perspective Taking and Group Creativity .....</b>	<b>72</b>
<b>Closeness and Perspective Taking in Group Creativity .....</b>	<b>74</b>
<b>Group Output Variable .....</b>	<b>75</b>
<b>Research Aims .....</b>	<b>76</b>
<b>Method.....</b>	<b>76</b>
Participants .....	76
Design and Procedure.....	76
Experimental Manipulation.....	77
Experimental Task.....	78
Measures.....	80
<b>Results.....</b>	<b>82</b>
<b>Discussion .....</b>	<b>87</b>
<b>CHAPTER 4: DEVELOPMENT OF GROUP CREATIVITY: THE ROLE OF INTERSUBJECTIVITY AND INTRINSIC MOTIVATION .....</b>	<b>95</b>
<b>The Development of (Individual) Creativity .....</b>	<b>96</b>

<b>Peer Collaboration and Group Creativity .....</b>	<b>96</b>
<b>Peer Collaboration and Intersubjectivity.....</b>	<b>98</b>
Social Perspective Coordination.....	99
Transactive Communication.....	100
<b>Intrinsic Task Motivation .....</b>	<b>101</b>
<b>Research Aims .....</b>	<b>103</b>
<b>Method.....</b>	<b>103</b>
Participants .....	103
Design and Procedure.....	104
Measures.....	105
<b>Results.....</b>	<b>111</b>
<b>Discussion .....</b>	<b>116</b>
<b>CHAPTER 5: GROUP CREATIVITY DYNAMICS IN CHILDREN AND ADOLESCENTS .....</b>	<b>127</b>
<b>Culture and Group Creativity.....</b>	<b>127</b>
<b>Culture and Social Perspective Coordination .....</b>	<b>129</b>
<b>Culture and Intrinsic Motivation .....</b>	<b>130</b>
<b>Cohesion and Group Creativity .....</b>	<b>131</b>
<b>Research Aims .....</b>	<b>132</b>
<b>Method.....</b>	<b>133</b>
Participants .....	133
Design and Procedure.....	134
Experimental Manipulation.....	134
Measures.....	136
<b>Results.....</b>	<b>138</b>
<b>Discussion .....</b>	<b>145</b>

<b>CHAPTER 6: GENERAL DISCUSSION</b> .....	<b>158</b>
<b>Social Flow</b> .....	<b>159</b>
<b>The Role of Empathy and Motivation in Social Flow</b> .....	<b>160</b>
<b>Domain Specificity in Social Flow</b> .....	<b>161</b>
<b>Implications</b> .....	<b>162</b>
<b>Group Creativity in Adults</b> .....	<b>164</b>
<b>Group Creativity in Children</b> .....	<b>168</b>
Development of Group Creativity .....	168
The Role of Social Perspective Coordination .....	169
The Role of Intrinsic Motivation .....	171
The Role of Cohesion .....	174
The Role of Culture .....	176
<b>Methodological Considerations</b> .....	<b>178</b>
<b>Concluding Remarks</b> .....	<b>180</b>
<b>APPENDICES</b> .....	<b>182</b>
<b>Appendix 1.1</b> .....	<b>182</b>
<b>Appendix 1.2</b> .....	<b>183</b>
<b>Appendix 2</b> .....	<b>184</b>
<b>REFERENCES</b> .....	<b>191</b>

***When the consciousness of individuals, instead of remaining isolated, becomes grouped and combined, something in the world has been altered.***

Durkheim (1951, p.310)

## CHAPTER 1 – GENERAL INTRODUCTION

How do groups create something new together? How do brainstorming groups in organizations arrive at new ideas, how do collaborating dancers create new moves and jamming musicians generate new tunes? The aim of my doctoral dissertation is to investigate (some of) these phenomena, typically known or referred to as group or collaborative creativity. Although there is still an on-going debate about how to define creativity, it has been commonly referred to as the ability to create objects, artifacts, or thoughts, which are original and useful (Sternberg & Lubart, 1996). Traditionally, creativity has been mostly investigated from an individual perspective, with an aim to understand what features characterize the creative person, in terms of personality traits, cognitive abilities, or intellectual capacity (Sternberg & Lubart, 1999). For a long time, there has been little interest in group creativity or social processes in creativity (Paulus & Nijstad, 2003). This gap in knowledge about group creativity is particularly a problem (both in theoretical and applied research) since creative achievements are increasingly coming from the collaboration within groups or teams (West, 2002). Only relatively recently has there been a shift in the focus from the individual to the group creative process (Sawyer, 2007). Research is now starting to provide more detailed knowledge on creativity but our understanding about the key concepts that facilitate (or hinder) creativity in groups is still limited (George, 2007). Moreover, further research on group creativity does not only have theoretical but also applied relevance. Our world is changing and creativity is becoming a key aspect in adapting to and dealing with this accelerated change.

### **Definition of creativity**

Although studies in the field of creativity have roots in 1940s and 1950s, the use of the term dates back much further, to times of ancient Greek. Most Greek philosophers thought that creativity originates from divine sources with one exception; Aristotle abandoned divine thinking and he attributed creativity to human nature (Niu & Sternberg, 2006). Whilst creativity is a term that is used by laypeople on a daily basis, there has been much debate on how to define creativity in scientific research. There are over one hundred definitions of creativity stemming from various disciplines (Parkhurst, 1999). Many recent articles or books often cite standard definitions of creativity from 1980s or 1990s, but the debate as to what creativity is and how it can be best defined scientifically is far from resolved (Runco & Jaeger, 2012).

Early psychological research on creativity mostly focused on individual differences in creativity, specifically on what makes creative people different from others (Barron, 1968; Galton, 1870, cited in Hennessey, 2003). Contemporary research was initiated by E. Paul Torrance, a leader figure in creativity research, who was best known for developing the Torrance Test of Creative Thinking (TTCT; Torrance, 1974). Torrance (1966, p. 6, cited in Kim, 2006) defined creativity as follows

“A process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficulty; searching for solutions, making guesses, or formulation hypotheses about the deficiencies: testing and retesting these hypotheses and possibly modifying and retesting them; and finally communicating the results.”

Contemporary approaches to creativity are thus more extensive than classical definitions and do not differentiate as sharply between “creative” and “non-creative” people. In those approaches, creativity is often accepted as a capacity that everyone has to some extent (Amabile, 1996). Unlike the person-oriented traditional views of

## Chapter 1 – General Introduction

creativity, recent research approaches creativity more from a product-perspective; that is they focus on a creative product or outcome rather than a creative person. Amabile (1996) defined creativity as “the production of novel and useful ideas in any domain” (p.1). Woodman, Sawyer, and Griffin (1993) provided a parallel definition from organizational context: “We define creativity at work- an individual-level construct- as an approach to work that leads to the generation of novel and appropriate ideas, processes, or solutions.” (p.293). Overall, novelty and usefulness are the two most commonly referred aspects in definitions of creativity (Sternberg & Lubart, 1999). According to Runco and Jaeger (2012) this bipartite definition is almost standard now, and creativity is accepted as a combination of originality (novelty) and effectiveness. Although most definitions encompass this originality (novelty) aspect, effectiveness can take various forms depending on the field, such as usefulness, fit or appropriateness (Runco & Jaeger, 2012).

Throughout this dissertation, I have adopted this standard definition of creativity. In line with previous research, I have defined creativity as the joint novelty and appropriateness of ideas or products (e.g., Amabile, 1996) that could be developed by individuals working independently or groups working collaboratively. This definition emphasizes that although originality is a fundamental aspect for creativity, it will not be sufficient as long as the creative ideas/products are not also useful in some ways. As Runco stated (1988, p.4): “Originality is vital, but must be balanced with fit and appropriateness.”

### **From Individual Creativity to Group Creativity**

Early scientific interests in creativity was mostly occupied with individual level creativity and focused on the idea of distinguishing creative personalities and identifying their unique qualities (Galton, 1870, cited in Hennessey, 2003). The rapid expansion of psychological research interest in creativity actually started with Guilford

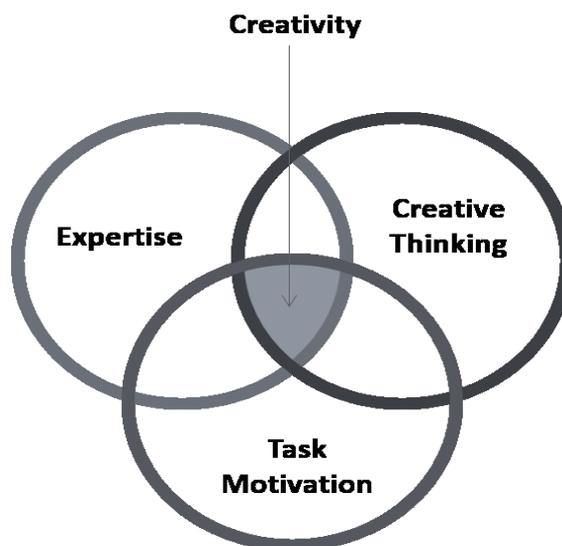
## Chapter 1 – General Introduction

(1950) following his presidential address at the American Psychological Association Conference that emphasized the necessity to study creativity (cited in Simonton, 2000). Following the influential talk, the 1960s and 1970s saw a boom in creativity research. From those days a bias emerged towards individuals as the source of creativity and the exclusion of external factors and environmental dynamics in the creative process (Hennessey, 2003). In his article on three paradigms of creativity, Glaveanu (2010) defines this era in creativity as “the I-paradigm- the creative person”. The I-paradigm is the successor of the He-paradigm, the period where pre-psychological thinking equated creativity with the idea of the creative genius. However, during the I- paradigm, the individual “normal” person, rather than geniuses, became the unit of analysis (Glaveanu, 2010).

The focus of this thesis is the creativity of groups rather than individuals, and hence the unit of creative analysis is the group. This is commensurate with a further paradigmatic shift in the direction of the research on group creativity. According to Glaveanu (2010), we are witnessing another paradigmatic shift from “I” (individual) to “we” (group) creativity. This shift in the creativity research started with the consideration of social factors in creativity (Amabile, 1996).

Amabile’s (1996) componential theory of creativity is one of the most influential theoretical frameworks in individual creativity (see Figure 1.1). According to this framework, creativity originates from three major components: Expertise (domain-relevant skills), creative thinking, and strong (intrinsic) task motivation. The expertise component is domain specific and covers memory, knowledge and technical skills for a specific (creativity) domain. For example, knowing how to read music, to play an instrument, and to keep rhythm would be considered important expertise to be creative in music. Creative thinking and task motivation are domain general components. Possessing the expertise is not enough, unless the individual also has creative thinking

skills which will allow him or her to consider novel approaches (Amabile, 1996). Creative-thinking related processes include various idea generation techniques or thinking styles, such as the ability to use a wide range of information and being flexible within categories while synthesizing information. Task motivation lies at the heart of this model. As Amabile stated (1996, p.7); “Although the two skills components determine what an individual is capable of doing in a given domain, it is the task motivation component that determines what that person actually will do.” She regards task motivation as mostly intrinsic motivation, doing something for the pleasure of doing it, which is associated with high levels of creativity, whereas extrinsic motivation (doing something for rewards or avoiding punishment) is associated with a decrease in creativity (Amabile, 1996).



*Figure 1.1.* Amabile’s Componential Model of Creativity (1996)

According to Glaveanu (2010), Amabile’s (1996) model marked the beginning of social creativity, creativity that is formed by interaction and collaboration, and it also set the stage for research on group creativity (Paulus & Nijstad, 2003). Social creativity places creativity within a context and acknowledges the social processes that shape it, such as collaboration between individuals. Although frameworks like the Componential

## Chapter 1 – General Introduction

Model are valuable in terms of their holistic approach, it still focuses on individual creativity and cannot necessarily be generalized to the group level. For instance, it may sound ideal to form groups with highly creative individuals, but there are some studies pointing that when those individuals work together their creative output can end up being less than would have been expected from their individual creativity levels (Taggar, 2001). Therefore, group creativity is best understood in the light of frameworks specifically developed for social-interactive contexts. Group creativity emerges from a social process where individuals in the group combine their creative skills, knowledge and perspectives into group-level creativity (Tiwana & Mclean, 2005).

### **Group Creativity**

Groups creating together have been given different names in the theoretical and empirical literature and how they create together has been a topic in different research fields including experimental psychology, social psychology as well as the organisational context. Some researchers focused on the individual member contributions in group context (Scott & Bruce, 1994), some focused on group processes and contextual influences (Paulus & Dzindolet, 1993) and some investigated the interaction between individual-level and group-level processes (Taggar, 2002).

So far, three main terms have emerged in group creativity research: social creativity, group creativity, and collaborative creativity (Glaveanu, 2011). Social creativity is a more general umbrella term and defines creativity within the social context (Amabile, 1996; Glaveanu, 2010; 2011; Hennessey, 2003). Group creativity (or team creativity) is mostly associated with sociocognitive approaches employed in (experimental) psychology while collaborative creativity is generally studied by sociocultural approaches common in education research, qualitative psychology, communication studies, and performing arts (Glaveanu, 2011).

**A. Sociocognitive Approaches**

Sociocognitive theories approach many phenomena, including creativity, from an experimental perspective. In this approach, creative products are thought to be emerging from the minds of individuals who are affected by other individuals (Smith, Gerkens, Shah & Vargas-Hernandez, 2006). Creativity is believed to originate from individual cognitive processes. It can be identified as an output or a product, and therefore it can be measured. Typically quantitative measures of creativity are preferred. Researchers within this approach use experimental laboratory settings and they focus on detailed analyses of social and cognitive processes occurring in short time spans of measurement, and the terms “creativity” and “innovation” are used synonymously (Paulus & Nijstad, 2003).

Sociocognitive theories mostly investigate group creativity with componential models. For instance, according to Paulus and Nijstad (2003), group members, group processes and the context are the main elements of the group creativity process. An important sociocognitive theory was formulated by West (2003) who focused on creativity and innovation implementation in groups at work. According to West's (2003, p.245-246) “Input-Process-Output Model of Work Group Innovation” (Figure 1.2), the task that the group has to do (e.g., providing health care, selling mobile phones, producing advertisements), the composition of the group (e.g., differences in culture, age, gender) and organization context of the group that is shaping the demands and climate for environment (e.g., manufacturing, health service, advertisement company) are the main inputs of the model, whereas number of the innovations and innovation quality (e.g., magnitude, novelty and effectiveness) are the main outputs of the model. Group processes (e.g., participation of members, support for innovation, safety, leadership) are mediating the relationship between inputs and outputs. West's model is

very comprehensive and covers most of the factors that have been studied and found effective in group creativity research.

Another recent sociocognitive model of group processes as well as group creativity is the Motivated Information Processing (MIP-G) model (Bechtoldt, De Dreu, Nijstad & Choi, 2010; De Dreu, Nijstad, Bechtoldt & Baas, 2011). The MIP-G model

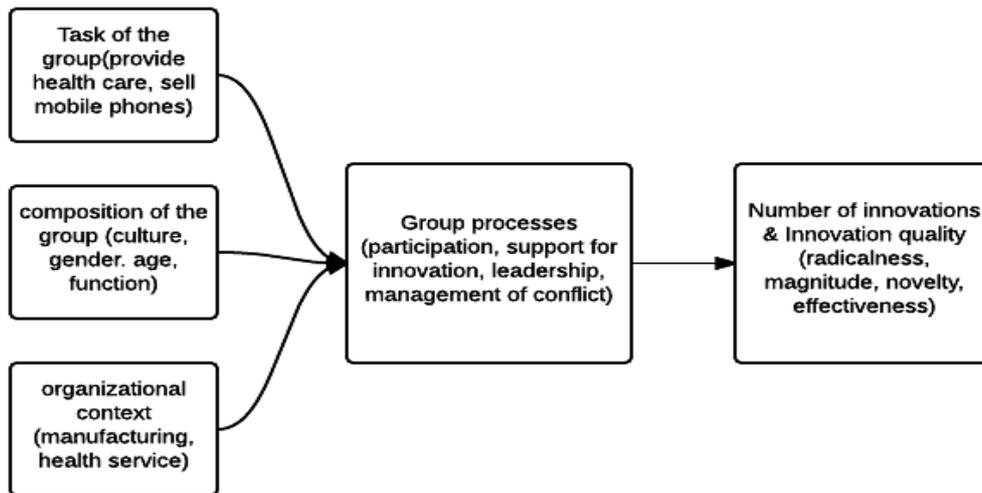


Figure 1.2. Input-Process-Output Model of Work Group Innovation (West, 2003)

builds on the view of groups as information processors and combines cognitive and motivational aspects of group decision making (De Dreu, Nijstad & Knippenberg, 2008) as well as group creativity (Bechtoldt et al., 2010). According to MIP-G, information processing at both individual and group levels can be either shallow and heuristic or more deliberate and systematic. In systematic information processing, attention is given to available and new information, additional information is searched and that information is communicated and integrated in a deliberate manner. When individuals engage in group information processing they are driven by either epistemic or social motivations. *Epistemic Motivation* is the willingness to put effort to achieve a thorough, rich, accurate, and critical understanding of the world by engaging in

## Chapter 1 – General Introduction

systematic information processing (De Dreu et al., 2011). When group members have high epistemic motivation, they feel more committed to the task and they expand their efforts to reach the best group outcome or group decision. The MIP-G postulates that information processing depends also on group members' social motivation: whether they are pro-self (i.e., interested in their own outcomes) or prosocial (i.e., interested in collective outcomes). Overall, the MIP-G model argues that while social motivation affects the type of information that group members attend to (i.e., self or collective), epistemic motivation increases efforts to reach, encode and retrieve new information (De Dreu et al., 2008). A central prediction of the model is that collective success in creativity is most likely in groups with high epistemic motivation and high prosocial motivation (De Dreu et al., 2011). Similar to West's (2003) model, MIP-G is a very comprehensive model that displays most of the factors that have been shown to affect (group) creativity in previous studies.

The main advantage of sociocognitive models of groups is that they give room to test hypotheses by allowing controlled experiments to be conducted and intervention studies to be developed on the basis of these experiments' results. On the other hand, the main disadvantage of these models, especially in the organizational context (i.e., West, 2003), is that they emphasize the cognition of individuals more than the interaction of the group (Glaveanu, 2011). In other words, they underestimate the social essence of the group creativity context and the social processes during group members' interactions. Nevertheless, both of the two models discussed above are very enlightening representations of some of the factors affecting the group creativity process.

### **B. Sociocultural Approaches**

The main difference between sociocognitive and sociocultural approaches is that sociocultural approaches accept creativity as occurring at both individual and group

## Chapter 1 – General Introduction

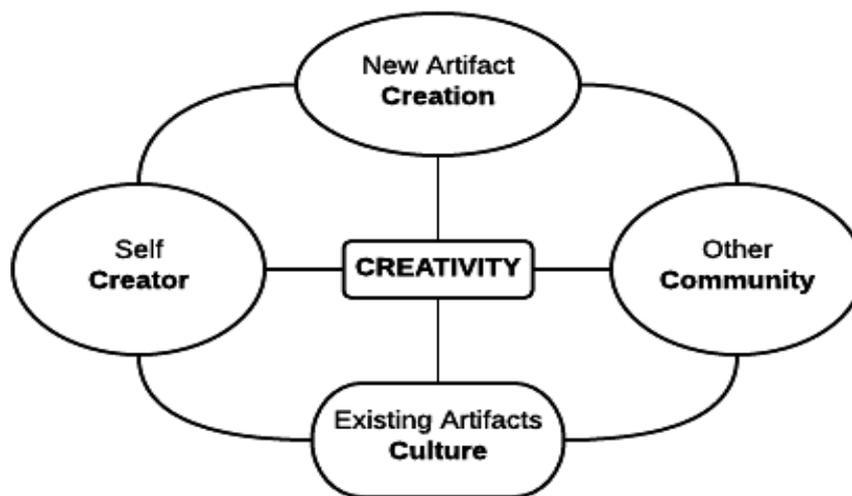
levels. In sociocultural approaches, creativity is not only understood on the group basis but also within the broader macro-context, as a social and cultural phenomenon (Glaveanu, 2011). Although interdependence of the individual and others is central in these approaches, the role of the individual is not underestimated either. Collaborative creativity is considered as a long-term process which can take place in various mediums including online platforms (De Laat & Lally, 2004). Moreover, creativity is considered as more than just cognition and more attention is paid to its socioemotional, motivational, cultural and identity elements. Qualitative methods and field observations, which provide detailed and verbal data, are the common methodology adopted in these approaches.

Unlike sociocognitive approaches that have been used heavily in creativity research in various fields, sociocultural approaches are fairly recent. To fill this gap in the literature, inspired by Vygotsky (1960/1997) and Winnicott (1971), Glaveanu (2011) formulated the Shared Representational Resources Model (SRRM), and defined creativity as a socio-cultural psychological process. According to this model, creativity is based on dialogues, cultural symbolic materials, and intersubjectivity of person and community. Both individual and group creativity occurs in a representational space that combines the inner space (self) and external life (community) together with symbolic resources in our interactions. Specifically, the creativity process encapsulates the birth of a new artefact (creation) from the interplay between the self (creator) and other (community). Creativity lies at the heart of these three constructs, and all these four inter-connected constructs are initiated from existing artefacts (culture), which at the end leads to new artifacts (creation) (see Figure 1.3). Glaveanu (2011) proposed the model for both individual and group level creativity and stated: “In a collaborative situation individuals use symbolic resources intrinsic to their particular system of knowledge and, through communication, generate new and useful artifacts (creative

## Chapter 1 – General Introduction

outcome) within a representational space of the group” (p.13). In a group context, individuals are driven by their already existing cultural schemes, which are called *personal representational spaces*. During collaboration, individuals communicate and share their personal spaces to build a *common representational space*. The combination of perspectives, experiences and ideas in collective settings is never a smooth process, conflicts arise and group members begin to realize their *unique representational space*. By sharing and working on these unique spaces they slowly develop and change the common representational space as well. Eventually, a *new representational space* with new creative ideas emerges from the group, which enriches the representational spaces of both group and individuals (Glaveanu, 2011).

Glaveanu (2015) expanded the SRRM into the “perspectival model of creative action”. In this recent model, he focused on the critical roles of perspective making and perspective taking. He argued that the key to combining representational spaces lies in adopting multiple different perspectives on a particular idea or problem. In this new framework, perspective taking is not just referred to as the cognitive skill of putting oneself into another’s shoes (Falk & Johnson, 1977; Grant & Berry, 2011), but also as creative action orientations. Glaveanu (2015) illustrated this creative action orientation with the classic brick problem; when we are asked to come up with different ways to use a brick, the conventional perspective would be using it as a building material, whereas a nonconventional perspective would be proposing to use it as a weapon. Hence, leaving behind the conventional perspective and moving to different ideas is the key process in creativity, a process that can differ between and even within societies (Glaveanu, 2015). Differences in perspectives are based on differences in social backgrounds, and the process of formulating new perspectives requires adopting the perspectives others (Glaveanu, 2015).



*Figure 1.3.* Cultural framework of creativity (Glaveanu, 2010)

A current example of empirical research that adopted the sociocultural approach to understand group creativity is a study conducted by Vass, Littleton, Miell and Jones (2008). They explore how peer collaboration would nourish the collaborative creative writing of children and how children are collaborating in different stages of writing. The researchers were particularly interested in catching moments of “collaborative flow”, defined as creative collaborations where there is use of only one single voice (i.e., combining and blending all other individual voices). They observed ongoing classroom activities of selected pairs of children aged 7-9 over a one year period through video and audio records taken in literacy classes. Twenty-four same-sex children with matching abilities participated. The authors found that all of the sections of their writing included emotional content which played an important role in the collaborative creative process of children. Vass et al. (2008) also concluded that collaborative creativity is a complicated process including various processes, and collaborative flow moments were one of the key processes. Overall, this research is a good illustration of the sociocultural

perspective since the study only aimed to describe processes involved in collaborative creativity without focusing on the creative outputs.

Both sociocognitive and sociocultural models contribute to our understanding of creativity in groups, however none of them is perfect. The sociocognitive approach is challenged by the high emphasis put on individual cognition, while the sociocultural approach takes into account variety of constructs which makes it difficult to investigate within experimental research designs. In order to understand how creativity occurs through social interactions, a more inclusive, systematic approach, which addresses both person-related processes and group-related processes and which can also be empirically tested, is needed. The general aim of this thesis is to combine different aspects of sociocultural and sociocognitive perspectives to find a common ground and to assess the concept of group creativity more holistically

### **Processes in Group Creativity**

As mentioned above, theories of group creativity are mostly inspired by sociocognitive input-process-output (IPO) models which are developed in the team work literature (West, 2003; West & Anderson, 1996). IPO models connect group inputs, processes and outputs and highlight how various factors including group member characteristics, group structure, group climate, as well as cognitive, social and motivational processes contribute to group creativity (Hulsheger, Anderson & Salgado, 2009; Paulus, Dzindolet & Kohn, 2012; West, 2003). According to Hulsheger et al.'s (2009) meta-analysis, of all the variables identified to play a role in the creativity of groups, group process variables were the most significant. A combination of creative members with creative group processes lead to the best creative group outputs (Pirola-Merlo & Mann, 2004). But what qualifies as “creative group processes”? In the remainder of this section I will discuss the some of the main cognitive, interpersonal,

motivational and behavioural factors that have been shown to underlie creative group processes (Kozlowski & Ilgen, 2006).

**Participative safety.** Participative safety is sometimes referred to as group climate (Pirola-Merlo & Mann, 2004) and includes two components: participation in decision making and psychological safety (Hulsheger et al., 2009). Participation in decision making refers to how much group members can have a room to state their ideas and suggestions freely. More participation in group decision making is associated with higher task commitment (West & Anderson, 1996). According to Edmondson (1999, p.355), psychological safety is “a shared belief that the team is safe for interpersonal risk taking.” When individuals feel safe in their group, they can participate freely and may even feel encouraged to contribute unusual or risky ideas. A strong positive relationship was found between psychological safety, team learning and overall performance (Edmondson, 1999). The general team climate is also a positive predictor of group creativity (Bain, Mann & Pirola-Merlo, 2001).

**Cohesion.** There is a long history of examining the role of cohesion for group performance (Hulsheger et al., 2009). Although there is no strict consensus over its definition (see Kozlowski & Ilgen, 2006, for various definitions), cohesion is generally conceptualized as a multidimensional construct including interpersonal attraction between group members, task commitment, and group pride (Festinger, 1950). Overall, cohesion has a positive influence on group performance and creativity (Hulsheger et al., 2009; Mullen & Copper, 1994; West & Wallace, 1991). However, some mixed findings have been reported as well. Janis’s (1972) work on groupthink (or premature group consensus) showed that group cohesion can increase conformity and inhibit dissent in the group. Groupthink is especially dangerous for group creativity as it would prevent members from rejecting or modifying accepted ideas and hence would block the creative process (Mumford, Scott, Gaddis & Strange, 2002). Jaussi and

## Chapter 1 – General Introduction

Dionne (2003) found that cohesion is positively related to groups' creative performance if groups consist of members with high levels of intrinsic motivation, whereas it is negatively related to creativity in groups with low levels of intrinsic motivation. Therefore, as suggested by Paulus et al. (2012) cohesion can have either positive or negative effects. Or, as some researchers proposed, the relationship between group cohesion and creative performance might be curvilinear (Woodman et al., 1993). Gross and Martin (1952) distinguished between two types of cohesion: task cohesion (commitment to group goals or tasks) and interpersonal cohesion (group member's attraction/ liking of their group) (cited in Kozlowski & Ilgen, 2006). Differentiating between different types of cohesion and examining their effect on group creativity has the potential to resolve the inconsistencies reported in the literature (Craig & Kelly, 1999).

**Conflict.** One of the natural consequences of being in a group environment is the clash between ideas and rise of tension due to disagreements. There are two main types of conflicts; task and relationship conflict (Jehn, 1995; Hulsheger et al., 2009). Task conflict refers to “disagreement among team members about the content of the tasks being performed, including differences in viewpoints, ideas and opinions.” (Jehn, 1995, p.258). Relationship conflict refers to interpersonal disagreements between members that are caused by social or emotional reasons (Jehn, 1995), such as members disliking each other, some members feeling annoyed, or any sort of emotional tension (Jehn & Mannix, 2001). Similar to cohesion, research is inconclusive as to whether conflict is beneficial or detrimental for groups (Hulsheger et al., 2009). Some research noted the positive role of task conflict on groups' creativity and argued that it fosters discussion and generation of new ideas (Shalley & Gilson, 2004; West, 2002), while others claimed the opposite (Kurtzberg & Mueller, 2005). According to Anderson, De Dreu and Nijstad (2004) task conflict benefits group creativity only to moderate degree.

**Task Orientation.** Task orientation has been described as “a shared concern with excellence of quality of task performance in relation to shared vision or outcomes” (West, 1990, cited in Hulsheger et al., 2009, p.1130). Being an adaptive, well-functioning team requires members to work well together, to enjoy each other’s contributions, and to collectively strive for a better outcome. All of these behaviours are characteristics of task orientation (Burke, Stagl, Salas, Pierce & Kendall, 2006). In team settings, members can be assigned to disjunctive tasks (each member is responsible for different components of the task) or to additive tasks (the overall task is the sum of individual members’ contributions as in brainstorming) (Paulus et al., 2012). Although disjunctive tasks require a more complicated coordination process, synchronization between members and a strong task orientation is very important for achieving creativity in both types of tasks (Paulus et al., 2012). Information exchange and effective communication are two important processes essential for establishing task orientation (Hulsheger et al., 2009; Paulus et al., 2012). According to Shalley (2002), task orientation is the equivalent of intrinsic motivation the group-level.

**Reflexivity.** Reflexivity is defined as “the extent to which team members overtly reflect upon the groups’ objectives, strategies, and processes and adapt them to current or anticipated endogenous or environmental circumstances” (West, 1996, p.559, cited in De Dreu, 2007). Group reflexivity is a valuable process for idea generation as it facilitates better exchange of ideas and pushes for more reflection on them (Paulus & Yang, 2000). Reflexivity can take the form of questioning, reviewing, evaluating, discussing, and adaption (Maccurtain et al., 2010) and it is associated with increased innovative success in groups (De Dreu, 2002).

**Perspective Taking.** Perspective taking is an important skill for any kind of social interaction (Davis, 1983). According to Parker, Atkins, and Axtell (2008), perspective taking is an active process that: “occurs when an observer tries to

## Chapter 1 – General Introduction

understand, in a non-judgmental way, the thoughts, motives, and/or feelings of a target, as well as why they think and/or feel the way they do” (p. 151). The significance of perspective taking for group processes and outcomes is established (see Ku, Wang & Galinsky, 2015, for a review). For instance, Falk and Johnson (1977) showed that groups composed of members with high perspective taking skills had greater cooperation, better communication, more trust, and satisfaction. Some researchers suggest that perspective taking has cognitive, affective and perceptual components, which are not empirically but rather conceptually related (Galinsky, Magee, Inesi & Gruenfeld, 2006). According to Grant and Berry (2011), perspective taking mediates the relationship between prosocial motivation and individual-level creativity: While intrinsic motivation drives the novelty aspect of individual creativity, perspective taking is more likely to contribute to the usefulness of individual creative outputs. In a pioneering study by Hoever, Knippenberg, Ginkel and Barkema (2012) three-person teams were assigned to a creative problem solving task and had to produce a creative plan to improve a hypothetical theatre. Results showed that diverse teams generated more creative plans only when they were required to take others’ perspectives. In other words, perspective taking moderated the effect of diversity on group creativity (Hoever et al., 2012). Relatedly, information exchange (a potential result of perspective taking) was found to be a positive contributor of group creativity (Hargadon & Becky, 2006).

**Flow experience.** Csikszentmihalyi (1975) originally proposed the flow concept on the basis of the many interviews and observations he conducted. Csikszentmihalyi (1990) described the flow experience as follows: “When in flow people are so involved in an activity that nothing else seems to matter: the experience itself is so enjoyable that people will do it even at a greater cost, for the sheer sake of doing it” (p. 4). Flow can be experienced in a wide range of activities, from doing sports to performing various kinds of arts (Csikszentmihalyi, 1993). Csikszentmihalyi (1975)

## Chapter 1 – General Introduction

suggested that there are nine dimensions to the flow experience: There must be an equilibrium state between challenge and skill; in other words one must feel competent with one's skills to overcome the challenge of the activity. Actions and awareness of the action should merge so that the person is doing the activity spontaneously rather than deliberately thinking about it. A person should possess clear goals about the activity, should receive unambiguous feedback about how s/he is performing, and should maintain complete concentration on the activity. Moreover, the person should experience a sense of control over the activity without being too aware of putting control, and should lose awareness of time. Finally, the person should feel being autotelic meaning that the action itself should be rewarding (Csikszentmihalyi, 1993).

Flow, as a key process in optimal performance, might be a significant contributor to creativity. However, there is a scarcity of research about flow's relation to cognitive abilities including creativity (Landhäuser & Keller, 2012). Flow has been found to increase performance in various domains like sports (Jackson, Thomas, Marsh, & Smethurst, 2001), dance (Hefferon & Ollis, 2006), or music (Byrne, MacDonald & Carlton, 2003; McDonald, Byrne & Carlton, 2006). MacDonald et al. (2006) experimentally investigated the relation between creativity and flow and found that flow was positively associated with creative outputs as rated by experts.

Although flow is traditionally an individual-level concept, there has been recent attempts to conceptualize it in social settings as well. Walker (2010) identified the concept of social flow and stated that social flow shares the same basic conditions with individual flow (e.g., the balance of challenge and skills), but it is not equivalent to individual flow. Individual flow is more likely in situations where individual performance is decisive even though individuals have to work together. However, if group collaboration is decisive in performance, then social flow is more likely to occur (Walker, 2010). Sawyer (2003) explored the concept of social flow in creative group

performance, terming it “group flow”: “a collective state of mind (...) a peak experience, group performing at its top level of ability” (p. 43) which “cannot be reduced to psychological studies of the mental states or the subjective experiences of the individual members of the group” (p. 46). Group flow helps groups to achieve a collective mindset and optimal group performance. In that sense, it could also be a potential facilitator of group creativity. However, no research has explored its role in collaborative creativity context yet.

### **Open Questions in Group Creativity**

The central (and idealized) view of group creativity is of a group of people coming together to produce something that no one has produced before and for which none of the individuals in the group could produce on their own. As discussed above, collaborative creativity can be conceptualized as consisting of several important processes and factors. Moreover, group creativity is influenced by various individual member characteristics, task and context characteristics, and is shaped by the general cultural setting. In recent years, creativity research has made a great advancement in understanding the finer details of this complicated subject; complicated enough to be labelled as a black box by Kurtzberg and Amabile (2001). However, much remains to be understood about group creativity. Overall, divergent thinking, creativity training, creativity assessment, personality traits of creative people, and intrinsic motivation are topics that have been intensely debated and studied in individual creativity research (Baer & Kaufman, 2005). To step up collaborative creativity research to the next level, some of the challenges associated with both individual and group level creativity research should be acknowledged and explored with further research. In the next section, I will discuss some of the relevant challenges and open questions that are waiting to be answered in (collaborative) creativity research.

## I. How Can We Measure (Group) Creativity?

**Divergent Thinking.** Since the 1960s, measurement of creativity was mostly influenced by Guilford's (1967) approach which equated creativity with divergent thinking. Individual creativity measurement relied heavily on Guilford's creativity test (Guilford, Merrifield & Wilson, 1958, cited in Hickey, 2001) as well as Torrance's (1974) unusual uses task (asking participants to generate unusual uses for ordinary objects like a brick), and Torrance's Test of Creative Thinking (TTCT; 1987). Indicators of divergent thinking were also adopted for measuring group creativity (Paulus & Dzindolet, 2008). Specifically, these tasks assess creativity in terms of fluency (i.e., total number of ideas generated), flexibility (i.e., how many different categories the ideas belong to), elaboration (i.e., whether the ideas are elaborated/detailed enough), and originality (i.e., how infrequent and usual are these ideas). This is why many group creativity researchers define group creativity as "divergent thinking in groups as reflected in ideational fluency." (Paulus, 2000, p.238).

The most popular divergent thinking technique used in group creativity research is the classic brainstorming procedure developed by Osborn (1963, cited in Rietzchel, De Dreu & Nijstad, 2009). In brainstorming sessions, participants are asked to generate as many ideas as they can while not thinking about fear of criticism or judgement. Brainstorming relies heavily on ideational fluency and the quantity of ideas is seen as superior to quality. Although brainstorming usually takes place in groups, it can be performed by individuals as well (Rietzchel et al., 2009). The belief that group brainstorming is superior to individual brainstorming has been quite popular for a long time, but empirical research has actually found this not to be the case (e.g., Connolly, Routhieaux, & Schneider, 1993; Diehl & Stroebe, 1987; Mullen, Johnson, & Salas, 1991). Several explanations have been offered for understanding the weaknesses of

## Chapter 1 – General Introduction

brainstorming. According to Diehl and Stroebe (1987), the critical problem with brainstorming is “production blocking”, which occurs when group members wait for their turn to contribute, and that waiting period interferes their idea generation (cognitive interference). Another reason is motivation losses that take place in brainstorming groups; some group members lower their performance as a result of comparing themselves with less productive members (Paulus & Dzindolet, 1993). According to Rietzchel et al. (2009), despite the problems associated with brainstorming in group contexts it should not be discarded. As more ideas are generated in group than individual contexts, the chance to generate original ideas increases. In a study by Rietzchel, Nijstad & Stroebe (2006) students were asked to brainstorm either in groups or individually. After the session they were required to select the best ideas from the pool of ideas they generated. Results showed that although individuals generated more ideas than groups, there was no association between selection efficiency and quantity of ideas generated; efficiency was only due to probability of generating original ideas. Hence, brainstorming has the advantage of allowing groups to produce many ideas, with the chance that some of them will be creative.

**Problem Solving.** Although less common than brainstorming, problem solving is another frequently used measurement technique in group creativity. In this method, groups collectively offer a solution to a problem without actually solving it. The solutions that are creative and can actually solve the problem are the desired ones and they are subject to standard criteria of creativity; novelty and usefulness (Davis, 2009). For example, Shalley (1991) asked participants to respond creatively to a series of problems that a human resources manager of a steel manufactory company is facing. Participants were provided brief descriptions of the manager role. Their creative solutions were rated by independent raters on novelty and appropriateness, using the Consensual Assesment Technique (Amabile, 1996).

**Consensual Assessment Technique.** Amabile (1982; 1996) proposed the consensual assessment technique as an alternative to divergent thinking measures of creativity. Amabile (1982) gave two main reasons as to why she found divergent thinking tests are not appropriate to measure creativity. First, she criticized creativity tests for not having a clearly defined assessment procedure for their emphasis on ideational fluency and suggested that in divergent thinking tests the originality of an idea is confused with infrequency. Second, she argued that although these tests claim to be based on objective scores, in the end they rely on scorer's intuitions about what is creative and hence, they are not free from subjective judgements (Amabile, 1982). According to the consensual assessment technique, the most valid way to measure and evaluate creativity would be using domain experts' global and subjective assessments, rather than using an objective checklist. Judges are called experts because they need to be relied upon and capable of judging a particular task in that particular domain (Amabile, 1982; 1996). Interrater reliability between experts is particularly critical in this technique (e.g., it should be greater than .70) as it stands for construct validity (Amabile, 1982). After the individual ratings, a composite creativity score can be calculated by averaging different creativity dimensions (Zhou & Shalley, 2010). One big advantage of the consensual assessment technique is that it can and has been used in various creativity tasks including artistic ones (e.g., making collages, paintings), verbal tasks (e.g., writing stories, poems) and also in problem solving tasks (e.g., generating ideas for products), and it is possible to use this technique with diverse samples, such as children, artists, and students (Amabile, 1996; Zhou & Shalley, 2010).

To summarize, there are different measurement and assessment procedures in group creativity. However, measures of divergent thinking (e.g., brainstorming) dominate the field and they largely reflect the ideational aspect of creativity (i.e., fluency, flexibility, originality). On the other hand, problem solving tasks are more

faithful to the bipartite definition of creativity as they try to emphasize the usefulness aspect as much as novelty (Davis, 2009). The consensual assessment technique is usually used with problem solving, artistic, and verbal tasks (Zhou & Shalley, 2010). Although there is no consensus over which technique is better, some researchers claim that no matter what task is used to evaluate creativity, the consensual assessment technique should always be included as it is a more robust way of understanding creativity since it measures the actual creative performance rather than creativity skills or traits (Baer & McKool, 2009).

## **II. Is Group Creativity Domain Specific or Domain General?**

Among all the topics and debates on creativity, none has been more controversial than the question of whether creativity is domain specific or domain general (Baer & Kaufman, 2005). Proponents of domain specificity argue that a person's creativity in one domain cannot be generalized to other domains (Baer, 1998; Baer, 2010; Sullivan & Ford, 2010), whereas advocates of domain generality propose that a person who is creative in one domain will be creative in all domains (Plucker, 1998). According to Silvia, Kaufman and Pretz (2009), the side taken in the domain specificity vs. generality debate is strongly associated with the measurement approach taken. Studies focusing on creative products favour domain specificity (e.g., Baer, 1993), while studies focusing on the creative person (e.g., Plucker, 1998; Torrance, 1967) prefer domain generality (De Dreu, 2010)

If creativity is domain general, this would suggest that a jazz musician, a chef, and a product designer sharing the same sets of creative processes, traits, attitudes, motivations, and thinking styles and that any training program facilitating creativity in a particular domain would affect creativity across the board. If creativity is domain specific, we would have to define each domain according to its own specific set of

## Chapter 1 – General Introduction

creativity antecedents and would have to define specific training programs for each domain. In the end, according to some researchers, the distinction between domain generality and specificity does not really matter for fostering creativity; however, a hybrid theory would be better, particularly for educational purposes (Plucker & Beghetto, 2004, cited in Silvia et al., 2009). Plucker and Beghetto (2004) proposed such a hybrid approach to resolve the issue and argued that creativity can be both domain specific and general; its level of specificity might change with the social context and with development from childhood to adulthood (cited in Silvia et al., 2009).

Baer and Kaufman (2005) attempted to develop another hybrid model which they called “Amusement Park Theoretical (APT) Model of Creativity”. Using the analogy of an amusement park, the model defines creativity through different levels of specificity; it starts from the domain general level and moves into domain specific segments. At the first level of the model, certain sets of factors must exist, such as intelligence, motivation and environment, in order to create any kind of creative work (e.g., similar to the basic requirements to get into an amusement park like transportation, ticket). At the second level, broader theme areas that a person can be creative in, such as art or science, would be differentiated (e.g., once you arrived to the park you have to select the type of park you want to see). At the third level, the distinction within domains gets finer, such as choosing music or painting within the art domain (e.g., once you selected the type of park you also have to select the particular park to go). At the final level, micro-domains come into play and specific requirements of these micro distinctions are being taken into account. For example, within the music domain, one can choose to play the piano, and playing the piano requires the reading of piano notations but it does not require reading drum notations (e.g., options to select from once you are in amusement park).

Although hybrid approaches to the domain generality vs. specificity debate are helpful, they are not resolving the matter. In the end, we are still unclear about which traits of creativity are general to all domains (Silvia et al., 2009). Another important point to consider is that the research on domain issue has focused on individual creativity and there is no research comparing domain specific achievements in group creativity. Therefore, there is urgent need of research for understanding whether the domain of creativity makes a difference in the creative performance of groups.

### **III. How Does Creativity Develop?**

Similar to many psychological abilities, creativity is expected to change with age. According to Lubart and Sternberg (1998), developmental changes in individual creativity are driven by changes in cognition, changes in personality and motivation, and changes in environment. Cognitive changes include intellectual processes such as problem finding, problem solving, divergent thinking, and using insight. Changes in personality and motivation includes increased tolerance to ambiguity, increases in the personality trait openness to experience, as well as increases in risk taking and increased individuality, and changes in achievement motivation. Changes in environment include transformations associated with life style, such as decreased income, increased responsibilities, or changes associated with historical time (Lubart & Sternberg, 1998).

General trends in development of individual-level creativity research indicate an increase in creativity across childhood and adolescence (Gardner, 1982). Nevertheless, views on the development of creativity has not been settled yet due to mixed findings regarding peaks and slumps observed during different phases of development (Charles & Runco, 2001). The first distinctive trend that was observed was the decline of creativity at around age 6 (Daugherty; 1993; Smith & Carlsson, 1983; Torrance, 1968; Urban, 1991) which was seen as a result of adaptation to the schooling system

(Torrance, 1968). That decrease is followed by a steady increase in individual creativity until fourth grade (approximately age 9-10), after which creativity decreases. This period is hence called “the fourth grade slump”. Researchers suggested that the fourth grade slump could again be caused by conformity pressure that students perceive in schools, which causes them to be hesitant in revealing their full creative potential (Lau, Li, & Chu, 2004). Torrance (1967, cited in Claxton, Pannelis & Rhoads, 2005) proposed that the increased peer pressure felt at that age could also cause the fourth grade slump. However, the fourth grade slump was not observed in all studies. In Smith and Carlsson’s (1983, 1985) longitudinal research creativity peaked at ages 10 and 11 and declined at age 12. After age 12 a steady increase was observed followed by a peak at age 16. On the other hand, Claxton et al., (2005) did not observe significant changes in creativity of children in terms of divergent thinking, from fourth, sixth and ninth grade. Overall, these results confirm that creativity progresses with age, but the mixed findings do not allow us to conclude a specific trend of development. Moreover, most of these studies adopted divergent thinking measures. According to Runco (2014) this is problematic as divergent thinking measures not actual creativity, but rather creative potential. Not focusing on actual creativity or creative acts in everyday life results in missing out important details about the development of creativity (Kaufman & Beghetto, 2009).

#### **IV. How Does Culture Affect Creativity?**

Yet another controversial topic in creativity research is the role of culture and whether or not creativity has a universal definition (Csikszentmihalyi, 1997; Plucker & Runco, 1998). Some researchers argued that there are cross-cultural differences in the understanding of creativity (Frank, 2001; Lubart & Sternberg, 1998; Niu, & Sternberg, 2001), while others argued for a universal perception (Guilford, 1975; Plucker &

## Chapter 1 – General Introduction

Runco, 1998). The potential influence of culture on creativity is based on the fact that culture influences *what* is expressed, *who* expresses it, *how* it is expressed, as well as what *function* creativity plays and what *consequences* it bring for the particular society (Ludwig, 1992). According to Lubart and Sternberg (1998), culture causes variations in conceptualization, expression, and quantity of creative activity. Conceptualization differences observed in western and eastern societies showed that participants from western societies believe that creativity revolves around originality and non-conformity. In eastern societies, creativity is rather seen as modification or adaptation instead of non-conformity (Rudowicz, 2003). When it comes to the expression of creativity, some societies (e.g., Indonesia) value artistic creativity (Rudowicz, 2003), while others (e.g., Turkey) welcome creativity in science and technology (Oner, 2000).

Empirical studies with creativity tasks also confirmed that culture may play a role in the expression of creativity. Goncalo and Stew (2006) analysed the effects of cultural orientation (individualism and collectivism) and task instructions (coming up with either creative or practical solutions) on the group creativity of adults. They did not find a main effect of cultural orientation; however, they found a significant interaction between cultural orientation and task instructions. Groups with an individualistic orientation produced more creative results than groups with a collectivistic orientation only when they were instructed to produce creative solutions. Bechtoldt and colleagues (2010) explored group creativity in both Dutch and Korean samples. They manipulated creativity norms by priming either originality or appropriateness and found that Dutch groups (individualistic culture) valued the originality aspect of creativity more than they valued the appropriateness aspect whereas Korean groups (collectivist culture) did the reverse. Such cross-cultural differences might also apply to children from different cultures; that is, children in collectivist cultures and children in individualistic cultures

might display different profiles of collaborative creativity, a question that has not been explored so far.

As demonstrated by the research and theories reported above, culture has a profound effect on creativity in various ways. Nevertheless, cross-cultural research is much more complex than simple eastern-western comparisons and these broad comparisons are giving us a scattered look at potential cross-cultural variations. Moreover, the lack of culture-specific theories on creativity and related variables, as well as the problem of language that can be observed in translation of measures and also in evaluation of creativity (i.e., the use of western measurements), are critical weaknesses of cross-cultural studies in creativity (Rudowicz, 2003). Understanding cultural dynamics of creativity is needed more than ever, in a time of change and globalisation.

### **RESEARCH AIMS**

The general aim of this thesis is to understand the process of group creativity and variables involved in this process. I have examined this topic in four empirical studies with groups from different domains, different cultures and with different ages.

The group creativity research literature is dominated by research focusing on understanding factors differentiating individual creativity from group creativity and how the characteristics of the group or task influence creativity (Bechtoldt et al., 2010). However it is the group process variables which play the key role in group creativity (Hulsheger et al., 2009). Accordingly, my first aim was to explore that important part of the puzzle; the role of key group-level processes in group creativity. I was particularly interested in understanding the role of intersubjectivity in group creativity context and I explored this phenomenon through its different conceptualizations (i.e., empathy, perspective taking, social perspective coordination, transactive dialogue,

## Chapter 1 – General Introduction

meta-communication) throughout four empirical studies. Moreover, building on Amabile's (1996) componential model, I also looked into the role of individual member's motivation in group creativity process throughout these empirical studies.

In Chapter 2, I investigated social flow experience in three artistic creative domains (dance, orchestra, and musical theatre), eventually to gain an understanding about processes involved in group creativity. Particularly, I focused on empathy and motivation and explored their role in social flow experiences of the different domains. These investigations allowed me not only to assess variables influencing experience of social flow but also to examine the topic of domain specificity vs. domain generality in a large collaborative creativity context.

Chapter 3 continued exploring the puzzle by looking at the roles of closeness and perspective taking in an experimental group creativity setting. Building on MPI-G model, perspective taking was conceptualized as a source of epistemic motivation, whereas closeness was a source of social motivation. Both closeness and perspective taking were manipulated experimentally and that allowed me making (tentative) suggestions about their causal effects on group creativity products.

Creativity, like other cognitive-developmental abilities, is expected to increase with age. Although this expectation is generally confirmed, research on developmental differences in group creativity has not received much attention in the literature. In order to fill that gap, Chapter 4 explored developmental changes observed in group creativity practices of children and adolescents. Specifically, intersubjectivity which was investigated through social perspective coordination, transactive dialogue and meta-communication, was proposed as the precursor of group creativity achievements. Moreover, intrinsic task motivation's role for group creativity process of children and adolescents was also explored.

## Chapter 1 – General Introduction

Culture has been acknowledged to have a profound effect on creativity, yet the specifics of its effect have not been fully understood and one important reason is the complexity of conducting cross-cultural research (Rudowicz, 2003). Previous research demonstrated the role of culture in adults' group creativity (Bechtoldt et al., 2010; Goncalo & Staw, 2006). However, we still do not know if collaborative creativity performance of children and adolescents differ by culture. Chapter 5 explored how culture might influence creative collaborations of children and adolescents from a non-western culture, namely Turkey. Therefore, the first aim of the Chapter 5 was to explore if findings of Chapter 4 would be replicable in another culture. The second aim was to understand how manipulation of group dynamics (i.e., cohesion) would influence group creativity outcomes of children and adolescents. Overall, studies reported in Chapter 4 and Chapter 5 contributed to the puzzle by exploring key social-cognitive and motivational factors affecting group creativity processes and outputs in minors from different age groups and cultures.

One limitation that has been repeatedly observed in group creativity literature is the extensive reliance on divergent technique procedures such as brainstorming. It is a problematic trend particularly because the results gathered through divergent thinking tasks speak more to a person's creative traits or potential rather than actual creativity (Baer & McKool, 2009). Understanding creativity through tasks that mimic real-life creativity activities and that rely on the consensual opinion of experts in that specific field seems a promising venue for measurement (Amabile, 1996). In order to assess group creativity in an internally and externally valid way, I have developed a collaborative writing task that was assessed with the Consensual Assessment Technique. Across Chapter 3, Chapter 4 and Chapter 5, I measured collaborative creativity with the collaborative story writing task and relied on experts' ratings which were gathered with the consensual assessment technique.

## Chapter 1 – General Introduction

Overall, the investigations presented in this thesis will contribute to our knowledge on how creativity occurs in groups, how correlates of creativity (i.e., flow) are experienced in collaborative settings, what factors facilitate collaborative creativity, how it develops with age, and whether culture and domain play a role in group creativity. I will discuss, evaluate, and critique the findings of these four studies in the final Chapter.

## CHAPTER 2 – SOCIAL FLOW IN PERFORMANCE ARTS

Csikszentmihalyi (1975) originally proposed the flow concept on the basis of the many interviews and observations he conducted. Flow is described as being highly involved in activity and performing it for the sake of its pleasure (Csikszentmihalyi, 1990, p. 4). Csikszentmihalyi (1975) suggested that there are nine dimensions to the Flow experience: There must be an equilibrium state between challenge and skill; in other words one must feel competent with one's skills to overcome the challenge of the activity. Actions and awareness of the action should merge so that the person is doing the activity spontaneously rather than deliberately thinking about it. A person should possess clear goals about the activity, should receive unambiguous feedback about how s/he is performing, and should maintain complete concentration on the activity. Moreover, the person should experience a sense of control over the activity without being too aware of putting control, and should lose awareness of time. Finally, the person should feel being autotelic meaning that the action itself should be rewarding (Csikszentmihalyi, 1990).

### **Flow and Creativity**

Flow has been found to improve performance especially in sports (Jackson, Thomas, Marsh, & Smethurst, 2001) and has also found to be related to enhanced creative performance in the musical domain (McDonald et al., 2006). Potential reasons for the positive relation between flow and performance might be twofold: (1) flow might be increasing cognitive clarity through boosting attentional focus; or (2) flow might be indirectly increasing (intrinsic) motivation to grow skills on a long-term basis (Landhäußer & Keller, 2012). But the mechanisms behind the flow-performance relationship and how they are connected to creativity is still not clear. Cseh, Philipp and Pearson (2014) argued that a combination of high flow and high positive affect is the key to creative performance. In their study, they required people to perform “the

creative mental synthesis task” in which participants had to mentally combine sets of simple alpha numeric and geometric shapes into composite patterns. Participants first described their mental image in writing and then drew a picture underneath. This task was chosen to simulate the creative process because its simplicity requires no artistic background or training, yet it is challenging enough to potentially inspire flow.

Moreover, during the synthesis task, participants often report task enjoyment and being pleasantly surprised by their own abilities (Finke, Ward, & Smith, 1992, cited in Cseh et al., 2014), suggesting flow or positive affect may be induced. Two objective measures of creative performance were calculated to assess the drawings of participants:

Productivity and transformational complexity. Moreover, external judges also rated products on two subjective measures: correspondence to description and general creativity. After the synthesis task, participants rated their flow experience and also their own perceived creativity in the task. Flow was highly correlated with self-rated creativity and productivity, but it was not significantly related to any of the externally rated measures of creative performance. Self-rated creativity was significantly related to productivity but unrelated to any of the other external performance ratings. Pre- and post-task positive affect and both positive-affect and negative-affect-change were related to self-rated creativity. There were no other significant relationships between any of the other external creativity measures and pre-task, post- task, or affect change across the task. Moreover, the relation between flow and self-evaluation of creativity was interpreted as a support for the vital component of flow, challenge-skill balance, in which a person needs to perceive his/her own skills as sufficient to meet challenges. These results indicate that positive affect and flow are associated with different aspects of creativity, which show that they are measuring distinct constructs. These findings are informative but there is a need for more extensive research to understand the relation between flow and creativity.

## Chapter 2 – Social Flow

A study conducted by McDonald et al. (2006) is one of the very few experimental investigations on creativity and flow. It assessed the relationship between flow, creativity and output quality. University students worked in groups of three on a group composition task during three meetings. The task was designed in such a way that it met the four conditions of flow: participants were given clear goals in every step, there was immediate feedback, a balance between challenge and skill, and fear of failure was controlled. After each meeting, students completed a questionnaire about their recent experience, the experience sampling form (McDonald et al., 2006). Their compositions were recorded and rated for quality and creativity by the students themselves and by music specialists. All groups rated the composition with the consensual assessment technique (Amabile, 1996) which asked them to rate the degree to which each composition was creative using their own definition of creativity. McDonald et al. (2006) found that increased level of flow was related to increased level of creativity rated by music specialists. However they could not find a link between student-rated creativity and flow.

Flow was used as an assessment tool in a study conducted by Byrne et al. (2003). They investigated whether optimal experience of creativity occurs if three conditions of flow were present during completion of a composing task and if flow experience was positively related to the quality of the composition. The flow conditions investigated were having clear goals (participants were given choices for the tasks), receiving immediate feedback, and experiencing balance between challenge and skill. Students were required to compose a musical piece for the instruments they selected. They worked in groups with a maximum of three people and met at least three times to create the compositions. After the group process, students and two groups of experts rated the compositions. While students only rated their piece with the consensual assessment technique, experts additionally rated the compositions according to standard

criteria used for music degrees in the department. The quality of the compositions and flow experience correlated highly and positively, suggesting that students who produced high-quality creative work enjoyed the experience.

In sum, previous research demonstrates a positive link between flow and creativity. That link confirms the applicability of flow as a tool to understand the creative process. Understanding of how flow is experienced in a collaborative context could therefore be a window into the processes occurring during group creativity. The current research will focus on how flow is experienced in social settings, particularly large collaborative creativity contexts, to gain a preliminary understanding about processes involved in group creativity.

### **Social Flow**

Traditionally, flow is assessed at the individual level as an optimal and momentary experience that occurs during a specific activity while individuals are totally engaged. More recently, flow has been also shown to happen in a group context as a shared positive experience (e.g., Salanova, Sanchez, Schaufeli & Cifre, 2014).

Although social flow shares the same basic conditions with individual flow (e.g., the balance of challenge and skills), it is not equivalent to individual flow (Walker, 2010). Individual flow is more likely in situations where individual performance is decisive even though individuals have to work together. However, if group collaboration is decisive in performance, then social flow is more likely to occur (Walker, 2010).

Sawyer (2003) aimed to investigate the concept of social flow to understand optimal creative group performance. He defined “group flow” as “a collective state of mind (...) a peak experience, group performing at its top level of ability” (p. 43) which “cannot be reduced to psychological studies of the mental states or the subjective experiences of the individual members of the group” (p. 46). In that sense, group flow could be seen as a key process in group creativity because it does not reduce the group

## Chapter 2 – Social Flow

creative process to an individual state but requires approaching the process through group interactions. Sawyer (2003) identified several conditions which facilitate the occurrence of group flow. These include the definition of a common goal, the development of close listening skills, complete concentration on the group activity, being in control of the process which is facilitated by group members' sense of autonomy, the capacity of "blending the egos", which is achieved when the barriers between individual and collective intention disappear, an equal participation environment where everybody can raise their voices comfortably, a sense of familiarity in terms of other team member's performance, a constant and informal communication between members about the process, the ability to build on each other's ideas to move forward, and a group atmosphere where there is room to fail.

Based on these definitions, group flow requires members to reach a state of mutual trust and empathy (Gaggioli et al, 2013). Accordingly, it is not only important to consider the flow experience when investigating the creative group process but also to examine psychological variables that might contribute to group flow. Only very limited research exists on the conditions that facilitate group/social flow (Salanova et al., 2014). The current research aims to fill that gap by exploring two facilitators of social flow in large collaborative contexts of different art domains, namely motivation and empathy.

### **Motivation and social flow**

According to many psychologists, intrinsic motivation is an important enabler of creativity (Grant & Berry, 2011). Intrinsic motivation is defined as the desire to expend effort based on interest in and enjoyment of the work at hand (Amabile, 1996). However, there are mixed results regarding the relation between intrinsic motivation and creativity. While some experimental studies showed that creativity increases with induced level of intrinsic motivation (Amabile, 1979; Cooper & Jayatilaka, 2006; Hennessey & Amabile, 1998), some showed little or no effect of motivation (Dewett,

2007; Eisenberger & Aselage, 2009; Perry-Smith, 2006). Likewise, motivation has been proposed to be associated with the flow experience (Jackson, 1995). When Csikszentmihalyi (1996) described the autotelic state of flow as: “The state in which people are so intensely involved in the activity that nothing else seems to matter: the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it.” (p.4), he clearly drew a link between flow and intrinsic motivation. Despite the strong link Csikszentmihalyi formed, motivation’s role in flow is a topic of debate. Particularly, there is no consensus on whether intrinsic motivation is a consequence, antecedent or a fundamental component of flow and existing correlational research is not enough to resolve the conflict (Landhäuser & Keller, 2012). For instance, Martin and Cutler (2002) found a positive relation between flow and motivation, particularly intrinsic motivation, in theater actors. Kowal and Fortier (1999) explored the relation between motivation and flow in swimmers and observed that more intrinsic forms of motivation positively influence flow experience. On the other hand, there are also studies with contrasting findings (e.g., Stein, Kimieck, Daniels & Jackson, 1995). For instance, Mannell, Zuzanek, and Larson (1988) found that rather than intrinsically motivated individuals, the ones who were extrinsically motivated and who were free to make their own choices about the activities they are engaged in reported the highest levels of flow.

These mixed findings regarding the relationship between motivation and flow can perhaps be resolved by using a more extensive model of motivation (e.g., Martin & Cutler, 2002). Deci and Ryan’s (1985) “Self-Determination Theory” goes beyond the traditional intrinsic/extrinsic motivation distinction and proposes a more elaborate model of motivation. According to this theory, humans strive for the fulfilment of three basic psychological needs: competence, relatedness, and autonomy. The more humans satisfy these basic needs, the more they are internalizing their actions and the more their

motivations become self-determined. Self-determination is represented as a continuum with one end representing the most self-determined types of motivation, intrinsic motivation, where the person acts on certain behaviour only for the sake of sheer joy of it. On the other end of the continuum is amotivation, the least self-determined type of motivation state where the individual lacks any kind of intention to act (Deci & Ryan, 2002). Different types of extrinsic motivation can vary in self-determination as well. From the least self-determined to the most self-determined these are: external, introjected, identified, and integrated motivations. In external motivation, externally controlled rewards or punishments direct behaviour. In introjected motivation, the need to feel worthy and/or to avoid guilt and shame is the primary driver of behaviour. Identified motivation results from the personal importance attributed to the actions. The final and the most autonomous form of extrinsic motivation is integrated regulation, which occurs in situations where the individual pursues an act if it is congruent with life goals, and needs (Deci & Ryan, 2002). The current study will investigate the relation between group flow and motivation in light of Self-Determination Theory. On the basis of research pointing to the importance of intrinsic motivation in flow experience, intrinsic motivation and more self-determined types of extrinsic motivation, like integrated and identified regulation, are expected to be related to higher levels of flow experience in a group context. Conversely, less self-determined types of motivation, like introjected regulation, extrinsic motivation and amotivation, are expected to have less strong or no association with the group flow experience.

Another way to interpret the mixed findings regarding intrinsic motivation and flow would be to take into account the role of domain-specificity. Baer (2012) argues that both creativity and the relation between intrinsic motivation and creativity are domain-specific:

Even if we assume that the theory linking intrinsic motivation to creativity is correct, the implication that intrinsic motivation would then be a domain-general factor is misleading because intrinsic motivation is actually very domain-specific. One cannot simply take one's motivation to write poetry and apply it somewhere else...Doing something in any domain requires motivation of some sort, but intrinsic motivation is not fungible. It is very domain specific.” (p.18)

The importance of considering domain-specificity in motivation has been appreciated in empirical research as well. Martin (2008) investigated four motivational variables, namely adaptive cognitions, adaptive behaviours, maladaptive cognitions, and maladaptive behaviours in sport, music, and school settings. Students in sport schools had higher adaptive cognitions and adaptive behaviours in sports settings rather than school or music settings. He also found higher within-domain correlations than between-domain correlations between the four motivational variables. The present research will thus investigate the relation between group flow and motivation in large groups from different art domains to explore whether that relation could be generalized to different domains of creative performance.

### **Empathy and social flow**

One of the important differences between individual and group performances is the social interaction between members. These interactions are paving the way for a collective state of mind, which in turn is expected to influence peak performances (Waddington, 2013). However, how this collective state of mind formed is unknown. Sawyer (2003) suggested that the achievement of group flow requires group members to listen each other, to build on each other's ideas and eventually to blend their egos. In other words, Sawyer acknowledged that awareness of contribution of other group members and interpersonal understanding are required for a group to reach collective flow state. Likewise, Walker (2010) proposed that a highly interdependent situation

## Chapter 2 – Social Flow

where performance relies on collective effort, such as team sports or music bands, facilitates collective flow state. Hart and Di Blasi (2015) compared group flow with individual flow experiences and stressed the necessity of interpersonal understanding in group flow. They observed and interviewed six adults with a minimum of 8 years of experience in a music band. Participants identified five major components of group flow. One of the themes appeared was called “high and lows”, which was attributed to the development of empathic feelings between group members. Group members develop the ability to feel not only the high points but also the low points of the experience and, for instance, they even start sharing the blame for mistakes that other members made. Hart and Di Blasi (2015) concluded that especially this “high and lows” stage marks a difference between individual and group flow experience. Thus, interpersonal understanding in the group setting might be a primary characteristic of group flow, and empathic connections between group members would be vital for social flow experiences.

Empathy is a multidimensional constructs that spans the cognitive ability of understanding another’s emotional state as well as the affective ability of sharing others’ emotions (Davis, 1983; Eisenberg & Fabes, 1990). According to Jackson, Meltzoff and Decety (2005), although there are various conceptualizations of empathy, two dimensions are consistently mentioned in various definitions of empathy: “(1) an affective response to another person, which often, but not always, entails sharing that person’s emotional state, and (2) a cognitive capacity to take the perspective of the other person while keeping self and other differentiated” (p. 771).

Myers and White (2011) conducted a qualitative study about the role of empathy in musical performance and asked professional musicians to reflect on their personal relationships with other musicians especially in terms of empathic connections. They found that empathic connections between musicians were deemed highly important for

playing well together. Similarly, in her research with a music ensemble Waddington (2013) found that co-performer empathy was one of the predictors of optimal peak performance. Consequently, I propose empathy to be a key variable for the formation of group flow. Specifically, I expected that individuals higher in empathy are more likely to experience higher group flow.

### **Domain and social flow**

The issue of domain specificity versus domain generality has been a topic of debate in creativity research. Studies which focus on creativity from the “product” perspective (i.e., evaluating creative outcome) have generally regarded creativity as a domain specific trait. In other words, a person’s creativity in one domain cannot be generalized to other domains (Baer, 2010; Sullivan & Ford, 2010). It is not a good practice to judge creativity in one domain against creativity in another domain as what makes a product creative is different in each domain (Baer, 2010). Yet, research focusing on creativity from the “person” perspective (i.e., evaluating the creative person) defends domain generality in creativity (Silvia et al., 2009). Other perspectives try to find a mid-way between domain specificity and generality. For instance, Plucker and Beghetto (2004) proposed that creativity can be both domain specific and domain general; its level of specificity might change with social context and with development from childhood to adulthood. In this research I adopted the domain specificity approach (Baer, 2010) and expected that the domain of creativity/performance should play a significant role in the flow experience. Therefore, group flow and its relationship with motivation and empathy were investigated in three different art domains, namely dance, musical theatre, and orchestra.

### **Research Aims**

In light of previous research showing a link between creativity and flow, this study focused on the flow experience and used it as a tool to understand processes

## Chapter 2 – Social Flow

underlying collaborative creative processes. The overall aim of the study was to understand how flow is experienced in a social context, particularly in a large collaborative art context. Specifically, I explored inter-relations between flow experience, motivation and empathy in collaborations of three different art domains, namely orchestra, dance and musical theatre (Research Aim 1). I conducted the research at three different times of the year to examine potential differences in the experience of group flow (Research Aim 2). Moreover, I also aimed to understand if there are any differences in experience of flow (Research Aim 2) and motivation in different art domains (Research Aim 3). Furthermore, I explored inter-relations between flow state, motivation and empathy by considering the potential effect of the creative domain (Research Aim 4).

### Method

#### **Participants**

This study involved 240 participants from three different cohorts (Cohort 1, n= 85; Cohort 2, n = 80; Cohort 3, n = 75). In all three cohorts participants included performers from three different art domains (orchestra, n = 86; dance, n = 51; musical theatre, n = 103) from both genders (male = 64, female = 176). Participants ranged in age from 20 to 68 years, however the majority of them were young adults ( $M_{Age} = 25.70$  years;  $SD = 9.68$  years). All participants were volunteers and they were recruited from Plymouth University. Dancers were recruited from a dance module, actors were recruited from the Musical Theatre Society and orchestra members were recruited from the Orchestral Society. Most of the participants had A-levels (75 %), some of them had undergraduate degree (16.7 %) and a few had postgraduate degree (5.4 %). Length of their experience in their current groups ranged between 0 – 28 years. While most of the participants indicated less than one year experience (58%), quite a number of them

reported to have one year (14.2%) and two years (12.9%) of experience in the respective group.

### **Procedure**

The study received ethical approval from the university's Behavioural Ethics Committee. I visited three different cohorts of participants during their rehearsals. I briefed them about the study and assured them about the confidentiality of their responses as well as right to withdraw. Participants, who volunteered to take part, signed the consent forms. Since their motivation is expected to contribute to their flow experience, participants were given a demographics questionnaire and the Sports Motivation Scale (SMS-II) before their performances began. Performances in each domain lasted approximately 45-60 min. Then, right after their performances, participants completed the Empathy Quotient scale (the EQ) and the Flow State Scale (FSS-2). In the end, participants were debriefed and thanked for their participation.

### **Measures**

**Demographics.** Participants were required to fill out information regarding their date of birth, gender, highest educational achievement level, and how long they had taken part in the current artistic group.

**Sport Motivation Scale – Revised (SMS-II).** The SMS-II (Pelletier et al., 2013) is an 18 item, 7-point Likert-type scale with responses ranging from 1 = “does not correspond at all” to 7 = “corresponds exactly”. It is composed of six subscales that represent six types of motivation which are intrinsic, integrated, identified, introjected, external, and amotivation, identified by Deci and Ryan (1985). Some of the items in SMS-II were modified to reflect the corresponding activities of each domain. For instance; the word “sports” in the item “Because practicing my sport reflects the essence of who I am” was changed to “music”, “dance, or “theatre” according to sample being studied. Six different scores were calculated for each subscale, by summing up the

scores for the three items in each subscale. Subscales as well as the global motivation score had very good reliability levels (see Table 2.1)

**Flow State Scale-2 (FSS-2).** The revised version of the flow state scale (FSS-2, Jackson & Eklund, 2002) measured intensity of flow as a state and asked participants to answer questions thinking of the specific activity they had just completed. This measure contains 4 items for each of the nine dimensions of flow experience. Using a 5-point-Likert-type scale, ranging from 1 (“strongly disagree”) to 5 (“strongly agree”), participants were asked to rate how often they experienced various aspects of the flow experience in their performance, such as challenge-skill balance (“I was challenged, but I believe my skills would allow me to meet the challenge”), action-awareness merging (“I made the correct movements without thinking about trying to do so”), and clear goals (“I knew clearly what I wanted to do”). The scale was revised by replacing items targeting individual experiences with group experiences. For each group of performers wording was revised according to their field. For instance, the word “sport” was replaced with “orchestra”, “theatre” or “dance”. Reliability scores that were calculated for nine dimensions as well as for a global flow score were all high (see Table 2.1)

**The Empathy Quotient (EQ).** The EQ (Baron-Cohen & Wheelwright, 2004) is a 60-item questionnaire, one of the most widely used self-report measures of empathy in adults. Forty items tap participants’ empathy and 20 items are filler items that were included to distract the participant from the fatigue that might be caused by empathy items. In the present study, only 22 items were included, and the items measuring Sympathy (a special subset of empathy) were removed. Responses can range from “strongly disagree” to “strongly agree”. A participant scored two points if s/he selected strongly empathizing responses and one point if she/he selected slightly empathizing

Table 2.1  
*Internal Reliability (Cronbach’s alpha coefficient) for SMS-II and FSS-2 subscales*

Subscale	Alpha
Intrinsic motivation	.88
Integrated regulation	.80
Identified regulation	.87
Introjected regulation	.70
External motivation	.82
Amotivation	.85
<b>Global Motivation</b>	.86
Challenge skill	.83
Action awareness	.84
Clear goals	.82
Unambiguous feedback	.80
Concentration on task	.83
Sense of control	.86
Loss of consciousness	.76
Transformation of time	.78
Autotelic experience	.84
<b>Global Flow</b>	.92

responses (i.e., each item being scored 2, 1, 0, 0). A total score of empathy was calculated by simply summing up the scores of each item. The scale includes items such as “I can easily tell if someone else wants to enter a conversation”, “It is hard for me to see why some things upset people so much” and “I am good at predicting what someone will do.” The scale displayed high reliability,  $\alpha = .87$ .

## Results

### **Correlations between variables**

Pearson product-moment correlations were computed to examine the relationships between flow experience, motivation and empathy. Table 1.2 indicates that there were significant correlations between flow experience, motivation and empathy. The flow subscales revealed stronger significant correlations with intrinsic motivation, integrated regulation and identified regulation. The number of significant correlations and the size of correlations between flow subscales and motivation decreased gradually for introjected regulation, external motivation, and amotivation. As expected, the flow subscales, except for the transformation of time subscale, were all negatively correlated with amotivation. Moreover, most of the flow subscales were correlated with empathy, except for the concentration on task and transformation of time subscales. While integrated and identified subscales of motivation were correlated with empathy, the correlation between empathy and intrinsic motivation was not significant. Also, empathy did not correlate with global motivation. Finally, all flow subscales and the global flow score were correlated with the global motivation score, except concentration on task. In sum, the flow subscales were generally correlated with each other. Second, there were significant correlations between flow and the more self-determined types of motivation. Third, empathy was correlated both with most of the flow subscales and two more self-determined motivation types, namely integrated and identified regulation. These results show that flow, empathy and certain types of motivation might be inter-related and this will be investigated with further analyses (see Table 1.2). Moreover, the high inter-correlations between the motivation subscales as well as between the flow subscales point indicate that the subscales could be explained with more parsimonious factorial models.

### **Factor Analyses of Flow State Scale**

The Flow State Scale assesses the extent to which individuals experience a flow state with 36 items which fall under nine subscales. However, the correlations between the flow dimensions (see Table 2.2) indicate that the scale could be explained in a more parsimonious way. Thus, I first tested the fit of two alternative models: a single factor model and a hierarchical model with one higher order factor of flow with confirmatory factor analyses (see Csikzentmihalyi, 1990; Jackson & Ecklund, 2002; Jackson & Marsh, 1996; for theoretical justifications). Both absolute and incremental fit indices were used to evaluate the adequacy of the models. Absolute indices assess the extent of fit between covariances of the model and observed covariances. Chi-square ( $\chi^2$ ) is one of the absolute indices recommended for the nested models (Hoyle & Panter, 1995, cited in Vlachopoulos, Karageorghis & Terry, 2002). Chi square/ degrees of freedom values of less than 2 indicate desirable and up to 5 indicate acceptable value (Hu & Bentler, 1999). Incremental indices assess the degree to which the defined model is better than a model with no covariances. The following incremental indices were used: the Standardized Root Mean Squared Residual (SRMR), the Root Mean Squared Error of Approximation (RMSEA), the Comparative Fit Index (CFI), the Non-Normed Fit Index (NNFI) and the Tucker Lewis Index (TLI) (see Vlachopoulos et al., 2000). Values that are .08 or below for RMSEA (Browne & Cudek, 1993) and SRMR (Hu & Bentler, 1999) and values that are .90 or greater for CFI, NNFI and TLI are considered a good fit (Hu & Bentler, 1999).

In the single factor model, all of the flow state items were specified to load on one first-order factor. In other words, I tested whether correlations between items were explained by one construct. The model did not show adequate fit to the data, as all of

Chapter 2 – Social Flow

Table 2.2  
*Correlations Among Flow Subscales, Motivation Subscales, Empathy, Global Flow and Global Motivation (N=240)*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1. Challenge-skill	1	.71**	.46**	.49**	.29**	.55**	.40**	.22**	.49**	.26**	.36**	.34**	.17*	.14*	-.17*	.33**	.77**	.28**	
2.Action awareness			.36**	.40**	.21**	.50**	.48**	.19**	.31**	.17**	.30**	.29**	.21**	.08	-.08	.21**	.71**	.25**	
3. Clear goals				.62**	.45**	.63**	.29**	.17*	.42**	.27**	.22**	.20**	.14*	.06	-.05	.25**	.72**	.21**	
4. Unambiguous feedback					.34**	.51**	.30**	.11	.33**	.20**	.26**	.19**	.18**	.07	-.11	.20**	.67**	.21**	
5.Concentration on task						.48**	.26**	.20**	.44**	.21**	.20**	.23**	.01	-.05	-.11	.12	.61**	.12	
6.Sense of control							.40**	.10	.32**	.22**	.22**	.23**	.17**	.05	-.11	.23**	.75**	.21**	
7.Loss self-consciousness								.21**	.27**	.15*	.29**	.17**	.11	.03	-.12	.18**	.64**	.17*	
8.Transformation of time									.41**	.21**	.35**	.24**	.20**	.21**	.17**	.10	.45**	.36**	
9.Autotelic experience										.34**	.27**	.24**	.21**	.07	-.06	.17*	.65*	.27*	
10.Intrinsic motivation											.57*	.54**	.36**	.21**	-.08	.06	.34**	.67**	
11.Integrated regulation												.68**	.48**	.16*	-.13*	.19*	.42**	.71**	
12.Identified regulation													.46**	.25**	-.04	.18**	.36**	.74**	
13.Introjected regulation														.40**	.12	.06	.24**	.74**	
14.External motivation															.37**	.00	.11	.65**	
15.Amotivation																-.10	-.11	.34**	
16.Empathy																	.30**	.10	
17.Global Flow																		.35**	
18.Global Motivation																			1

Note. \*,  $p < .05$ ; \*\*,  $p < .01$ .

the indices, except chi square/df ratio, were under the desirable cut off values [ $\chi^2 = 2573.315$ ,  $df = 560$ ,  $p = .000$  ( $\chi^2/df = 4.60$ ), NNFI= 0.50, CFI=.53, TLI= .50, RMSEA=.12, SRMR= .12).

Next, I tested the hierarchical model in which a higher order factor would explain the intercorrelations between nine first order factors (the nine flow dimensions). In this model, nine first order factors are nested under one higher order factor, which means that variance in these factors can be explained by one higher order factor. The model showed an almost acceptable fit to the data [ $\chi^2 = 1202$ ,  $df = 551$  ( $\chi^2/df = 2.18$ ),  $p = .000$ , CFI=.90, NNFI= 0.80, TLI= .84, RMSEA= .07, SRMR= .09], since some indices (i.e., SRMR, NNFI, TLI) were just below the recommendable cut off values. Examination of loadings of first order factors (flow dimensions) into higher order factor (global flow) showed that all the dimensions had acceptable loadings except the “transformation of time”. A problem with the transformation of time scale has been repeatedly observed in previous research as well (Jackson & Marsh, 1996; Jackson & Eklund, 2002; Vlachopoulos et al., 2000). Thus, transformation of time may not be a salient dimension for flow experience of participants in the current research; therefore, this dimension was removed in the next analyses. Then, I tested the same hierarchical model without the transformation of time dimension. This model with eight dimensions displayed a slightly better fit compared to the previous hierarchical model with nine dimensions and indices reached the acceptable threshold points [ $\chi^2 = 961$ ,  $df = 426$  ( $\chi^2/df = 2.25$ ),  $p = .000$ , CFI=.90, NNFI= .90, TLI= .90, RMSEA= .07, SRMR= .08]. The significant chi-square difference between the two models also proved the improvement ( $\chi^2 = 241$   $df = 125$ ,  $p = .000$ ). Therefore, the hierarchical model with eight first order factors of flow was accepted as the most appropriate solution and scores obtained in these eight flow subscales were averaged into one composite total flow score.

### **Factor Analyses with Sports Motivation Scale - II**

The SMS-II scale is composed of six subscales that represent six types of motivation; intrinsic, integrated, identified, introjected, external and amotivation. It is a common practice to use the scale with six different factors to represent each motivation type (Pelletier et al., 2013). However, since I did not have a specific hypothesis for motivation types with regards to proposed relation with flow state or empathy, I aimed to explain the variance in the scale with a more parsimonious factor solution. For this purpose, a principal component analysis was conducted. Six motivational dimensions of SMS-II scale were factor analysed using principal component analysis with Direct Oblimin (oblique) rotation. Before proceeding with analysis, indicator for suitability to factor analysis was checked. The Kaiser-Meyer-Olkin measure of sampling adequacy was .74, above the commonly recommended value of .6, and Bartlett's test of sphericity was significant ( $\chi^2(15) = 423.227, p = .000$ ). Therefore the scale was suitable for factor analysis.

The analysis yielded two factors capable of explaining a total of 68.30 % of the variance. The sharp drop of eigenvalues on the scree plot after the second factor also confirmed the two-factor solution. The results of the orthogonal rotation of the solution are shown in Table 2.3. Intrinsic motivation, integrated regulation, identified regulation and introjected regulation all loaded into first factor and this factor was subsequently labelled "internal motivation". External motivation and amotivation loaded onto the second factor which was labelled as "external motivation". The factor structure is in line with the proposed continuum of Self-Determination Theory (Deci & Ryan, 1985). Intrinsic motivation, integrated and identified regulation are motivation types that are more self-determined, whereas amotivation, external motivation and introjected regulation are externally determined motivation types. Introjected regulation loads more into factor 1 and this does not completely fit the theoretical expectations (see Table 2.3).

However, it also loads onto second factor with a considerable value (.35). Therefore, considering both statistical indicators and theoretical expectations, introjected regulation was included into the external motivation factor. Two motivation scores (internal, external) were included in the next analyses.

Table 2.3

*Factor Analysis with two factor solution for Sports Motivation Scale (N = 240)*

	Internal Motivation	External motivation	Communality
Intrinsic Motivation	<b>.89</b>	-.15	.59
Integrated Regulation	<b>.85</b>	-.02	.78
Identified Regulation	<b>.77</b>	-.02	.72
Introjected Regulation	<b>.63</b>	<b>.35</b>	.58
External Regulation	-.21	<b>.85</b>	.70
Amotivation	.23	<b>.77</b>	.72
Eigenvalues	45.13	23.17	

*Note. Factor loadings and communalities based on a principal components analysis with oblimin rotation*

### **The effect of domain and cohort on flow**

In the next step, the effect of cohort and domain on the flow scores was investigated. A 2x2 ANOVA with domain (orchestra, dance, musical theatre) and cohort (cohort 1, 2 and 3) as independent variables and flow state total score as dependent variable yielded a non-significant effect of domain,  $F(2, 231) = .30, p = .74, \eta^2 = .00$ , as well as a non-significant effect of cohort  $F(2, 231) = .51, p = .60, \eta^2 = .00$  (see Figure 2.1). In the regression analyses reported below, it was investigated whether domain moderated the relationship between empathy and flow.

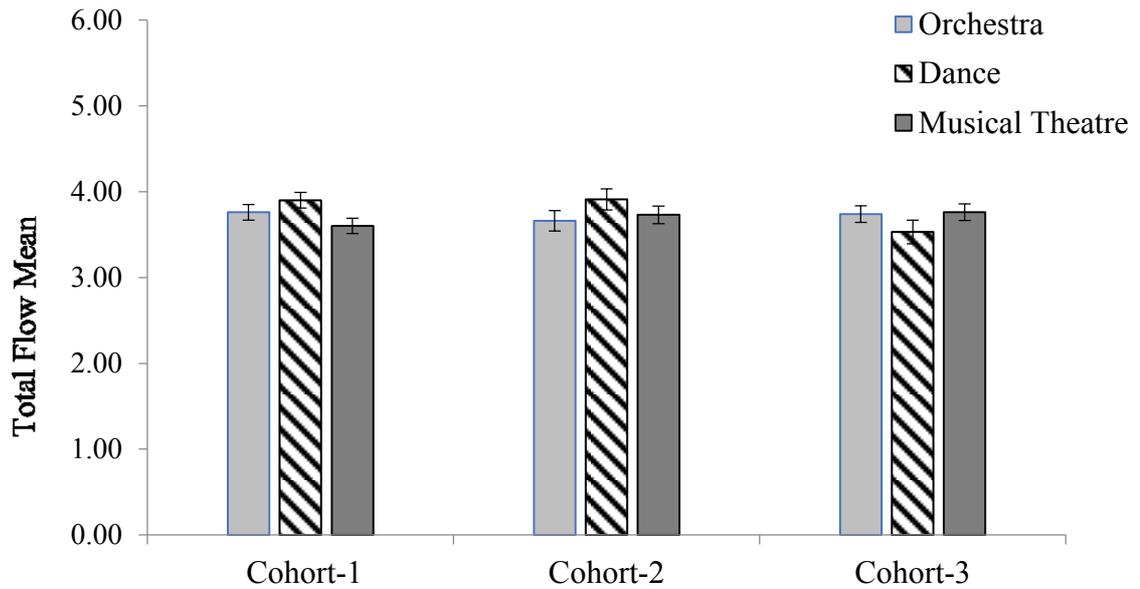


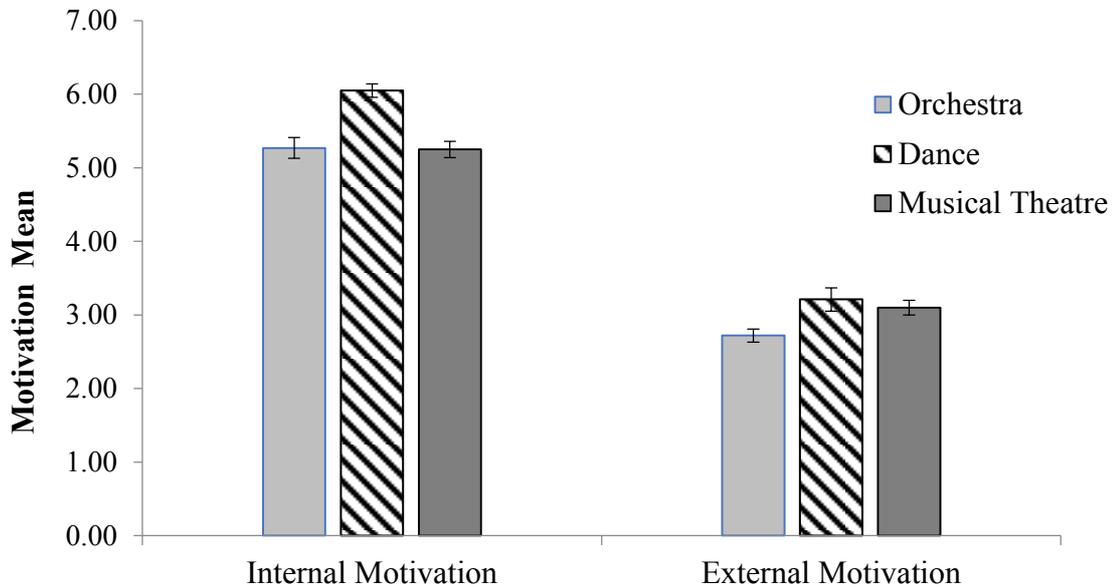
Figure 2.1 Total flow means according to domain and cohort. Errors bars represent standard errors.

### The effect of domain on motivation

In order to understand if motivation in large collaboration contexts differed according to domain and cohort, I conducted a Multivariate Analysis of Variance (MANOVA). Internal and external motivations were dependent variables, whereas domain (orchestra, dance, musical theatre) and cohort (cohort 1, 2 and 3) were independent variables. A statistically significant MANOVA effect was obtained for the effect of domain, Pillai's Trace = .13,  $F(4, 462) = 7.97, p < .000, \eta^2 = .10$ . However, the effect of cohort on motivational variables was not significant, Pillai's Trace = .03,  $F(4, 462) = 1.75, p = .14, \eta^2 = .02$ .

Next, a series of post-hoc Bonferroni comparisons was performed to further explore domain differences in the motivation variables. As shown in Figure 2.2, for internal motivation, dancers reported significantly higher means compared to orchestra members ( $p = .00$ ). Dancers also reported significantly higher means compared to musical theatre members ( $p = .00$ ). The difference between orchestra and musical theatre was not significant ( $p = 1.00$ ). For external motivation, orchestra members

reported significantly less external motivation compared to dancers ( $p = .01$ ). Orchestra members also reported significantly less external motivation compared to musical theater members ( $p = .03$ ). Musical theatre and dance external motivation means did not differ significantly ( $p = 1.00$ ).



*Figure 2.2.* Internal and external motivation means according domains. Errors bars represent standard errors.

### Regression analyses

In the next step, a hierarchical multiple regression analysis was conducted to investigate whether domain, motivation, and empathy predicted the flow experience after controlling for the effects of cohort. Preliminary analyses were conducted to ensure there was no violation of the assumptions of normality, linearity, and homoscedasticity. Moreover, the correlations amongst the continuous predictor variables (motivation variables and empathy) (see Table 2.2) were weak to moderate, which indicates that multicollinearity was not likely to be a problem (Tabachnick & Fidell, 2007). Cohort 3 was chosen as the reference variable, dummy variables of cohort 1 and cohort 2 were entered in the first step in order to control for their effects. For domain, orchestra was chosen as the reference domain, and dummy variables were

created for dance and musical theatre which were entered in the second step to see whether there were any domain based differences. Internal motivation, external motivation, and empathy were also entered in Step 2. In Step 3, the interaction between empathy and dance dummy as well as empathy and musical theatre dummy were entered. Variables were entered in this order as it seemed most plausible for the hypotheses of the study. Higher levels of internal motivation and empathy were expected to predict a stronger flow experience. The other aim was to see if the relation between flow and empathy would differ according to domain. Findings of the two regression analyses are reported in Table 2.4.

The hierarchical multiple regression revealed that at Step 1, the contribution of cohort variables were not significant,  $F(2, 237) = .14, p = .87$  and accounted only 1 % of the variance in flow experience. Dummy coded dance and musical theatre variables, empathy and motivation variables were added at Step 2; the total variance explained by the model as a whole was 23 % ( $F(7, 232) = 9.70; p < .001$ ). Controlling for the effect of cohort, domain variables were not found to be significant predictors. However empathy and internal motivation were significant positive predictors of flow experience. External motivation was not a significant predictor. Introduction of these variables explained additional 22% of the variance in flow and this change in  $R^2$  was significant,  $F(5, 232) = 13.51, p = .000$ . At Step 3, the interaction term between empathy and dance domain and the interaction between musical theatre and empathy accounted for an additional 2% of the variance in flow and they were both significant. Both the overall Step 3 model,  $F(9, 230) = 8.68, p < .000$ , as well as the change in  $R^2$ ,  $F(2, 230) = 4.16, p = .02$ , were significant (see Table 2.4).

Table 2.4

*Summary of Hierarchical Regression Analysis Predicting Flow from Cohort, Domain, Motivation, Empathy and Interaction Terms*

	Step 1			Step 2			Step 3		
	<i>B</i>	<i>SE B</i>	<i>B</i>	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
Cohort									
Cohort 1 vs. others	.00	.09	.00	.05	.08	.05	.03	.08	.03
Cohort 2 vs. others	.04	.09	.04	.03	.08	.03	.02	.08	.02
Domain									
Dance vs. others				-.09	.09	-.07	-.02	.09	-.01
Musical theatre vs. others				-.05	.07	-.05	-.02	.07	-.02
Internal Motivation				.20	.03	.39***	.14	.05	.27***
External Motivation				-.02	.03	-.03	-.02	.03	-.04
Empathy				.35	.09	.24***	.26	.10	.17**
Dance * Empathy							.53	.23	.14*
Musical theatre * Empathy							.13	.06	.17*
<i>R</i> <sup>2</sup>	.00			.20			.22		
<i>F</i> for <i>R</i> <sup>2</sup> change	.14			13.5***			4.16*		

*Note.* *B* = Unstandardized coefficient,  $\beta$  = Standardized coefficient. \*  $p < .05$  \*\*  $p < .01$ . \*\*\*  $p < .001$ .

In line with Bedeian and Mossholder (1994) interaction was further investigated with follow-up tests. Simple slop analysis plot showed that positive relation between empathy and performance flow factor was stronger for dancers ( $\beta=.23, p < .001$ ) followed by orchestra members ( $\beta=.15, p < .001$ ) and musical theatre members ( $\beta=.13, p < .05$ ) (see Figure 2.3).

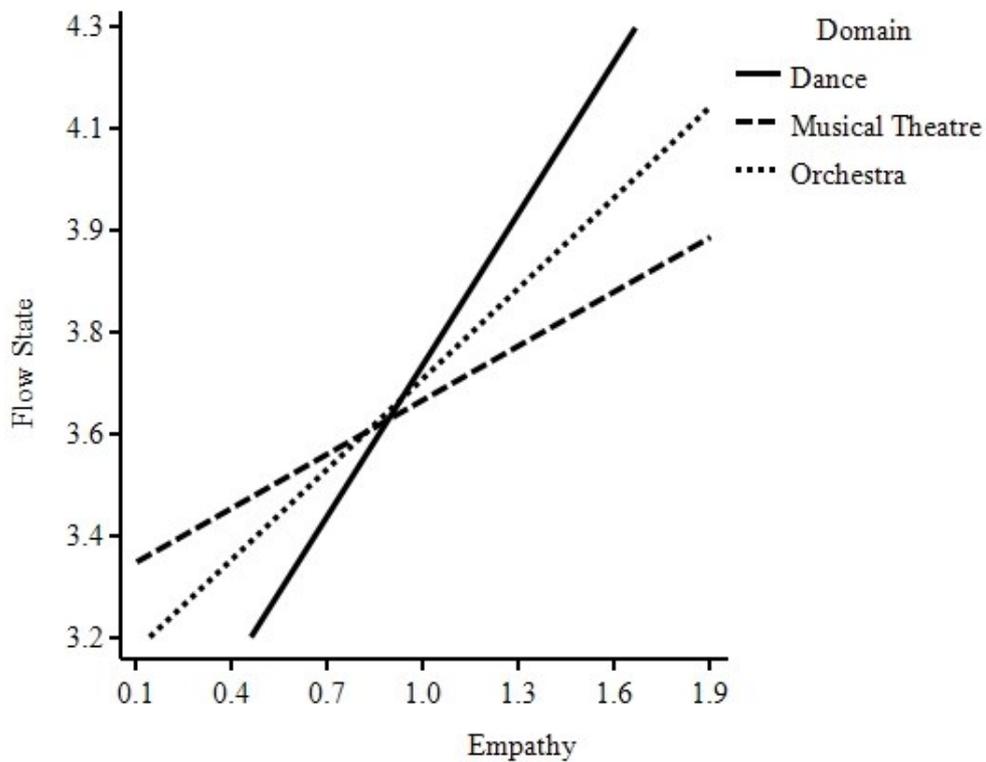


Figure 2.3. Interaction plot of flow and empathy according to domains.

### Discussion

The general aim of the present research was to understand how flow is experienced in a social context, particularly in large collaborative creativity contexts. I focused on the social flow experiences of adults in three different art performance groups, orchestra, dance and musical theatre, and investigated their flow experience during three different times of the year. I first investigated whether there were any differences between different domains and cohorts in terms of their flow experience. The second aim was to understand whether motivation (conceptualized in light of Self-Determination Theory) differed by domain. Third, inter-relations between motivation, empathy and flow were explored to demonstrate contributors of social flow.

#### **Domain and Cohort Differences in Social Flow**

The domain of performance did not make a difference in the level of flow experienced. Earlier research investigated flow experience in variety of domains, such as education (Beard & Hoy, 2010), work (Salanova, Bakker & Llorens, 2006), music (Martin & Jackson, 2008; Sinnamon et al., 2012), theatre (Martin & Cutler, 2002), dance (Hefferon & Ollis, 2006), and athletics (Jackson & Eklund, 2002; Jackson, Martin & Eklund, 2008; Jackson, Thomas, Marsh & Smethurst, 2001; Martin & Jackson, 2008), but there are no previous studies that explicitly compared domain differences in flow. Although the core characteristics of flow were generalized from the results of these earlier studies, some inconsistencies were observed, such as lower correlations of transformation of time and loss of consciousness dimensions in the global flow scores (Jackson et al., 2001; Jackson & Eklund, 2002). This casts doubt as to whether flow is experienced similarly in different domains like music and sports (Sinnamon, Moran & O'Connell, 2012). In the current research, although orchestra, dance and musical theatre represented different domains, in the end they were classified under overarching domain of performing arts. There are characteristics common to

these three performing art domains such as presentation, expressing emotions, a relation with the audience, and production (Sinnamon et al., 2012). This is why the finding that similar levels of flow experience were observed in these domains would not be too surprising.

A second aim of the study was to investigate cohort differences in flow. In his group flow theory Sawyer (2003) suggested that group flow is more likely to occur if group members are more familiar with each other and know each other's style. My findings did not reveal cohort-related differences in flow experience. In other words, observations of flow during different times of the year did not display any evidence that flow was increasing as groups spend more time and gain familiarity. This could be simply due to the fact that participants enjoyed performing together and their level of familiarity did not make a difference in their flow states. It could be also because groups are composed of participants with mixed level of membership duration; some stated they just have joined the particular group, whereas some were performing with their group for longer time (i.e., orchestra members). Future research could explore flow experience of groups by experimentally controlling the familiarity level of group members.

### **Social Flow, Motivation, and Empathy**

Initial correlation analyses revealed many significant associations between flow dimensions, global flow, motivation dimensions, global motivation and empathy. Regarding the relation between motivation and flow all flow dimensions were positively correlated with intrinsic motivation and more self-determined types of extrinsic motivation, such as integrated and identified regulation. However, the number and size of correlations decreased for less self-determined types of motivation like introjected regulation and external motivation. Finally, for amotivation, most of the correlations were negative and non-significant except transformation of time. This finding is not

striking since transformation of time dimension of flow have been criticized on conceptual and statistical grounds and suggested to be a less fundamental aspect of flow state (Jackson & Eklund, 2002). In sum, similar to previous studies (Kowal & Fortier, 1999, Martin & Cutler, 2002, Pelletier et al., 1995), flow was found to be more strongly correlated with intrinsic motivation and more self-determined types of extrinsic motivation and it was mostly unrelated with amotivation. Thus, participants in all domains were mostly motivated to perform that particular art because of internal reasons and to a much lesser degree because of external reasons. However, the significant relations between flow and less self-determined types of motivation showed that participants were still motivated by external reasons to some extent. Participants of the current study experienced flow more when they performed to achieve more personal goals that will result in more self-fulfilling feelings like identification. Similarly, flow was higher when participants thought that performing in that group was congruent with their life goals and needs (i.e., integrated regulation).

Domains were also compared with their scores on two motivation factors labelled as internal and external. Internal motivation factor included intrinsic motivation, integrated and identified regulation, which are more self-determined motivation types. On the other hand, external motivation factor included more externally determined motivation types; introjected regulation, external motivation and amotivation (Deci & Ryan, 1985). Dancers revealed higher internal motivation means compared to both musical theatre and orchestra members, while musical theatre and orchestra did not differ. Moreover, orchestra members displayed lower external motivation means compared to both musical theatre and dance members.

These findings are meaningful when we consider the domain specific nature of creative performances. A study by Ivcevic and Mayer (2009) explored dimensions of everyday, intellectual and artistic creativity with a large number of students. Responses

## Chapter 2 – Social Flow in Performance Arts

on artistic creativity questions were clustered into five distinct dimensions: visual arts, music, dance, theatre and writing. If artistic creativity is domain-specific, then the motivational aspects behind these domains should also differ (Baer, 2012). The current study did indeed show that motivation (defined according to Self-determination Theory) differed between the domains of orchestra, dance, and musical theatre. Dancers revealed more self-deterministic (i.e., internal) motivations compared to other domain performers. Dance can be a demanding field that requires maintenance of both physical and psychological skills, and intrinsic motivation gained through previous flow experiences is a necessary driver for dancers' long-term resilience (Jeong, 2012). That demanding state of dance could be constantly necessitating a balance between challenge and skill, the most fundamental dimension of flow, and could be eventually leading to frequent experiences of flow. Thus, previous optimal flow experiences might cause dancers to seek that experience again and hence internally motivate them (Kimić & Harris, 1996). As Csikszentmihalyi (2000) suggested, flow experienced through dance as well as the success of movements, makes people proud of themselves and provides intrinsic motivation to the dancer. The lower external motivations observed in orchestra members compared to dance and musical theatre could be due to the difference of orchestra's performance structure. Dancers and musical theatre actors perform on the stage in a more physical manner and different than orchestra players; their physical appearances also become a tool during the performance. Thus, in addition to their motivations to perform, the external judgements (i.e., from their instructors, friends, audience) regarding their physical appearances might gain importance. That physical aspect of dance and musical theatre could easily lead to external motivations (i.e.; receiving good feedback for physical appearance) Hence, I speculate that orchestra member's less prominent physical existence on the stage could be lowering their external motivations that dancers and musical theatre actors are more subjected to.

## Chapter 2 – Social Flow in Performance Arts

Further regression analyses conducted with domain, empathy, motivation and flow gave a more detailed picture of the relations between those variables. Results showed that, both internal motivation and empathy were positive predictors of social flow experience. More empathic group members were more likely to reach higher flow states. In other words, as group members displayed higher empathy they experienced higher levels of challenge-skill balance, their actions were more merged with their awareness regarding those actions, they had clearer goals about what they will do next, they felt more like they had enough level of feedback, they felt a deeper sense of control on what they are doing and they were less restricted by their reflective consciousness. These findings are the first to show the relation between flow and empathy with a quantitative approach; however existing qualitative studies support these findings (Hart & Di Blasi, 2015; Myers & White, 2011; Waddington, 2013). Furthermore, some of the preconditions of group flow suggested by Sawyer (2003), such as close listening skills, the capacity of blending the egos and a sense of familiarity, are closely related to empathic skills. If empathy is a key skill for group flow, it might also be an important antecedent of creativity in groups. To build on these findings, the role of perspective taking (the precursor of empathy) in group creativity context will be investigated in the next chapters of this current thesis.

I also found that the relation between empathy and flow was most pronounced for dancers. Thus, it is possible to suggest that dance provides a unique context to experience flow since empathy is much more important to reach to flow state for dancers compared to performers of other domains. There could be several reasons underlying the uniqueness of dance context for empathy and flow association. First, dancers need to focus on multiple things at the same time, such as the music, environment and their movements, and this requires them to be attentive to others' feelings and attitudes (Jeong, 2012). Second, dancers took part in the research after the

end of their improvised session and taking part in improvisation might have been responsible from stronger empathy and flow association. Ribeiro and Fonseca (2011) explain the process of improvised dance:

“Improvisation in dance requires a type of cognition anchored in the body and situated in the relation with the partners and the space. Both the movements of the dancers and the space are re-built and acquire new meanings as from this relation. This relational meeting is affected by the emotions which arise from it. The emotions modulate the perception, the intentions and consequently the actions, affecting the movements in their sensory perceptive essence.” (p.72)

Therefore, dancers share a lot during improvisation including emotions, perceptions, intentions, actions, and movements. These empathic connections, which are also called kinaesthetic empathy, lead to collective actions and joint motor movements (Godard, 1995 cited in Riberio & Fonseca, 2010). According to Sawyer (2003), improvisation is the strongest and purest form of creativity and allows more room for group flow. He also considers listening to others and making joint decisions in the group as preconditions of group flow. Overall, both the nature of dance context and improvisation might have created an empathic ground between dancers which in turn boosted their experience of flow.

Orchestra members displayed stronger empathy and flow association compared to musical theatre members. Although the current research is the first to show empathy's importance for flow experience of orchestra members, the importance of empathic skills in musical context is established in empirical research (see Sevdalis & Keller, 2014, for a review). For instance, Keller (2014) suggested that empathy on anticipating the action of fellow members supports synchronization in ensembles. There is also evidence of importance of interpersonal understanding in brain studies.

Novembre, Ticini, Schutz-Bosbach and Keller (2012) investigated the distinction

between self and other related motor area representations in the brain during a joint musical task with pianists. Pianists who displayed more perspective taking had more motor cortex activity. According to Cross, Laurence and Rabinowitch (2010), music in cooperative contexts can lead to emergence of “empathic creativity” which they define as follows:

Sometimes when playing music together a moment of grace transpires. It is not only that we take intense pleasure in the music, but in addition we feel that the other person is playing with us in a most emotionally intimate way. These empathic moments, when they occur, are characterized by a flowing of musical interactions, which feels as if the players are in complete harmony with each other both musically and emotionally. At the same time, when making music together, we add an additional dimension of creativity to musical process, especially when composing or improvising, as we are the creators or the “designers” of the music being played. We can define the experience of mutual affective alignment underlined by a creative process as “empathic creativity”. (p. 341).

Particular mechanisms of cooperative music settings (e.g., in an orchestra), including imitation (mimicry of a song, rhythm, a scale), entrainment (synchronization of two or more rhythmic processes), disinterested pleasure (pure aesthetic interest in music), flexibility (room for change and surprise), ambiguity (appreciating the ambiguous nature of music), shared intentionality (valuing cooperative work and seeing each group member as indispensable), and intersubjectivity, enables the development of such empathic creativity (Cross, Laurence and Rabinowitch, 2010).

In addition, self-determined types of motivation (internal) were found as another strong predictor of flow state which meant that higher levels of internal motivation predicted higher flow state. Currently, there is a debate in the literature about whether

intrinsic motivation is a consequence, antecedent or perhaps a component of flow (Landhäußer & Keller, 2012); a confusion that started since Csikszentmihalyi (1975) originally labelled the experience as “autotelic experience” rather than flow (Engeser & Schiepe-Tiska, 2012). This debate continues since flow can be experienced in contexts where more extrinsic motivations operate, such as work contexts (Engeser & Schiepe-Tiska, 2012). My findings favour the research associating flow with more intrinsic rather than extrinsic motivations (Kowal & Fortier, 1999; Martin & Cutler, 2002). Concepts of flow and intrinsic motivation are indeed quite related and it is also reflected in the description of flow which refers to autotelic joy of the experience (Landhäußer & Keller, 2012). However, the current findings extend the previous research by showing that not just intrinsic motivation but also more self-determined types of extrinsic motivation (which I labelled internal; e.g., integrated or identified regulation) can facilitate social flow experience in performance arts. As discussed above, although there were no domain differences in flow experience there were motivational differences between domains, which shows that, depending on the context, various motivational aspects could be underlying flow states.

### **Limitations**

Despite the contributions of the present study in understanding social flow experience, it is necessary to interpret the results with caution due to the non-experimental nature of this study. Future studies should try to manipulate intersubjective elements in group contexts to assess their influence on social flow. Another limitation of the study was that it measured flow experience retrospectively through self-report questionnaire. I used the componential approach to conceptualize flow as a state that is characterized by nine components (Jackson & Ecklund, 2002). Although the componential model has the strengths of offering a comprehensive definition of flow and a psychometrically solid measurement tool, it also has some

major weaknesses (see Moneta, 2012 for a detailed discussion). For instance, it does not measure the prevalence of flow and hence assume that all respondents can be categorized into those experiencing low or high flow, while in fact some might never reach this state (Moneta, 2012). Experience sampling methods (ESM; Csikszentmihalyi & Larson, 1987) could be an alternative for measuring social flow as it allows assessing flow “in the moment” and therefore captures its prevalence over a specific period of time. ESM requires participants to send electronic signals whenever they experience flow through a provided apparatus. After each signal, a self-report measurement is filled out by participants and this process is repeated throughout a performance or rehearsal. Another methodological concern of the current study is that the Flow State Scales are primarily designed to capture individual experiences. Although participants in the current research were instructed to refer to social flow experience while responding, the use of instruments specifically designed and validated for social flow would have been better choice. Nevertheless, whether it is based on individual or social flow experience, self-reports are subjective measurement tools. An observation-based objective group flow measure could definitely broaden our perspective on (social) flow

### **Implications**

Studying flow as a collective phenomenon is a promising area of research which will contribute to our understanding of group processes and collaborative creativity. As suggested by Walker (2010) social flow occurs through various conditions such as the balance between competence of group members and their skills, familiarity of group members with each other as well as with the task, coordination and cooperation, paying attention to each other, receiving task feedback from each other, etc. Each of these conditions could be tested in experimental settings. Moreover, as empathy was an important predictor of flow experience in social settings, applied research could focus on how to use and train empathy skills as a tool to increase flow experiences in group

## Chapter 2 – Social Flow in Performance Arts

contexts. Recently, there has been an interest in the role of synchronous interaction to enhance interpersonal understanding and group interaction (Baimel, Severson, Baron & Birch, 2015; Tuncgen & Cohen, 2016). Perhaps, inducing interpersonal bonding through synchronisation training could also contribute to the achievement of social flow. Finally, researchers might also want to consider how exactly empathy is linked to flow and what mediates this relation. Research by Dobson and Gaunt (2015) suggested that maintaining good social communication with co-performers is an important factor for the success of an orchestra performance. Likewise, Murnighan and Conlon (1991) found that quartets where members had good conflict resolution skills were in harmony. In sum, further discovering the mechanism that link empathy and social flow would be a fruitful area of research.

### **Conclusions**

Collectively, the current research contributed to our knowledge about social flow experience by exploring it in three different performance art domains. Although domain or timing of the performance (i.e., cohort) did not have an influence on the level of flow, group members' empathy level as well as their motivations (particularly more self-deterministic types) were associated with higher flow states. In that sense, findings of the study can give a more definite answer regarding the mixed findings about the relation between flow and intrinsic motivation. The current findings also confirmed the link between empathy and flow, in line with previous qualitative research. This association between flow and empathy was strongest in dancers, followed by orchestra members and musical theatre actors. Thus, dance provided a unique context to reach flow experience compared with other art domains. Therefore, while domain might not affect the flow experience directly, it might be significant moderator which affects the relationship between flow and other psychological variables. Since flow and creativity are strongly linked concepts, in a way these findings contribute to ongoing discussion

## Chapter 2 – Social Flow in Performance Arts

about domain-specificity in creativity (Baer, 2010; 2012; Sullivan & Ford, 2010).

Runco (2004) stated that the concept of domains “must be acknowledged because most of what has been uncovered about creativity is domain specific” (p. 678).

Understanding the determinants of social flow experience might ultimately also help in understanding the (group) processes that lead to achievements in collaborative creativity. Building on these findings, the next chapters of this thesis further investigated the role of interpersonal understanding and intrinsic motivation in collaborative creativity process.

### **CHAPTER 3 – CREATIVITY IN CONNECTEDNESS: CLOSENESS AND PERSPECTIVE TAKING IN GROUP CREATIVITY**

A recent report by multinational professional services firm Deloitte published the results of a survey conducted with more than 7000 executives in more than 130 countries. It suggests that the demand for and popularity of teamwork has reached its peak point. Almost half of the executives surveyed reported that they are either putting more emphasis on team work or are initiating it among their workforce (Ryder, 2016). Increasing employees' creativity and a company's creative outputs was one of the main reasons for supporting teamwork in professional settings.

Creativity is often defined as the generation of novel and useful ideas, solutions, or insights (Amabile, 1996; Runco, 2004). Theories of group creativity are mostly inspired by input-process-output (IPO) models developed in the team work literature (West, 2002; West & Anderson, 1996). IPO models of group creativity regard the group task (e.g., providing service), the composition of the group (e.g., team diversity, team size, team longevity), and the group's organizational context (e.g., manufacturing, health service) as the main inputs, and the number of innovations and innovation quality (e.g., novelty, effectiveness) as the main outputs. Group processes (e.g., participation of members, support for innovation, safety, leadership, task orientation, cohesion, task and relationship conflict, external and internal communication) connect group inputs and outputs (Hulsheger et al., 2009; West, 2002). According to Hulsheger et al.'s (2009) meta-analysis, such group process variables play a key role in group creativity. However, previous studies of group creativity mainly focused on factors differentiating individual creativity from group creativity and how the characteristics of the group or task, (i.e., "inputs" in IPO models) influence creativity (Bechtoldt et al., 2010). Despite their critical importance, we still have rather little understanding about the processes through which group collaborations result in creativity.

Conceiving groups as information processors, De Dreu, Nijstad, and Van Knippenberg's (2008) theory of motivated information processing in groups (MIP-G) integrates cognitive and motivational aspects of group decision making which also apply to group creativity (Bechtoldt et al., 2010). Specifically, the MIP-G theory postulates that when individuals engage in group information processing they are driven by either epistemic or social motivation. Epistemic motivation is defined as the individual's "willingness to expend effort to achieve a thorough, rich and accurate understanding of the world, including the group task or decision problem at hand" (De Dreu et al., 2008, p. 23). The higher epistemic motivation, the more group members care more about acquiring rich and accurate information. Social motivation, on the other hand, is a dichotomous variable which reflects individual's preference towards distribution of outcomes as either proself (i.e., interest in one's own outcomes) or prosocial (i.e., interest in collective outcomes). According to MIP-G, although epistemic and social motivations are orthogonal; they serve different functions (De Dreu et al., 2008). Yet, the right combination of epistemic and social motivation (e.g., a group high in prosocial and epistemic motivation) may facilitate group members in conducting effective information processing and eventually contribute to high quality group decisions. Both social and epistemic motivations can stem from either dispositional or situational antecedents (Bechtoldt et al., 2010; De Dreu et al., 2008).

The current research examines group creativity in light of the MIP-G model by looking at group process variables which were not given enough emphasis in group creativity research (Bechtoldt et al., 2010). Specifically, on the basis of previous research which showed that self-disclosure increases group cohesiveness (Kirshner, Dies & Brown, 1978), I proposed that self-disclosure creates a perceived closeness in the group which can increase the social motivation aspect of groups. Perceived closeness is a potential trigger for prosocial motivation in groups as it promotes liking

(Certner, 1973) and, thus, might motivate cooperative interactions in the group.

According to MIP-G theory, one effective way of increasing epistemic motivation of group negotiators is perspective taking (De Dreu & Carnevale, 2003). Consequently, I proposed that perspective taking can be a potential trigger of epistemic motivation in group creativity context as it allows members to be more attentive to and process different ideas (see De Dreu et al., 2011; Somech, 2006). Thus, perspective taking and closeness might be two distinct and necessary interpersonal process variables which increase group creativity. In the current study, I manipulated levels of perspective-taking and closeness experimentally to investigate their distinct and combined effects on group creativity.

### **Closeness and Group Creativity**

How people think, feel and relate to each other is arguably important in any group interaction. However, the role of interpersonal bonds for group creativity is still debated in the literature. One reason might be that there are different conceptualizations of interpersonal bonds in group, such as cohesion, psychological safety, or having weak versus strong ties (e.g., Edmondson, 1999; Perry-Smith, 2006; Perry-Smith & Shalley, 2003). Cohesion has been conceptualized as a multidimensional construct including interpersonal attraction between group members, task commitment, and group pride (Festinger, 1950). Cohesion has been found to create a psychologically safe and motivating environment for group members to take more risks and eventually be more innovative (Craig & Kelly, 1999; Hulsheger et al., 2009; Mullen & Copper, 1994; West & Wallace, 1991). In contrast, Staw (2009) argued that although groups need coordination, norms and cohesion for group formation, these processes can lead to a sense of homogeneity which might limit the variety of inputs and hence, potentially harm the creativity of group. To understand the role of interpersonal processes in group creativity, the present study experimentally investigated the role of closeness.

Successful exchange of information is often driven by perceived attractiveness of communication partners (Ziebro & Northcraft, 2009). One way to build reciprocal attraction between group members is increasing the level of perceived psychological closeness. Closeness has been mostly operationalized as a multidimensional construct that has multiple aspects including behavioural closeness (i.e., frequency and diversity of contact; Berscheid, Snyder & Omoto, 1989), emotional closeness (i.e., increased liking; Rubin, 1970) and cognitive closeness (i.e., overlap of mental representation of self with the other; Aron, Aron & Smollan, 1992). Here, I define closeness as the perceived connectedness or interconnectedness of self and other (Aron et al., 1992; Aron, Melinat, Aron, Vallone & Bator, 1997; Seidikides, Campbell, Reader & Elliot, 1999). In that sense, closeness is similar to intimacy (Reis & Shaver, 1988) or one-ness (Cialdini, Brown, Lewis, Luce & Neuberg, 1997).

Closeness, as defined in this study, can be achieved through self-disclosure, that is the willingness to disclose (private) information to others and opening up to another person or a group (Aron et al., 1997). This is important for the development and maintenance of relationships as it can promote a sense of connectedness regardless of whether disclosers are strangers (Collins & Miller, 1994). Self-disclosure provides access to additional information about individuals and, if that information is positive, leads to positive impressions and increased liking (Aron et al., 1997; Collins & Miller, 1994; Sprecher & Duck, 1994). Self-disclosure is traditionally defined as the process in which a person opens up to another person or a group (Cozby, 1972).

The effect of self-disclosure on group processes has been investigated since the 1960s (Archer & Earle, 1983). In this research, increased self-disclosure was associated with decreased interpersonal distance in groups (Bunch, Lund & Wiggins, 1983). Experimental manipulations of self-disclosure were linked with increased group cohesiveness (Kirshner, Dies & Brown, 1978). Elias, Johnson and Fortman (1989)

focused specifically on task-based self-disclosure in groups (i.e., exchange of information concerning facts and feelings towards the task) and found that self-disclosure increased group cohesiveness, members' commitment to the task as well as group productivity. Thus, increasing closeness through self-disclosure can foster social coordination and social bonds. However, as of now, whether and how closeness affects group creativity has not been investigated yet. In line with MIP-G theory, I proposed that groups formed of members who feel more close to one another (i.e., group members who report an increased self-other overlap) will produce more creative outputs than those groups whose members feel more distant to one another.

### **Perspective-Taking and Group Creativity**

Perspective taking is an important social skill significant for healthy social relationships and social coordination and interaction (Davis, 1983; Piaget, 1932). Parker, Atkins, and Axtell (2008) define perspective taking as an active process that: “occurs when an observer tries to understand, in a non-judgmental way, the thoughts, motives, and/or feelings of a target, as well as why they think and/or feel the way they do” (p. 151).

A number of studies demonstrated the positive role of perspective taking for group processes and group outcomes (Ku, Wang & Galinsky, 2015). For instance, Taggar (2002) highlighted that problem solving increased with the efforts of recognizing each group member's viewpoint and ideas. Falk and Johnson (1977) showed that groups in which members took the perspective of others had greater cooperation, better communication, more trust, and satisfaction. Furthermore, the perspective taking abilities of group members facilitated a supportive environment within teams (Wolff, Pescosolido, & Druskat, 2002) and the forming of social bonds by decreasing prejudice and stereotyping (Galinsky & Ku, 2004; Galinsky & Moskowitz, 2000).

Perspective taking can also be a key process in creativity as it motivates members to be receptive to diverse perspectives which, in turn, can enhance group members' chances of developing novel and useful ideas (Perry-Smith & Shally, 2003; Perry-Smith, 2006). From the MPI-G perspective, perspective taking can be a source of epistemic motivation needed for effective information processing (De Dreu & Carnevale, 2003) which allows individuals in the group to expand their knowledge base (Csikszentmihalyi & Sawyer, 1995). Perspective taking can be particularly helpful during the process of idea selection (Silvia, 2008) and for defining a desirable standard of usefulness (Grant & Berry, 2011).

To the best of my knowledge, there is only one experimental study that investigated the role of perspective taking in group creativity. Hoever et al. (2012) found that the effect of a team's diversity on creativity was moderated by group members' level of perspective taking. Diversity refers to the differences in members' perspectives about a task. In their experiment, 77 three-person teams were developing a creative plan to improve a hypothetical theatre. Results showed that diverse teams generated more creative plans only when they were required to take others' perspectives. The effect of perspective taking on creativity was driven by increased information elaboration within the groups. However, it is still an open question as to whether perspective taking is beneficial for all creative groups (i.e., non-diverse groups) and whether it also has a direct effect on group creativity (Ku et al., 2015). Here, I investigated whether perspective taking directly affected group creativity by itself and in combination with closeness. On the basis of research pointing to various benefits of perspective taking for group processes and outcomes (Falk & Johnson, 1977; Ku et al., 2015; Wolff, et al., 2002) groups formed by members with higher perspective taking should be expected to produce more creative outcomes.

An influential model for understanding how perspective taking operates is De Waal's (2008) "Russian Doll" model of empathy and imitation. According to the model, empathic reactions are initially triggered by the core automatic and non-conscious tendencies. Once they become more conscious, self-other distinctions become more distinctive and perspective taking is used in order to ensure the selected coordination and cooperation goals. Here, I build on this model and treat perspective taking as a conscious and effortful process that is actively taken by group members to ensure cooperation and coordination in group processes. In contrast, closeness is a more automatic process which results from knowing more about others or liking (Sprecher, Treger & Wondra, 2013).

### **Closeness and Perspective Taking in Group Creativity**

Although I conceptualized perspective taking and closeness as independent constructs I also wanted to test how manipulating both perspective taking and closeness simultaneously affects group creativity. As discussed above, perspective taking and cognitive closeness could increase group members' epistemic and social motivation as conceptualized in the MIP-G model (De Dreu et al., 2008). Thus, from this perspective, groups high in perspective taking *and* closeness should increase group performance and creativity. On the other hand, high levels of interpersonal harmony or cohesion have been shown to have negative effects on group outcomes. Groups which are highly empathic, highly accepting, and displaying higher levels of self-disclosure tend to be more cohesive (Roark & Sarah, 1989). Janis (1972) argued that cohesion might lead to group think which often inhibits divergence within the group and thus jeopardizes the creativity of groups (Jaussi & Dionne, 2003). Thus, from this point of view, perspective taking *and* closeness might lead to highly connected groups which are expected to arrive at less creative outputs. The current study allowed me to investigate these alternative hypotheses.

### **Group output variable**

Most of the group creativity research has used brain storming tasks to measure groups' creative outputs (e.g., Mullen, Johnson, & Salas, 1991; Nijstad, Diehl & Stroebe, 2003; Paulus & Yang, 2000). Brainstorming is an additive task that primarily requires participants to produce divergent ideas. Thus, these studies operationalize creativity as divergent thinking and measure groups' fluency, flexibility, originality, and elaboration (Paulus, 2000). According to Silvia et al. (2008), measures of divergent thinking mostly evaluate creativity on the basis of how unique participants' responses are. However, not all research conceptualizes creativity as equivalent to divergent thinking (Runco & Acar, 2012). Furthermore, brainstorming does not capture the dynamics of real life groups which are working on tasks that require more complex group coordination skills rather than simply exchanging novel ideas (Craig & Kelly, 1999). Thus, along with others (e.g., Sawyer, 2011) I believe that relying on brainstorming tasks limits the extent to which empirical studies can answer questions about (real-life) group creativity.

Consequently, I assessed group creativity with a collaborative story writing task, a method which has not been used in the adult group creativity literature. Collaborative story writing was inspired from individual story-telling task of Hennessey and Amabile (1988). It is not an additive task, but requires group members to combine, elaborate, and implement ideas in a meaningful way that will result in one single product. Therefore, it allows assessing aspects of group coordination that occur throughout the different stages of the creative process. Furthermore, collaborative story writing has high face validity as it shares some similarity to the creative performances in real life verbal and artistic creativity tasks (Hennessey & Amabile, 1988). In the current study, creativity on the story writing task was assessed with the consensual assessment technique, which has been regarded as a robust way of assessing creativity as it is “based on the actual

creative performances or artefacts, and it mimics the way creativity is assessed in the ‘real world’ (Baer & McKool, 2009, p.67).

### **Research Aims**

In sum, the objectives of this study were to investigate the effects of closeness and perspective taking on group creativity, both separately and combined. I expected that closeness or perspective taking would separately increase group creativity. However, concerning the combined effect of closeness and perspective taking, I advanced two alternative hypotheses. Based on the MIP-G model, I expected that a combination of perspective taking and closeness would increase group creativity. Based on research on the negative effects of group cohesion, I expected that a combination of perspective taking and closeness would decrease group creativity.

## Method

### **Participants**

The study involved 183 participants (80 females, 103 males;  $M_{Age} = 26.22$  years,  $SD = 4.74$ ; age range = 18 to 56 years) who were assigned to 61 three-person groups. Most of the participants were students at universities in Berlin, Germany and were recruited through the collaborating institute’s participant pool. All participants were compensated with 15 euros each with a chance to additionally win 20 euros each if their group’s story was rated as the most creative (see below).

### **Design and Procedure**

The study received ethical approval from the institute’s Human Ethics Committee. Each step of the study was conducted in German. The study employed a 2x2 between-subject design with perspective taking (perspective taking manipulation; no perspective taking manipulation) and closeness (closeness manipulation; no closeness manipulation) as between-subject factors. Overall, groups were randomly

assigned to four experimental conditions: (1) closeness and perspective taking (combined) condition ( $n=15$ ); (2) perspective taking condition ( $n=16$ ); (3) closeness condition ( $n = 15$ ); and (4) no manipulation (control) condition ( $n=15$ ). Both closeness and perspective taking were manipulated experimentally. The combined condition groups received both manipulations.

Upon arrival, three participants were seated at a round table at equal distance from each other so they could see and hear each other clearly. Before the experiment started they were informed about the ethical approval, anonymity of the data, and right to withdraw, and participants signed the consent form based on this information. All group interactions were video-taped.

**Experimental Manipulations.** Before the groups engaged in the experimental task (creating a story), participants in the three experimental conditions received experimental manipulations. *Perspective taking* was manipulated following Hoever et al. (2012). Groups in the combined and perspective taking conditions were given written instructions that asked them to take all other members' perspective as much as possible during the task. Specifically, they were invited to imagine themselves as if they were in the other participants' shoes. Instructions also included specific examples of perspective taking, such as trying to understand what is important to the other person and why the other person responds in a particular way (see Appendix 1.1).

*Closeness* was manipulated through self-disclosure. Previous studies suggested that a temporary sense of closeness can be induced in strangers through the manipulation of situational conditions (Fraley & Aron, 2004), such as gradual escalation of self-disclosure (Aron et al., 1997) because self-disclosure has been found to be an effective way of creating feelings of closeness between people (Collins & Miller, 1994). This research provided the foundation for the closeness manipulation in the current project. The self-disclosure manipulation was inspired by the Relationship

Induction Self-disclosure Task (RCIT; Sedikides et al., 1999) which works on the principle that interpersonal self-disclosure is dependent on reciprocal disclosing and aims to create this type of self-disclosure in the laboratory. The RCIT consists of three lists of questions which become gradually more personal. It encourages participants to share the answers of these questions in a natural conversation-like way as much as possible. Groups who received closeness manipulations were asked to answer the questions that I adapted from Lists I and II of RCIT question list. Specifically, participants answered, verbally and in writing, questions regarding their names, profession, work place or university, their hobbies, their likes and dislikes, and expectations and fears for the future (See Appendix 1.2).

After participants were briefed about the study task and signed the consent form, they were given instructions to briefly answer the questions that I adapted from RCIT in writing. Once they finished writing, each member exchanged his/her answers with the group member sitting to his/her right, and this was repeated again to enable all members to read each other's answers. Participants' written personal statements were destroyed immediately at the end of the session.

Groups in the combined condition first received the closeness before the perspective-taking instructions. Groups which were assigned to the control condition were only given instructions on how to write the story.

**Experimental Task.** A collaborative story writing method, inspired by Hennessey and Amabile's (1988) storytelling task to assess children's individual creativity, was used in the current study. This technique has proven to be a valid and practical way of assessing individual creativity in a short time frame, without any requirement for special materials. In the current study, the story-writing task was modified slightly to make it more appropriate for adults and for evaluating group



given questionnaires on perspective taking and inclusion of self in the group. At the end of the experiment, participants were debriefed, paid, and thanked.

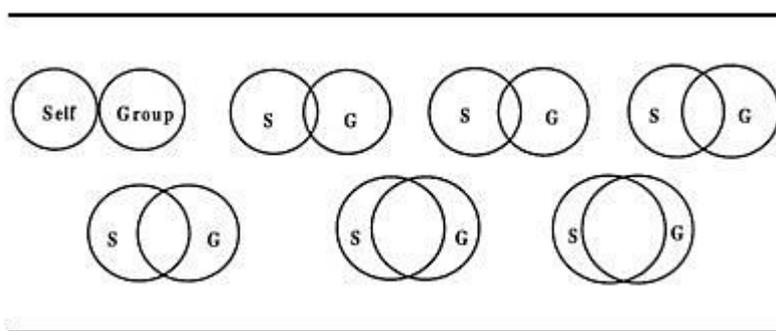
## Measures

**Perspective Taking Manipulation Check.** To ensure that the perspective taking manipulation worked, participants were asked to indicate their degree of perspective-taking on four items adapted from the perspective taking scale developed by Davis et al. (1996). Items included “I made an effort to see the world through the group members’ eyes,” “I imagined how the group members were feeling.” Participants answered these items on a 7 point Likert scale, from “Not at all” (1), to “Very much” (7). For each participant, an individual perspective-taking score was calculated consisting of the average of the four items ( $\alpha = .80$ ).

**Closeness Manipulation Check.** The “Inclusion of other in the self” (IOS) scale (Aron et al., 1992) is a well-used, validated, one-item interpersonal closeness scale. The scale is designed to measure overlap between self and other, however it does not distinguish whether self is being included in the other or the other is being included in self. For this reason, it is argued to be measuring perceived closeness in the general sense (Galinsky et al., 2005)

I used the Inclusion of the Ingroup in the Self Scale (IIS; Tropp & Wright, 2001), which was an adapted version of IOS scale for measuring the degree to which individuals include a specific ingroup in the self (see Aron et al., 1997). The IIS asks participants to rate their interconnectedness between self and the group by picking one out of 7 representations of closeness depicted by two (overlapping) circles. One end of the scale corresponds to 1, “not at all close”, represented by the image of the two circles next to each other and not intersecting. The other end of the scale corresponds to 7, “very close”, depicted by the two circles overlapping almost completely. Between those

two extremes, five images depict various degrees of closeness represented by the proportion of intersection between the two circles (see Figure 3.2).



*Figure 3.2.* Inclusion of the Ingroup in the Self Scale (Tropp & Wright, 2001)

**Creativity Judgement.** Amabile (1982, 1996) proposed that defining an ultimate objective criterion for evaluating creative products would be impossible since this evaluation depends on the social context. She suggested that the most valid way of measuring the creativity of products would be relying on the subjective assessment of experts in the particular domain, a method labeled “consensual assessment technique.” Briefly, in consensual assessment, experts rate the creativity of the product by using their own, subjective definition of criteria rather than using an established objective criterion. Therefore, I asked experts to rate the creativity level of each story on the basis of their own, subjective definition of creativity. Following Amabile (1982, 1996), four experts rated all 61 stories. All experts had a Master’s degree in German Literature and had experience in evaluating and writing stories. A rating guideline was prepared for raters based on the evaluation criteria adapted from Hennessey and Amabile (1988), Alhusaini, Maker and Deil-Amen (2014), and Pople (2014). Experts rated the stories on eight dimensions on a 10- point scale. Dimensions were presented with short definitions: Creativity (“using your own subjective definition of creativity, please rate the degree to which the story is creative”); Imagination (“rate the degree to which

subject/plot is imaginative”); Novelty (“rate the degree to which subject/plot is novel”); Liking (“using your own subjective criteria, how well do you like the story?”); Emotionality (“rate the amount and depth of emotion the story conveys); Voice (“rate the level of use of voice in the story, the sense of audience”); Characterization (“rate how well characters are written”); Elaboration (“rate the level of elaboration of details in the story”).

The judges’ ratings of the 61 stories correlated highly ( $r_s = .70 - .79$ ) indicating a good level of inter-rater reliability. Considering the high level of correlations between dimensions ( $r = .86-.90$ ), I conducted an exploratory factor analysis on the ratings of the eight dimensions using direct oblimin rotation. The Kaiser-Meyer-Olkin measure of sampling adequacy was .90, above the commonly recommended value of .6, and Bartlett’s test of sphericity was significant,  $\chi^2(28) = 637, p = .000$ . The analysis yielded a single factor solution with loadings between .54-.89 on a first factor, which explained 80 % of the variance (eigenvalue > 1). Hence, all the dimensions of ratings were combined and averaged into one overall creativity score for each story.

## Results

### **Preliminary Analyses**

Consistent with my conceptualisations of closeness and perspective as group level constructs, I used groups as units of analysis for these constructs. Before aggregating the individual responses, I assessed whether the agreement within groups was sufficient (Bliese, 2000) using the median  $r_{wg}$  values (i.e., how much members in a group give similar responses). Median of perspective taking scores’  $r_{wg}$  values was .87, above the generally accepted cut-off of  $r_{wg} = .70$ , using a uniform expected distribution (James, Demaree, & Wolf, 1993). Closeness scores’  $r_{wg}$  median was .75, just at the generally accepted threshold. Following suggestions of Bliese (2000), I also calculated the scale Intra-class Correlations (ICC) for perspective taking in order to index within

and between group variance (ICC1) as well as the reliability of group level means (ICC2). Both ICCs were within the generally acceptable range (.17, .38, respectively). ICC(2) coefficient for perspective taking were lower than ideal, but comparable to previous findings on group level perspective taking (Hoever et al., 2012). Closeness ICCs revealed a similar profile (.14, .34, respectively). Despite being lower than ideal, these ICC values are previously observed in team based research (see Woehr et al., 2015 for a review). Moreover, both perspective taking and closeness revealed acceptable  $r_{wg}$  values. Therefore, I averaged the individual member scores into composite group scores of closeness and perspective taking.

### **Manipulation Checks**

**Closeness.** I conducted a two-way Analysis of Variance (ANOVA) to test for the effect of self-disclosure (manipulation, no manipulation) and perspective taking manipulation (manipulation, no manipulation) on closeness measured by IIS. Analysis yielded a significant main effect of self-disclosure,  $F(1,57)= 5.37, p=.02, \eta^2= .09$ . Teams that received self-disclosure manipulation ( $M= 5.32, SD= .78$ ) reported higher levels of closeness compared to teams that did not receive it ( $M= 4.90, SD= .66$ ). There was no effect of perspective taking manipulation,  $F(1,57)= 2.41, p=.13, \eta^2= .04$ , and the interaction between two conditions was not significant either,  $F(1,57)= .50, p=.48, \eta^2= .01$ . Results suggested a successful manipulation of closeness (see Table 3.1)

**Perspective Taking.** I conducted another two-way ANOVA to test for the effect of the self-disclosure and perspective taking manipulations on the perspective taking score. Analysis yielded a significant main effect of perspective taking,  $F(1, 57) = 4.90, p=.03, \eta^2= .08$ . Teams that received perspective taking manipulation ( $M=4.96, SD= .70$ ) reported higher mean scores of perspective taking compared to teams that did not receive it ( $M= 4.58, SD= .64$ ). There was no effect of closeness manipulation,  $F(1, 57)= .29, p=.41, \eta^2= .01$ , and the interaction between two conditions was just

below significance,  $F(1,57)= 3.90, p=.07, \eta^2= .06$ . These results suggested a successful manipulation of perspective taking (see Table 3.1).

Table 3.1  
*Perspective taking and closeness means according to experimental conditions*

	<u>Perspective Taking</u>		<u>Closeness</u>	
	M	SD	M	SD
Closeness	4.67	.70	5.24	.90
Perspective Taking	5.20	.73	5.10	.64
Combined	4.71	.61	5.40	.67
Control	4.48	.68	4.68	.64

*Note.* M= Mean, SD= Standard Deviation

### **Descriptive Analyses**

Table 3.2 summarizes the descriptive statistics of and correlations between the study variables. Group creativity scores were not correlated with the closeness or perspective taking scores. On the other hand, there was a significant positive correlation between perspective taking and closeness.

Table 3.2  
*Correlations among closeness, perspective taking and group creativity scores (N=61)*

	M	SD	Min	Max	Group		Perspective
					Creativity	Closeness	Taking
Group Creativity	5.53	1.29	2.42	9.06	1	.16	.15
Closeness	5.11	.75	3.67	6.33		1	.35**
Perspective Taking	4.77	.70	3	6.33			1

*Note.* \*\*,  $p < .01$

### **Creativity of Groups**

I conducted a 2x2 ANOVA to test for the influence of the closeness (closeness vs. no closeness) and perspective taking manipulation (perspective taking vs. no perspective taking) on creativity ratings. The ANOVA yielded a significant main effect of Closeness,  $F(3, 57) = 3.7, p = .03, \eta^2 = .06$ , a marginally significant main effect for Perspective Taking  $F(3, 57) = 3.78, p = .06, \eta^2 = .06$ , and a significant interaction effect of Closeness x Perspective Taking,  $F(3, 57) = 9.6, p = .003, \eta^2 = .14$ . Groups that received the closeness manipulation received a higher creativity score for their stories ( $M = 5.82, SD = 1.23$ ) than groups that did not receive the manipulation ( $M = 5.25, SD = 1.30$ ). Groups that received the perspective taking manipulation ( $M = 5.25, SD = 1.05$ ) received a lower creativity score for their stories than groups who did not receive the manipulation ( $M = 5.82, SD = 1.46$ ).

As can be seen in Figure 3.3, among the groups that received closeness manipulation, group creativity scores were significantly lower for groups that received closeness combined with perspective taking manipulation ( $M = 5.07, SD = .99$ ) compared to groups that only received closeness manipulation ( $M = 6.57, SD = .98$ ). However, among the groups that were not given closeness manipulation, the groups which received only perspective taking manipulation ( $M = 5.42, SD = 1.12$ ) did not differ from groups which were not given any of the manipulations ( $M = 5.06, SD = 1.50$ ). Therefore, while receiving only closeness manipulation increased group creativity, combination of closeness with perspective taking negatively influenced creativity ratings of the groups.

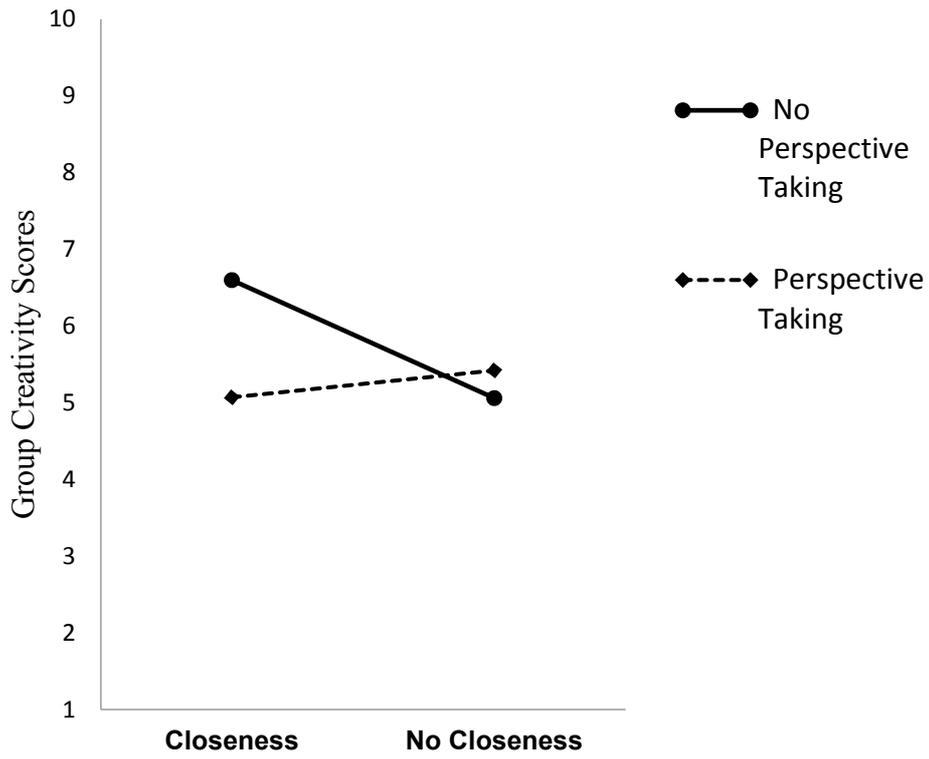


Figure 3.3 .The effect of perspective taking and closeness on group creativity

### Discussion

Despite the increasing importance of group creativity in work and educational contexts, the role of interpersonal bonds for creative group processes is unclear. This is surprising, since one of the key factors that differentiates group from individual creativity are the interpersonal relations and interactions between members of creative groups. This study was thus designed to address this lacuna. It investigated whether and how experimentally manipulated perspective taking and closeness between group members affected the creative outputs of groups. I hypothesized that both perspective taking and closeness would separately increase groups' creativity compared to groups who did not receive these manipulations. I also assessed how manipulating both perspective taking and closeness would affect the creative outputs of groups.

I used a collaborative story writing method as a means to assess group creativity. This method has not been used in the group creativity context before, but storytelling is used as a method to measure individual creativity (Hennessey & Amabile, 1988). Using this collaborative story writing task has several advantages and I believe that this method could be a good alternative to the brainstorming tasks commonly used in the group creativity literature. First, this collaborative story writing was observed to be a very engaging task, and it shares similarities to artistic and group creativity in real-life settings, unlike brainstorming (Hennessey & Amabile, 1988; Sawyer, 2011). Second, creativity was assessed with the consensual assessment technique, a robust way of assessing creativity through the actual creative performance rather than measurement of creativity skills or traits (Baer & McKool, 2009). Consensus between the judges' ratings of the creativity of the produced stories was high and demonstrated that collaborative story writing method was reliable to evaluate creativity of groups. Finally, the collaborative story writing task can overcome some of the limitations of tasks that assess creativity as divergent thinking, such as brainstorming tasks (Paulus, 2000).

Silvia et al. (2008) criticized divergent thinking tasks as relying too much on uniqueness scores which can lead to three problems. First, uniqueness scores often confound number of unique responses (creativity) with the number of responses generated (fluency). Second, not all unique responses are truly unique as some of them will be inappropriate for the task. Finally, coming across unique responses in small samples is easier than in large ones, as what is unique will change as samples get larger. Since group creativity studies often rely on small sample sizes, this might overestimate the uniqueness/creativity score of groups.

#### **The effect of closeness and perspective taking on group creativity**

First, the results indicated that perspective taking and closeness can be successfully manipulated experimentally. Manipulation checks showed that groups that received closeness manipulation reported higher levels of closeness than the groups that did not receive that manipulation, and groups that received perspective taking instructions reported higher perspective taking scores compared to groups that did not receive those instructions. Thus, I concluded that appropriate levels of closeness and perspective-taking were generated with brief experimental manipulations. I hope that these findings encourage others to conduct experimental studies particularly about interpersonal processes as they play a key role in group creativity (Hulsheger et al., 2009).

The stories of groups that received the closeness manipulation were rated as more creative compared to stories by groups that did not receive the manipulation. So far, no study has experimentally investigated the role of closeness in group creativity. I conceptualized closeness as cognitive closeness which can be achieved through reciprocal self-disclosure (Aron et al., 1992: 1997). Experiencing self and other as one coherent unit creates a sense of closeness in the group that could prompt group members to take decisions that benefit the collective rather than the self (Tu, Shaw &

Fishbach, 2016). In that sense, closeness provides the social motivation aspect which is stated as one of the essential drivers of group creativity in the MIP-G model (De Dreu et al., 2008). Relatedly, Galinsky et al. (2005) suggested that an increased perception of self-other overlap has positive effects on group processes and outcomes and can lead to better social coordination. Thus, findings of the current study suggest that increasing particularly group members' motivation to achieve group (rather than individual) goals might be an important factor in group creativity. Future research might want to investigate whether other processes that have been shown to increase group members' "prosocial" motivation also positively affect group creativity. For example, Bornstein, Gneezy and Nagel (2002) found that competition between groups improved the (prosocial) motivation, coordination, and cooperation within groups, leading to better outcomes.

I found that groups who received the perspective taking manipulation received lower ratings of creativity compared to groups who did not receive the manipulation. This finding was surprising considering the reported benefits of perspective taking for groups and its potential to set the necessary ground for social coordination. Specifically, perspective taking has been shown to increase liking, closeness, helping, decrease prejudice and stereotyping (Sprecher et al., 2013; Galinsky et al., 2005) as well as facilitating mimicry and behavioural coordination (Galinsky et al., 2008). On the other hand, perspective taking has been known for its detrimental effects on group outcomes as well (Galinsky et al., 2015). Perspective taking is an effortful process that requires time, motivation (Lin, Keysar & Epley, 2010) and demands attentional resources (Apperly, Riggs, Simpson, Chiavarino, & Samson, 2006). Perspective taking is less successful when individuals are busy with another task that creates cognitive load (Davis et al., 1996; Roßnagel, 2000). It is possible that writing a story collaboratively in

a short time might have created such harmful cognitive load that participants lost some of their creative potential while trying to attend to others' perspectives.

Paying attention to others' ideas can also be harmful in for group productivity (Gummerum, Leman & Hollins, 2014), and this also corresponds to earlier research on group creativity. Hoever et al. (2012) argued that perspective taking is only beneficial if there is functional diversity within group members. In a homogenous team, attending to the perspective of others might likely to cause group members to quickly reach a common ground and stop looking for different or new ideas. Indeed, Hoever et al. (2012) found that perspective taking moderated the effect of diversity on group creativity; diversity in the group increased group creativity only when members engaged in perspective taking. Since I did not manipulate functional diversity or any other aspect of diversity (i.e., background, gender, age), it is possible that the homogeneity of group members might have offset the benefits of perspective taking in the current study.

Despite these findings, it would be premature to discard the benefits of perspective-taking in group creativity, as perspective-taking has been shown to be an important antecedent for individual creativity (Grant & Berry, 2011; Mohrman, Gibson, & Mohrman, 2001) and an important moderator for group creativity (Hoever et al., 2012). There is need for more research to understand when perspective taking might be helpful or harmful for group creativity and what other possible mediators, besides group member diversity (e.g., the cognitive load of the task; Roßnagel, 2000) could affect the relationship between perspective taking and group creativity.

Concerning the effect of closeness and perspective taking on group creativity, I advanced two alternative hypotheses. Following the MIP-G model, a combination of perspective taking and closeness could increase group creativity. However, based on research on the negative effects of group cohesion, a combination of perspective taking

and closeness could decrease group creativity. These findings are more in line with the latter hypothesis: Receiving both closeness and perspective-taking manipulations did not benefit the creativity of the groups.

Although I proposed and found that closeness and perspective taking is orthogonal with distinct effects, I also suggested that they might have an additive effect. When group members knew more about each other (i.e, self-disclosure) and hence felt closer with their group and at the same time tried to be attentive to each other's ideas, group members might feel overly connected with each other. In other words, such groups might be highly harmonic and bonded compared to the groups which received one or none of these manipulations.

Increased harmony in groups might lead to increased cohesion which can create groupthink, increased conformity (Janis, 1972), and decreased creativity (Jausssi & Dionne, 2003; Staw, 2009). Based on the findings, I would argue that while an optimal level of connectedness or closeness is beneficial for the creativity of groups, additive effects of closeness and perspective taking might result in elevated levels of connectedness is more harmful than beneficial for group creativity. Some researchers suggest that the relation between cohesion and creativity might be curvilinear (Paulus et al., 2012; Woodman, Sawyer & Griffin, 1993). Although I did not directly tested cohesion, findings cautiously indicate that there might be an optimal level of interpersonal cohesiveness for collaborative creativity.

### **Limitations**

While this study sheds light on the factors contributing to group creativity, it nevertheless has some limitations that could be addressed in future research. First, I employed a single-item measure for closeness. While the IOS is a well-established measure to assess self-other overlap, alternative scales, such as “We-ness” (Cialdini et al., 1997), Dynamic IOS (Hodges, Sharp, Gibson & Tipsord, 2011), or the perceived

similarity scale (Batson et al., 1997) could be additionally employed. Second, employed measures of perspective taking and closeness are all individual experience measures. Although I was able to observe group-related differences, these differences might be underestimated due to use of individual-level measures. Thus, future studies should additionally include group based measurements, such as the Team Emotional Intelligence scale (Jordan & Lawrence, 2009) or the cooperative group norm scale (Chatman & Fynn, 2001). Third, surprisingly I found that perspective taking had negative effects on group creativity. One reason for this could be the nature of the perspective taking instructions. Myers, Laurent & Hodges (2014) stated that there are two commonly-used perspective taking instructions leading to distinct effects, “imagine other” instructions (considering another’s perspective, used in the current study) and “imagine self” instructions (i.e., imagining oneself in the shoes of the other person). Myers et al. (2014) found that “imagine self” instructions led to greater self-other overlap and greater likelihood of helping behaviour. Therefore, future research could manipulate perspective taking with different instructions and their effect on group creativity.

### **Implications**

One interesting finding of the present study was that the level of connectedness (i.e., closeness) in the group needed to be “optimal” to produce positive effects for creativity. Future research should continue to examine the effect of interpersonal process variables like closeness in an experimental context. A possible research avenue would be to create groups with different length and intensity of closeness manipulations, for example by assigning participants to groups depending on their attachment styles or their mutual liking levels (Aron et al., 1997), by manipulating levels of trust of individual members (Holmes & Rempel, 1989, cited in Aron et al., 1997) or by observing groups longitudinally (Aron et al., 1997). Furthermore, observing

## Chapter 3 – Creativity in Connectedness

how groups with varying levels of closeness exhibit joint engagements and dialogues might be a good indicator of the collaborative creative process (MacDonald, Miell, Morgan, 2000). Finally, despite the rise of interactions in virtual settings and attempts to aid designs of virtual collaborations, there is still much left to do in terms of virtual collaborative creativity (Burkhardt & Lubart, 2010). Given that virtual groups rarely meet in person (Hinds & Kiesler, 2002, cited in Ilgen, Hollenbeck, Johnson & Jundt, 2005), the strength of the group attachment would be a highly critical factor for productive creative process. Applying a closeness induction procedure to virtual creative teams and investigating whether this would benefit their creative processes and outcomes would be another interesting future research avenue.

### **Conclusions**

Current research contributes to the group creativity literature by identifying that perceived closeness between group members was an important factor that strengthens group creativity, while both perspective taking and a combination of perspective taking and was found to have a more negative effect on group creativity. I developed a collaborative story writing to assess group creativity, a task that can paint a more complete picture of what group creativity involves in real life settings, and I demonstrated its potential use for understanding joint creative outputs of groups. Overall, this research points to valuable future directions for researchers and for practitioners who are aiming to enhance collaborative creativity in groups.

Based on the present findings, leaders should consider setting up groups with members who feel close to each other to help them boost their creativity, especially in collaborations where creative writing is required. Forming groups with members who are not very close friends but rather have a moderate level of intimacy might be one way of doing this. A kick off meeting in the beginning of a project can help members to get to know each other. Given the increased importance of creative groups in work and

### Chapter 3 – Creativity in Connectedness

educational settings knowing how a sense of interpersonal connectedness affects a group's creative output has important implications for teamwork and the creative outputs of teams.

## **CHAPTER 4: DEVELOPMENT OF GROUP CREATIVITY: THE ROLE OF INTERSUBJECTIVITY AND INTRINSIC MOTIVATION**

During one of his lectures at Colombia University in the 1940s, the philosopher and educator John Dewey pointed out that “the world is moving at a tremendous rate; going no one knows where. We must prepare our children, not for the world of past, not for our world, but for their world - the world of the future.” (Kandel 1941, cited in Little, 2012, p.87). His inspiring words still resonate today. Key to dealing with continuous societal change are social and technological innovations (Andiliou & Murphy, 2010) and new sets of skills, such as creativity (Sawyer, 2006), collaborative knowledge construction, and team problem solving (Billett, 2006; Kirpal, 2004, cited in Hämäläinen & Vähäsantanen, 2011) . Emphasizing collaboration, collaborative problem solving and collaborative learning in educational settings is one step to be taken (Craft, 2008; Little, 2012) as such actions will facilitate team building, social development, and communication skills (Kagan, 1989).

Creativity is often defined as the generation of novel and useful ideas, solutions, or insights (Amabile, 1996, Runco, 2004). According to Amabile’s (1996) componential theory, individual creativity emerges from the intersection of three necessary components: domain relevant skills (i.e., technical, procedural and intellectual expertise in a domain), creativity relevant skills (e.g., cognitive flexibility, taking alternative perspectives, risk-taking, self-discipline, ambiguity tolerance), and intrinsic motivation. In the current study, I will apply Amabile’s (1996) componential theory to study developmental differences in group creativity between children and adolescents. Furthermore, I will investigate how skills relevant for group creativity and intrinsic motivation affect creative outputs of child and adolescent groups.

### **The Development of (Individual) Creativity**

Creativity, like other cognitive-developmental abilities, is expected to increase with age as older children have access to better search processes, have more social experience, and thus are expected to produce more solutions to creative problems compared to younger children (Mouchiroud & Lubart, 2002). Findings from individual creativity studies confirm an increase of creativity particularly between preschool/early elementary school and middle adolescence (Besancon & Lubart, 2008; Claxton, Pannells, & Rhoads, 2005; Lopez, Esquivel, & Houtz, 1993; Smith & Carlsson, 1983, 1985). However, Torrance (1968; see also Daugherty, 1993; Lubart & Lautrey, 1995; Urban, 1991) suggested that individual creativity starts decreasing from around age 6 until fourth grade (approximately age 9-10) and then increases again in (early) adolescence. This “fourth grade slump” might be due to increased conformity pressure that students experience in the first few years of school which makes them more anxious to display their full creative potential (Lau, Li, & Chu, 2004). However, all these studies investigated age differences in individual creativity. Since creativity is a dynamic, social, collective and collaborative process (Glavenau, 2010; 2011), there is a need for understanding how collaborative creativity progresses throughout development, a topic addressed in the current research.

### **Peer Collaboration and Group Creativity**

Peer collaboration involves a group of children working together on a task to produce shared meaning or solving a problem (Fawcett & Garton, 2005). Peer collaboration and group work are common and valuable practices in education that encourage active participation, learning to work collaboratively and hence prepare children for their transition to community (De Lisi & Golbeck, 1999). Research has explored peer collaboration through various constructs, such as the construction of knowledge, co-argumentation (Baker, 2002, cited in Hämäläinen & Vähäsantanen,

## Chapter 4 – Development of Group Creativity

2011), exploratory talk, a critical discussion technique which allows children pool ideas and information and challenge each other's suggestions to create new understanding (Mercer, 1996), coordination (Baron, 2000), group cognition (Stahl, 2006), shared meaning (Miell & Littleton, 2004; Miell & Littleton, 2008), collaborative reasoning (Anderson, Chinn, Waggoner & Nguyen 1998), and co-elaboration (Hamilton, 1997). The majority of empirical studies on peer collaboration focused on collaborative problem solving in the domains of science and mathematical reasoning, asking children to collaboratively solve problems on a structured task and arrive at a correct solution (MacDonald et al., 2000). Generally, this research shows that children working collaboratively obtain a higher performance and better outputs than children working individually (Samaha & De Lisi, 2000) in domains, such as learning (Rogoff, Turkonis, & Bartlett, 2001), moral reasoning (Kruger, 1992), and problem solving in academic and scientific topics (Azmitia & Montgomery, 1993; Phelps & Damon, 1989).

Only a few studies focused on peer collaboration in creative tasks such as joint music making or creative writing (e.g. Kleine-Staarman, Aarnoutse, & Verhoeven, 2003; Miell & Littleton, 2004; Miell & Littleton, 2008; Vass, Littleton, Miell & Jones, 2008; Vass, 2007; Rojas-Drummond et al., 2008). Vass (2004) observed collaborative writing sessions of children aged 8 and 9 over two school terms (10 friendship and 3 acquaintanceship dyads) and analysed the collaborative process through discourse analysis of paired talks. She found that paired talk of peers supports joint creative writing process and that different patterns of paired talk benefit different stages of writing. For instance, during the content generation stage, peers avoided explicit argumentation and shared their ideas in an uncritical manner. However, when evaluating the appropriateness of ideas, peers often used argumentation.

Macdonald, Miell and Mitchell (2002) investigated the effect of age and friendship on the quality of musical collaborations (evaluated by a teacher on aspects

## Chapter 4 – Development of Group Creativity

such as structure, originality and liveliness) in 40 girls aged either 8 or 11 years. For 11-year-old groups, being paired with a friend or non-friend made little difference to the quality of the performance. However, for 8-year-old groups, pairs of friends produced better-quality musical compositions than pairs of non-friends. The authors suggest that for younger children collaboration is a more demanding process than it is for older children. Hence, they can benefit more from collaboration when they have the advantage of working with their friends rather than non-friends (see also Hartup, 1996).

Understanding and exploring aspects of children's collaboration in creative domains is crucial as creative collaborations do not necessarily share the same factors as scientific collaborations. Unlike scientific areas, in creative tasks there is often no "correct solution" to the problem (Mac Donald et al., 2000). Thus, processes that might underlie peer collaboration and performance in scientific tasks (e.g., learning skills, insights into concepts) might not be important for peer collaboration on creative tasks. In this research I explored the processes that might affect the creative collaborations of children and adolescents on a verbal creativity task, collaborative story-writing. Previous studies on collaborative creativity in children indicate that the way group members talk and interact with each other affects the creative output of the group. Consequently, I assessed how group members' intersubjective exchanges and coordination, both cognitive and verbal, affected collaborative creativity in children and adolescents.

### **Peer Collaboration and Intersubjectivity**

Simply forming groups and working together is not enough to perform effectively as a group; the quality of the social interaction is crucial (Samaha & De Lisi, 2000). According to Rogoff (1990), active engagement in the group and reasoned dialogue helps the group to establish a shared reality which enables group members to produce ideas they would not have found by themselves. One key feature that

## Chapter 4 – Development of Group Creativity

facilitates the formation of shared reality is intersubjectivity, the shared understanding that results from exchanging different perspectives and ideas. As a broad concept, intersubjectivity has been investigated in joint attention and engagement, shared meaning making (Goncu, Patt & Kouba, 2002), and social coordination (Bateman & Fonagy, 2004, cited in Garte, 20015). Intersubjectivity in collaboration was found to be more prevalent in older than younger age groups. For instance, Gummerum, Leman and Hollins (2013, 2014) showed that 7-year-olds engaged in intersubjective interactions significantly less than 9-year-olds. Likewise, Leman (2015) found that 13-year-olds had more intersubjective interactions during collaborative work compared to 8-year-olds.

Whether intersubjectivity helps or hinders (the outcomes of) peer collaboration has received mixed results so far. On the one hand, Gummerum et al. (2013, 2014) found that intersubjectivity had detrimental effects on groups' productivity in a collaborative recall task. On the other hand, Garton, Harvey and Pratt (2003, cited in Fawcett & Garton, 2005) showed that the total number of joint utterances used during peer collaboration was a significant predictor of reasoning and problem solving. However, creativity tasks and collaborative processes do not require a single solution and thus rely on different demands and dynamics than collaborative-recall and problem-solving tasks. According to McDonald et al. (2000) joint engagement through dialogue might be particularly useful in creative tasks where partners are aiming to find novel ideas. Relatedly, Ligorio, Talamo and Pontecorvo (2005) found that Grade 5 (approximately age 10-11) students tried to consciously build intersubjectivity during a distance collaborative writing task. Thus, intersubjectivity, in the form of social perspective coordination and transactive dialogue, might positively affect the creative output of collaborating groups.

**Social Perspective Coordination.** As a cognitive manifestation of intersubjectivity, perspective taking helps children to coordinate with others (Miell &

## Chapter 4 – Development of Group Creativity

MacDonald, 2000), to be better communicators and problem solvers (Selman & Schultz, 1990). Social perspective coordination, a specific form of perspective taking, is defined as an individual's capacity to differentiate and integrate the perspective of the self with those of others (Selman et al., 1986). According to Selman et al. (1986), social perspective taking develops with age through five developmental levels: At Level 0 (egocentric; 3-5 years) children are unable to distinguish the perspectives of self and other; at Level 1 (one way; 6-7 years) children recognize others' perspectives but are unable to consider it simultaneously with their own perspective; at Level 2 (reciprocal; 7-8 years) children understand that each person has a unique perspective based on his/her values and reciprocally take into account perspectives of self and other; at Level 3 (mutual; 12-14 years) children can coordinate the perspectives of self and other and can see all perspectives from a general point of view; at Level 4 (interdependent; 15-18 years) children understand both personal and broader societal, cultural or global perspectives.

Perspective taking has been shown to be a key process in adult group creativity studies as it motivates members to be receptive to diverse perspectives which, in turn, can enhance group members' chances of developing novel and useful ideas (Hoever et al., 2012; Perry-Smith, 2006; Perry-Smith & Shally, 2003). Therefore, I propose that social perspective coordination will positively influence children's collaborative creativity. Specifically, groups formed of members with higher social perspective coordination skills are expected to produce more creative stories. Since social perspective coordination increases between childhood and adolescents, I also tested whether social perspective taking would mediate the relationship between age and group creativity.

**Transactive Communication.** Intersubjectivity can also be expressed in communication, specifically through transactive dialogue (Goncu, 1993), the

## Chapter 4 – Development of Group Creativity

"spontaneously produced critiques, refinements, extensions or significant paraphrasing of ideas" Kruger (1992, p. 169) between peers. Higher use of transactive dialogue is associated with successful collaborations, better learning in areas such as moral, mathematical and scientific reasoning, and problem solving (Kruger, 1992; Rogoff, 1990; Teasley & Roschelle, 1993, cited in MacDonald et al., 2000). Transactive communication is also important for creative musical collaborations of peers; higher level of transactive dialogues was found related to creation of better musical compositions (e.g. MacDonald et al., 2002; Miell & MacDonald, 2000). Following this research, this study investigated the role of transactive dialogue during the co-writing process. Using Kruger's (1992) framework of transactive communication, I expected groups with more transactive dialogues to produce more creative outputs compared to groups with less transactive dialogues.

### **Intrinsic Task Motivation**

As discussed before, motivation is a key part of individual creativity, and researchers have long argued that individuals with higher levels of intrinsic motivation are more creative. According to Amabile (1996), people are more creative when they approach a task with intrinsic (e.g., interest, enjoyment, satisfaction) rather than extrinsic motivation (e.g., reward, competition, evaluation) and that "it is task motivation that determines the extent to which domain-relevant skills and creativity relevant skills can be fully and appropriately engaged in the service of creative performance" (p. 133). Amabile specifies that when an intrinsically motivated person with high domain relevant and high creativity relevant skills works in a supportive social environment, creativity reaches its peak (see Conti, Coon & Amabile, 1996; Ruscio, Whitney, & Amabile, 1998).

Previous studies showed that intrinsic motivation directly affects individual and group creativity (Cooper & Jayatilaka, 2006; Hennessey & Amabile, 1998): It pushes

## Chapter 4 – Development of Group Creativity

individuals to be curious, to take more risks, and it also allows them to be cognitively flexible (Zhou & Shalley, 2003), all of which are expected to increase creativity. Amabile (1985) examined the effects of intrinsic and extrinsic motivation on the creative writing of graduate and undergraduate students. Participants first wrote a poem to establish their baseline creativity level. Then participants received a list of reasons for why they were writing, which contained either exclusively intrinsically motivated reasons (i.e., “You enjoy the opportunity for self-expression.”), exclusively extrinsically motivated reasons (i.e., “You want your writing teachers to be favourably impressed with your writing talent.), or participants received no list. After that, participants wrote a second poem. The externally-rated creativity of the first and second poem was not different for students who received intrinsically motivation reasons and students who received no list. However, students who received extrinsically motivated reasons obtained significantly lower creativity ratings on their second poem than those in the two other conditions.

Amabile, Hennessey and Grossman (1986) examined the effect of reward as an extrinsic motivator on the creativity of 5- and 10-year-old children. In a reward condition, participants were offered a Polaroid camera as a reward if they wrote a story later. In the no reward condition, children were allowed to use a Polaroid camera, but this was not offered as a reward. After children took photographs with the cameras, they were asked to tell a story by using the pictures they took. This storytelling task was either labelled as “work”, as “play”, or no label was given. While labelling did not affect the creativity of the story, children told more creative stories in the no reward condition.

So far, no study has explored whether the intrinsic motivation of group members also facilitates group creativity of children. Based on previous research with adults and children, I expected that group members with higher levels of intrinsic motivation

## Chapter 4 – Development of Group Creativity

would be more likely to look for divergent ideas and different perspectives. Thus, groups higher in intrinsic motivation are expected to have more creative outcomes.

### **Research Aims**

The current study investigated age differences in collaborative creativity between children and adolescents and the processes affecting collaborative creativity in these age groups. I expected that collaborative creativity would increase with age; in other words, adolescents should collaboratively produce better creative outputs than children (Hypothesis 1). Concerning the processes underlying collaborative creativity, I also hypothesized that intrinsic motivation would positively predict collaborative creativity; that is, groups composed of individuals with higher intrinsic motivation should produce more creative outputs (Hypothesis 2). Furthermore, social perspective coordination, as an indicator of intersubjectivity, was expected to increase collaborative creativity; groups composed of individuals with higher social perspective coordination should show more creative outputs (Hypothesis 3). Additionally, creative outputs should be positively associated with the amount of transactive dialogue as well as meta-communication between group members (Hypothesis 4). Also, I expected adolescents to exhibit higher levels of social perspective coordination and to engage in more transactive dialogue than children (Hypothesis 5). Finally, social perspective coordination was also expected to mediate the relation between age and group creativity (Hypothesis 6).

## Method

### **Participants**

The study involved 48 students from primary school years 5 and 6 ( $M_{\text{age}} = 10.42$  years,  $SD = .68$ , 24 females) and 45 students from secondary school years 9 and 10 ( $M_{\text{age}} = 14.71$  years,  $SD = .51$ , 23 females), who were assigned to 31 three-person

## Chapter 4 – Development of Group Creativity

groups. To control for possible gender effects in collaboration (see Leman et al., 2011) groups were single-sex composed of either all boys or all girls. Students were recruited from schools serving working and middle-class communities in South-West England. The majority of the pupils had a British background except for one student with a Central European and one with an Asian background.

### **Design and Procedure**

The study received ethical approval from the institute's Human Ethics Committee and only students who received parental consent took part.

Upon arrival, three participants were seated at a round table at equal distance from each other so they could see and hear each other clearly. Before the experiment started they were informed about the anonymity of the data and their right to withdraw. After assenting to take part in the study, all participants were instructed to the experimental task. All group interactions were video-taped.

The collaborative story writing, which was also used in Study 2 (Chapter 3), was used. Storytelling technique has proven to be a valid and practical way of assessing children's (individual) creativity in a short time frame, without any requirement for special materials (Hennessey & Amabile, 1988). In the current study, the story-telling task was modified slightly to make it more appropriate for evaluating group instead of individual creativity. Students were provided with nine story cubes (Rory's story cubes, see Figure 1) which were to assist them in creating the stories. Each face of the cubes contained a different image of a simple object (e.g., flower, ball, hat) which could be used as a cue to create the stories. Groups were told to roll the cubes and integrate the object depicted on the side of the cube lying face-up into their story. Groups were not given any rules and were free to use the cubes in the most convenient way. For example, some groups preferred to roll all nine cubes at the same time, while others took turns in rolling them. Before they started the task, all groups were instructed to

## Chapter 4 – Development of Group Creativity

write the most original story. They were also asked to structure their story with a beginning, middle, and end as well as to form at least one character in the story. Finally, they were also free to create a story in any genre.

All groups had 20 minutes in total to create the stories, including the time allocated to write the stories on the papers provided to them. The experimenter left the room during the experimental task and only came in to remind groups about the remaining time (when 10 and 2 minutes were left). Participants' collaborative story writing was video-recorded.

After creating and writing-up their stories, all participants were given questionnaires on social perspective coordination and intrinsic task motivation. At the end of the experiment, students were thanked, debriefed, given a small gift, and accompanied to their classroom. Gifts were chosen to be suitable for different age groups; younger age groups received a set of pencils and erasers, whereas older age groups received usb sticks in animal shapes.

### Measures

**Creativity Judgement.** Amabile (1982; 1996) proposed that defining an ultimate objective criterion for evaluating creative products would be impossible since this evaluation depends on the social context. She suggested that the most valid way of measuring the creativity of products would rely on the subjective assessment of experts in the particular domain, a method labeled “consensual assessment technique.” Briefly, in consensual assessment, experts rate the creativity of the product by using their own, subjective definition of criteria rather than using an established objective criterion.

Using this consensual assessment technique, I asked two primary schools and one secondary school English subject teachers to independently rate the creativity level of each story on the basis of their own, subjective definition of creativity. In order to mask the identities of students, digitally typed copies of stories were provided to the

## Chapter 4 – Development of Group Creativity

teachers. The only information teachers were given was the age and gender composition of groups. A rating guideline was prepared for teachers based on the evaluation criteria adapted from Hennessey and Amabile (1988), Alhusaini, Maker and Deil-Amen (2014), and Pople (2014). Teachers rated the stories on eight dimensions on a 10-point scale.

Dimensions were presented with short definitions: Creativity (“using your own subjective definition of creativity, please rate the degree to which the story is creative”); Imagination (“rate the degree to which subject/plot is imaginative”); Novelty (“rate the degree to which subject/plot is novel”); Liking (“using your own subjective criteria, how well do you like the story?”); Emotionality (“rate the amount and depth of emotion the story conveys.”); Voice (“rate the level of use of voice in the story, the sense of audience”); Characterization (“rate how well characters are written”) and Elaboration (“rate the level of elaboration of details in the story”). Teachers’ ratings of the 31 stories correlated highly ( $r_s = .61 - .86$ ) indicating a good level of inter-rater reliability.

Considering the high level of correlations between dimensions ( $r = .85-.95$ ), I conducted an exploratory factor analysis on the ratings of the eight dimensions using direct oblimin rotation. The Kaiser-Meyer-Olkin measure of sampling adequacy was .90, above the commonly recommended value of .6, and Bartlett’s test of sphericity was significant ( $\chi^2 (28) = 548, p = .000$ ). The analysis yielded a single factor solution with loadings between .93-.96 on a first factor, which explained 90% of the variance (eigenvalue= 1). Hence, all the dimensions of ratings were combined and averaged into one overall creativity score for each story.

**Demographics Questionnaire.** This questionnaire asked students to report their age, gender, year of education and whether they were bilingual.

**Social Perspective Coordination.** Social perspective coordination was measured with the subscales of the Relationship Questionnaire (REL-Q; Schultz et al., 2003), which consists of dilemmas and common social situations with peers and adults.

## Chapter 4 – Development of Group Creativity

Higher cumulative scores on this questionnaire indicate higher social perspective skills. The REL-Q is a multiple choice measure, administered to groups, and it is designed for fourth-grade through twelfth-grade students. It assesses the psychosocial maturity based on social perspective coordination and consists of 24 questions grouped in five subscales: understanding of interpersonal relationships (6 items), perspective-taking (4 items), hypothetical interpersonal negotiation (4 items), real-life interpersonal negotiation (4 items) and awareness of personal meaning (6 items). Items pose dilemmas or common situations, and there are four response options which represent the four theoretical levels of coordination of social perspectives: egocentric (level 0), unilateral (Level 1), reciprocal (Level 2), and mutual (Level 3). In the current study the focus was to understand the role of interpersonal skills in collaborative creativity including negotiation strategies and coordination of perspectives. Thus, I only used three of the subscales: perspective taking (interpersonal understanding), hypothetical interpersonal negotiation (hypothetical negotiation strategies needed to make and maintain good relationships), and real-life interpersonal negotiation (real-life negotiation strategies used to make and maintain good relationships). The following example presents a hypothetical negotiation about a conflict which is followed by four response options that the protagonist of the situation can take:

“Gladys, who has a ten o’clock curfew, goes to a party one Saturday night. She gets home at 12:00 and her father is waiting up for her. He is very angry and grounds her for a month. Gladys feels that the punishment is too severe and thinks she is old enough to stay out past 10:00. Gladys could

- a. Storm out of the room
- b. Tell her father he can’t tell her what to do
- c. Ask her father to work with her on an agreement, which would allow her to stay out later on weekends

- d. Explain to her father why she feels she's old enough to stay out late"

Students rated each of the four responses on a four point Likert scale (poor, OK, good, or excellent) and were then asked to choose the best of these four responses. In this way, each item received two different scores: A "response rating" score which is calculated by summing student's evaluations of the four responses and a "best choice" score which is based on the response which they choose as the best. Best choice scores were calculated for perspective taking, interpersonal negotiation and real-life interpersonal negotiation subscales by averaging the best choice scores for each item in the particular dimension. Likewise, a response rating score was computed for each subscale by averaging the scores of items of each domain. The overall best choice and response rating scores are calculated by averaging the best choice and response rating scores of three subscales (see Appendix 2). Overall, the scale had an acceptable level of reliability both for best choice score ( $\alpha = .60$ ) and for response rating score ( $\alpha = .80$ ). According to Schultz et al. (2003), since both response rating and best choice have similar developmental progression, a composite score can be calculated by averaging each. Considering the high correlation between best choice and response rating scores ( $r = .67, p < .001, n = 31$ ), a composite score was also computed by averaging them.

**Intrinsic Task Motivation.** Task motivation was measured with two subscales of the shorter version of the Intrinsic Motivation Inventory (IMI); interest/enjoyment and perceived competence. The choice was on the basis of our previous study where perceived competence was found as a significant mediator for adult group creativity. IMI is a multidimensional scale which is designed to measure intrinsic motivation and as well as its predictors in lab studies and can be modified for the specific activity (Ryan, 1982). The interest/enjoyment subscale is considered a self-report measure of intrinsic motivation, and perceived competence is theorized to be positive predictor of

## Chapter 4 – Development of Group Creativity

both self-report and behavioural measures of intrinsic motivation. I used an adaptation of the interest/enjoyment subscale, which was more suitable for children and adolescents (Van Djik, Lingnau & Kockelkorn, 2012). There were only minor changes in wording, and one reverse item framed positively but the essence of the items remained the same. Moreover, 7- point Likert scale was reduced to 5- point Likert scale with responses from “Strongly disagree” (1) to “Strongly agree” (5). Interest subscale consists of seven items (e.g., “I would describe the task as very enjoyable.”, “I would describe this activity as very interesting”). Perceived competence subscale consists of five items all of which are positively stated (e.g., “I think I am pretty good at this task”, “After working at this task for a while, I felt pretty competent”). Both interest and perceived competence subscales demonstrated a high level of reliability, ( $\alpha = .88$ ;  $\alpha = .83$ , respectively).

**Intersubjectivity in Conversations.** In order to explore group dynamics in collaborative creativity more extensively, group interactions were coded in terms of the meta-communication aspect of intersubjectivity (following Goncu, 1993; Gummerum et al., 2013). Meta-communication is defined as the communications between group members that initiate, maintain and terminate collaborative activities (Gummerum et al., 2013), such as invitations (e.g., “Let’s write now”), making plans for collaboration (e.g., “Should we roll the dices first?”), or ending a collaboration (e.g., “We don’t have much time left, let’s wrap up”). For each group, the frequency of these three meta-communication aspects was coded based on the groups’ conversations. Two of the videos from primary school groups were incomplete due to technical problems. Therefore, two independent coders watched and coded 29 videos in total. Inter-rater agreement level for 5 of the videos coded by two judges for three elements of intersubjectivity was good (invitations,  $\kappa = .60$ , making plans,  $\kappa = .70$ , end of collaboration,  $\kappa = .70$ ). Invitation frequency had a considerable correlation with making

plans ( $r = .31, n=30, p= .09$ ) and a significant correlation with end of collaborations ( $r = .65, n=30, p < .001$ ). The correlation between making plans and end of collaborations were also considerable ( $r = .33, n=30, p= .08$ ). Due to these correlations between the three aspects of meta-communication, they were all summed into one group meta-communication score.

**Transactive Communication.** Transactive communication was coded following Kruger (1992), Miell and MacDonald (2000) and Hewitt (2008). Transactive dialogues are defined as dialogues in which participants extend, elaborate an idea that has been developed by themselves or their partners (Miell & MacDonald, 2000). In order to be transactive, an interaction must move forward (through talk) specific ideas for the task (Kruger, 1992). Therefore, dialogues where peers work together but not take cooperative actions are not counted as transactive. Following previous research, transactive communications were those that indicated collaboration, while non-transactive communications were not seen as a sign of collaboration, and thus were not coded in the current study. Three aspects of transactive dialogue were coded: (1) Transactive statements, where the child offered a critique, extension, or elaboration of previously presented ideas, either raised by the child or others in the group (e.g., “We could add these cubes, too”); (2) transactive questions, where the child “spontaneously produced requests for justification, elaboration, or clarification” (Kruger, 1992, p. 196), related to own ideas or others’ ideas (e.g., “How can a spaceship be in the air without no one in it?”); and (3) transactive responses, where the child presents clarification, elaboration or justification for a transactive questions made either by themselves or group members (e.g., “Yes, we have already opened it and we can’t open another one.”). Two independent coders watched and coded 29 videos in total. Interrater agreement level for 5 of the videos coded by two judges for three elements of intersubjectivity was good (transactive statements,  $\kappa = .68$ , transactive questions,  $\kappa =$

## Chapter 4 – Development of Group Creativity

.73, transactive responses,  $\kappa = .63$ ). The frequency of each aspect of transactive dialogue was coded for each group. Transactive responses were significantly correlated with transactive statements ( $r = .67, n=30, p < .001$ ) and transactive questions ( $r = .53, n=30, p < .01$ ). Considering these high correlations, the three aspects of transactive dialogue were summed into one group score.

### Results

#### **Age-related Differences**

Independent samples t-tests were run to assess age differences between the younger and older age groups on the study variables (see Table 4.1). Adolescent groups' stories received significantly higher creativity ratings compared to primary-school groups. Similarly, compared to primary-school groups, groups of adolescents scored significantly higher on social perspective coordination. Intrinsic task motivation scores were significantly higher in the younger than the older age group. Moreover, the difference between younger and older groups' use of transactive dialogue was marginally significant with younger groups using more transactive communication. There was no significant difference between meta-communication of younger and older age groups.

#### **Correlations Between Study Variables**

Pearson product-moment correlations were computed to examine the relationships between the study variables; composite social perspective coordination scores, intrinsic task motivation, perceived competence, transactive communication, meta-communication and teachers' group creativity ratings. Table 4.2 indicates that group creativity ratings were positively correlated with social perspective coordination. Intrinsic task motivation was negatively correlated with group creativity with marginal significance while perceived competence had a significant negative correlation with.

Table 4.1.  
*Group Creativity, Social Perspective Coordination and Motivation Mean for Primary and Secondary School Groups*

	Primary			Secondary			Min-Max	t
	M	SD	N	M	SD	N		
Age	10.50	.52	16	14.73	.46	15	10.00-15.00	
Social perspective coordination	5.38	.37	16	5.99	.35	15	4.67-6.50	-4.70***
Group Creativity	4.39	1.44	16	7.01	1.21	15	2.38-8.79	-5.47***
Intrinsic task motivation	4.50	.63	16	3.87	.52	15	3.00-5.00	3.04**
Perceived competence	4.13	.72	16	3.40	.51	15	3.00-5.00	3.23**
Transactive Total Score	7.80	8.97	15	5.06	5.06	15	0-32.00	1.03
Transactive Statements	4.20	6.19	15	1.07	2.21	15	0-18.00	1.85 <sup>†</sup>
Transactive Questions	1.93	.167	15	2.87	2.36	15	0-17.00	-1.25
Transactive Responses	1.67	2.26	15	1.13	1.51	15	0-8.00	.76
Meta-communication total	18.87	13.56	15	19.87	8.10	15	6.00-58.00	-0.25
Invitations	3.00	5.77	15	2.93	4.86	15	6.00-26.00	.03
Plans	12.93	6.85	15	15.93	4.64	15	0-14.00	-1.41
End collaboration	2.93	3.67	15	1.00	1.07	15	0-11.00	1.96 <sup>†</sup>

Note. df=29, M= Mean, SD= Standart Deviation

\*\*\*,  $p < .001$ , \*\*,  $p < .01$ , \*,  $p < .05$ , <sup>†</sup>,  $p < .07$

group creativity. Transactive communication or meta-communication scores were not correlated with any of the variables. This is why no further analyses were conducted with these variables. Moreover, intrinsic task motivation and perceived competence were highly correlated; hence they were averaged into one composite score named intrinsic task motivation.

Table 4.2.

*Correlations among social perspective coordination, intrinsic task motivation perceived competence, transactive communication and meta-communication.*

	1	2	3	4	5	6
1-Group Creativity	1	.69**	-.32	-.36 *	-.11	.20
2-Social perspective coordination		1	-.15	-.14	-.12	.30
3-Intrinsic task motivation			1	.59 **	.13	-.03
4- Perceived competence				1	.03	-.09
5-Transactive communication					1	-.08
6-Meta-communication						1

Note. \*,  $p < .05$ , \*\*  $p < .01$ .

### **Group creativity, Social Perspective Coordination and Intrinsic Task Motivation**

A multiple linear regression analysis was conducted to investigate the effect of social perspective taking and intrinsic motivation on group creativity after controlling for the effects of age. Preliminary analyses were conducted to ensure there was no violation of the assumptions of normality, linearity, and homoscedasticity (Tabachnick & Fidell, 2007). A dummy variable was created for age groups entered in the first step. Social perspective coordination, and intrinsic task motivation were added at Step 2.

As shown in Table 4.3, at Step 1 the contribution of age was significant,  $F(1, 29) = 29.99, p < .001$  and accounted for 51% of the variance in group creativity. Groups from secondary school received significantly higher creativity ratings than groups from primary school. At Step 2, the total variance explained by the model as a whole was

Chapter 4 – Development of Group Creativity

60%, ( $F(2, 27) = 13.56, p < .001$ ). Social perspective coordination and intrinsic task motivation explained additional 9% of the variance in group creativity, and this change in  $R^2$  was marginally significant,  $F(2, 27) = 3.14, p = .06$  (see Table 3). The effect of age was controlled in step 2 and was no longer a significant predictor in step 2. Higher social perspective coordination was significantly predicting higher group creativity. However, intrinsic motivation was not a significant predictor of group creativity.

Table 4.3

*Summary of hierarchical regression analysis predicting group creativity from age, social perspective coordination and intrinsic task motivation*

	Step 1			Step 2		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
Age	2.63	.48	.71**	1.38	.75	.38
Social Perspective Coordination				1.69	.68	.43*
Intrinsic Task Motivation				-.31	.48	-.10

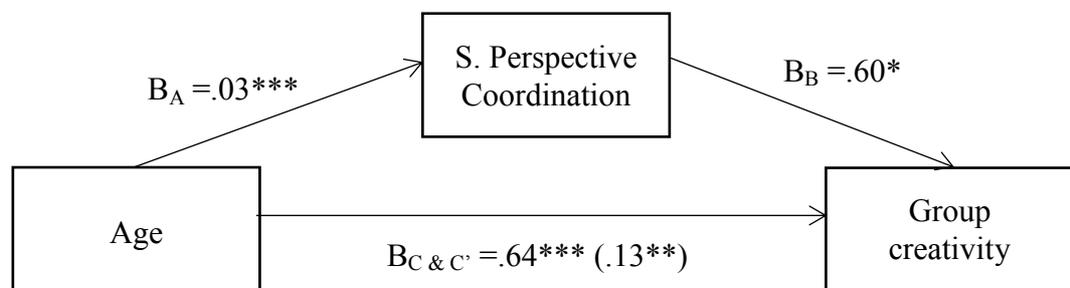
*Note.* *B* = Unstandardized coefficient,  $\beta$  = Standardized coefficient.

\*,  $p < .05$ , \*\*,  $p < .001$ .

Next, mediation analysis was conducted to examine whether social perspective coordination mediated the effect of age on group creativity ratings. The Preacher and Hayes bootstrap method (Preacher & Hayes, 2008) was used to test for mediation which allows for a powerful testing of single and multiple mediation hypotheses. Compared to the traditional causal step approach (Baron & Kenny, 1986), the bootstrapping method is less rigid as it does not assume normal distribution of the total and indirect effects and is more powerful to detect indirect effects. For this reason, bootstrapping can be applied more confidently to smaller samples. Based on 10,000 bootstraps it was found that the direct path from age to creativity, also called the total effect, was significant ( $B = .64, t(31) = 6.26, p < .001$ ). Age significantly predicted social perspective coordination ( $B$

## Chapter 4 – Development of Group Creativity

$=.03$ ,  $t(31)= 4.75$ ,  $p <.001$ ), and social perspective coordination significantly predicted group creativity ratings ( $B =.60$ ,  $t(31)= 2.21$ ,  $p=.04$ ). The direct effect of age on creativity, when controlled for social perspective coordination was still significant yet there was a decrease in the  $p$  value ( $B = .13$ ,  $t(31) = 3.54$ ,  $p=.001$ ). Finally, bootstrap result for the indirect effect of social perspective coordination between age and creativity was significant ( $B = .10$ ) with bias corrected 95% CI [.05, .47], an indicator for the existence of proposed mediation. Age was associated with .110 points higher group creativity as mediated by social perspective coordination (see Figure 4.2).



*Figure 4.1.* Results of Bootstrap Mediation Analysis for the indirect of age on group creativity (N = 31). Standardized regression coefficients are presented.

\*,  $p < .05$ , \*\*,  $p < .01$ , \*\*\*,  $p < .001$

### Discussion

Only a few studies have focused on peer collaboration in creative tasks such as joint music making or creative writing (e.g. Kleine-Staarman et al., 2003; Miell & Littleton, 2004; Miell & Littleton, 2008; Vass et al., 2008; Vass, 2007; Rojas-Drummond et al., 2008) and hence, what drives a successful peer collaboration in creative tasks is not well-understood. The present study aimed to contribute to our understanding of developmental differences in collaborative creativity within groups of children and adolescents working on a collaborative story writing task. Furthermore, the study aimed to examine potential underlying social-cognitive and motivation factors contributing to collaborative creativity in children and adolescents.

### **Developmental Differences in Group Creativity**

Based on previous research on the development of individual creativity (e.g. Besancon & Lubart, 2008; Claxton et al., 2005), I predicted that collaborative creativity would increase with age. The results of this study confirmed these expectations: The collaboratively created stories by adolescents were rated as significantly more creative than the stories produced by children. These findings are not only in line with previous research on the development of individual creativity (Besancon & Lubart, 2008; Chae, 2003; Claxton et al., 2005; Lopez, et al., 1993; Smith & Carlsson, 1983, 1985; Daugherty, 1993; Lubart & Lautrey, 1995; Urban, 1991) but also with studies showing that collaboration (on creative and non-creative tasks) might be more cognitively demanding and challenging for younger children (Azmitia & Perlmutter, 1989). However, this study not only assessed age differences in collaborative creativity, but also which developing psychological factors might underlie these differences. I focused on particularly two influences that have been shown to affect successful collaboration and creative outputs (e.g., Amabile, 1996; MacDonal et al., 2002), namely intersubjectivity and intrinsic motivation.

### **Intersubjectivity and Group Creativity**

Intersubjectivity, the shared understanding that results from exchanging different perspectives (Rogoff, 1990), was examined in two ways in the current study: As social perspective coordination, that is, a person's ability to differentiate and integrate perspectives (Selman et al., 1986), and as intersubjectivity in communication, namely transactive dialogue (Kruger, 1992) and metacommunication (e.g. Goncu, 1993). I expected that social perspective coordination would affect participants' collaborative creativity both directly and indirectly.

Indeed, the results suggest that more creative outcomes emerged among those groups whose members had higher levels of social perspective coordination. Advancing in psychosocial maturity (measured by developmental progression of perspective coordination) is a major determinant in how children and adolescents approach and understand others and how they integrate different perspectives (Schultz et al., 2003). As children learn to appreciate others' perspectives, they start building the capacity to coordinate them with their own perspectives. In time, they display more sophisticated interpersonal understanding towards others' thoughts, feelings, and motivations and hence, they become capable of moderating their relationships (Selman & Schultz, 1990). The role of perspective coordination has been used to understand peer relationships (Selman, Watts & Schultz, 1997), risk taking behaviour (Selman et al., 1992) and also children's writing (Dray, Selman & Schultz, 2009). The present study extended previous research by linking social perspective coordination to children's group creativity on a collaborative story writing task.

The current findings are also in line with previous research pointing to benefits of perspective taking for adults' group work (see Ku et al., 2015) and group creativity (Hoever et al., 2012). Results show that social perspective coordination skill, including social perspective taking, is influential in children's and adolescents' group creativity

too. There might be two reasons why social perspective taking helps collaborative creativity. First, good mind reading skills have been shown to be helpful in terms of cooperation (Paal & Bereczkei, 2007). Specifically, recognizing each group member's viewpoint facilitates a supportive environment within the group (Wolff et al., 2002) and this allows more room for the generation of novel ideas (Taggar, 2002). A second reason might be the contribution of social perspective taking to the domain of language and literacy. The creative story writing task requires creative thinking as well as language skills. Some researchers argued that perspective taking is essential in writing narratives as it requires understanding and persuading an audience about characters' actions, beliefs and mental states (Eaton, Collis & Lewis, 1999; Fox, 1991). For instance, Fox (1991) investigated the fictional narratives of children aged 9 to 13 and he showed that children demonstrated developmental progression of social cognition in their narratives. They were able to depict characters' inner worlds and expressive behaviours with an increasing sophistication. Dray et al., (2009) showed that the 10-year-old children's social perspective taking and the depth of social awareness conveyed in their narratives were positively associated. Moreover, children's level of social awareness (i.e., identifying and negotiating interpersonal relations) was also positively influencing the quality of their persuasive letters and narratives. Thus, as adolescents in the current study had more advanced social perspective taking coordination skills, they might have benefited from that in creative story writing.

Furthermore, social perspective coordination skills mediated the relation between age and group creativity. In other words, as children grow, they advance in coordinating perspectives in social relations and hence, groups combined of children with better perspective coordinating skills achieve more creative collaborations. These findings are in line with previous research showing that taking the perspective of others develops with age (Selman & Schultz, 1990) and it is a key aspect in effective social

## Chapter 4 – Development of Group Creativity

communication, such as persuasion (Clark & Delia, 1976). Young children first need to learn how to discuss and how to collaborate (Berkowitz & Gibbs, 1982) and social perspective coordination is a facilitator of that process. As children develop, they move from perceiving interactions as a collection of competing views to a perspective where only validity of knowledge matter (Leman & Duveen, 1996). Once children have become more attentive and inclusive towards others' ideas, there is more room to generate and share ideas in a group and a better chance to come up with novel solutions.

Unlike social perspective coordination, transactive dialogues and meta-communication were not associated with group creativity, in contrast to previous findings. For instance, Azmitia and Montgomery (1993) found a positive relation between group transactive statements during scientific problem-solving and children's individual scientific reasoning skills (measured after group work). Likewise, MacDonald et al., (2000) found that children's transactive statements while collaboratively composing a piece of music were positively related to the quality of the music composition. The current study was conducted in a different (creative) domain, namely creative writing, and it is possible that transactive dialogue and metacommunication affect successful collaborations differently in different domains. Han and Marvin (2002) investigated 7- to 8-year-old children's creative performances in three domains, storytelling, collage making and math word problems. The only positive association was between storytelling and math word-problem. However, the association was not very substantial and it was speculated to result from the fact that both tasks were verbal. The researchers concluded that there was domain specificity in children's creativity abilities across different domains instead of a general creativity level.

Moreover, surprisingly, primary school children were found to use more transactive statements than adolescents, unlike previous research. This finding could be

## Chapter 4 – Development of Group Creativity

due to age differences in children's attitudes towards group work. As Leman (2015) suggested, younger children perceive other group members as information sources, while older children begin appreciating the importance of group process and approach groups as units that require a cohesive dynamic rather than merely being sources of information. Thus, in the current study, younger children might have merely relied on group members as information sources and this is why they might have displayed more transactive communication during group work.

Furthermore, the relationship between group members could be another potential area affecting the use of transactive dialogue. In the current research, although children knew each other before most groups were composed of class mates rather than close friends, which might affect the frequency of transactive communication. Miell and MacDonald (2000) found that best collaborations occur between friends which are characterized by transactive talk. They concluded that: "Asking children with no history of relating to each other to work productively together will not be as likely to lead to high quality interactions, perhaps since there will be less transactive communication, at least in their initial work together." (p.365).

Finally, the nature of the collaborative task might have played a role. Writing a creative story means integrating the perspective of the writer with the perspective of the reader. According to Bruner (2002), a successful narrative is about maintaining continuity of characters, while keeping the reader interested with novelty. So, during the collaborative writing task, children have to find a good balance between the intersubjectivity between group members and the intersubjectivity needed for writing a good narrative (cited in Ligorio et al., 2005). The younger participants in this study might have struggled with finding that right balance and they might have channelled their intersubjectivity mostly towards story writing.

It should be noted, however, that the finding that some aspects of intersubjectivity are negatively related to the outcomes of group collaboration is not without precedent. Some authors (e.g. Gummerum et al., 2013, 2014; Leman, 2015; Leman & Oldham, 2005) found that increased intersubjectivity in children's interactions was associated with less optimal group collaborative outcomes. Intersubjective exchanges particularly negatively affected performance in tasks where group members had to state and integrate unique information in collaborative recall and group decision-making tasks. Providing and integrating novel information is, of course, also a feature of a collaborative creativity task. Thus, future research should investigate in which tasks intersubjective interactions help or hinder group collaboration; based on previous research we would suggest that intersubjective interactions might affect the sharing and integration of novel information negatively. Future research should also more thoroughly investigate when and why cognitive and stable aspects of intersubjectivity (i.e., social perspective coordination abilities) and situation-specific and communicative aspects of intersubjectivity (i.e., transactive dialogue, metacommunication affect the development of collaborative creativity).

### **Intrinsic Motivation and Group creativity**

The role of motivation in individual creativity received significant attention, and most researchers argued that higher levels of intrinsic motivation are an advantage for the individual creative process (see Amabile, 1996). Previous studies showed that intrinsic motivation directly affects individual and group creativity (Cooper & Jayatilaka, 2006; Hennessey & Amabile, 1998): It pushes individuals to be curious, to take more risks, and it also allows them to be cognitively flexible (Utman, 1997; Zhou & Shalley, 2003), all of which are expected to increase creativity. However, some researchers showed a weak or non-significant link between intrinsic motivation and creativity in different domains (Amabile et al., 1986; Dewett, 2007; Eisenberger &

## Chapter 4 – Development of Group Creativity

Aselage, 2009; Perry-Smith, 2006; Shalley & Perry-Smith, 2001). For instance, Amabile et al. (1986) asked elementary school children to individually make collages, write stories and solve puzzles. They found that self-reported intrinsic motivation was not significantly correlated with teacher-rated creativity of collages, stories or puzzles. Only children's choice to spend time on the task a week later correlated with the creativity of the stories, but not collages or puzzles.

The present study is the first one which has explored the role of group members' intrinsic motivation on the collaborative creativity of children and adolescents. Results showed overall intrinsic motivation score did not predict collaborative creativity. There can be several reasons for the lack of association. First, although Amabile and her colleagues emphasized the critical role of intrinsic motivation for creativity, they also acknowledged that extrinsic motivation can bring additional benefits (Amabile et al., 1996). In her theory of "motivational synergy", Amabile (1993) differentiates between two types of extrinsic motivation; synergistic extrinsic motivators (e.g., rewards, recognition, and receiving constructive feedback) and non-synergistic motivators (e.g., constraints, sense of being controlled, and deadlines). In the current study, students were told that their stories would be judged by experts and the best story would be chosen. Hence, rather than intrinsic task motivation, a synergistic extrinsic motivation (i.e., the drive to get recognition from judges and sense of competition) might have operated more prominently on group performance. Second, participants' ages spanned the early adolescence years, the onset of puberty which remarks a transition period associated with many social and emotional changes (Wigfield et al., 1991). Previous research pointed out that while students transfer from primary to secondary school, motivation in academic contexts declines (Anderman & Maehr, 1994). As children approach adolescence, in general, they start doubting their competence in school, question the value of academics, and start putting in less effort in school environment

## Chapter 4 – Development of Group Creativity

(Anderman & Maehr, 1994; Eccles & Midgley, 1989; Eccles et al., 1993). Thus, participants' motivation levels might have been on the decline considering their age span, which might have negatively affected their motivation towards collaborative story writing.

Theoretical and empirical research proposed that perceptions about skills and competence have a positive influence on motivation in educational settings (Bandura, 1997; Deci & Ryan, 1985; Eccles & Wigfield, 1995; Gottfried, 1990), and this association increased with age (Fredricks & Eccles, 2002; Wigfield et al., 1997). For instance, Fortier, Vallerand and Guay (1995) tested Ryan and Deci's self-determination motivation model with Grade 9 students and found that higher levels of academic competence were associated with higher levels of academic motivation. In the current study, both intrinsic motivation and perceived competence were negatively associated with group creativity. In light of the previous research, participants might have entered a stage of lower perceived competence, which might, in turn, have affected their task motivation. Competence level is particularly important for creativity. Beghetto, Kaufmann and Baxter (2011) explored the relation between primary school students' creative self-efficacy and teachers' ratings of students' creativity. While students' creative self-efficacy declined with age, teachers' ratings were not changing. I observed a similar trend in the present research as older children reported lower levels of task motivation and perceived competence.

### **Limitations**

While the present study revealed important indicative findings concerning the nature of collaborative creativity in children and adolescents, future research is needed both for replication and to overcome the several limitations of the current work. First, taking groups as units of analysis is a challenge for sample size and future research in this area should be based on larger group numbers. Second, due to time and space

## Chapter 4 – Development of Group Creativity

limitations of the hosting schools, I could only allow students to use twenty minutes for collaborative story writing task. Future research should target longer intervals of collaborations, which can display more about group dynamics of children. Furthermore, in order to maintain experimental control of subjective aspects of the research, I did not assist participants during story writing task. However, especially with younger children, scaffolding might be helpful to reveal their potential (Vygotsky, 1997). Moreover, teachers who rated the stories of students were provided with the information of groups' age and gender compositions, and this might have caused a certain level of bias in their judgements. Yet another limitation is that researching creativity by focusing on the creative outcome is not enough to grasp the complex nature of the concept. To be able to understand children's collaborative creativity potential more adequately, the entire group creativity process should be explored alongside the creative product. Finally, an ongoing debate in the field of creativity is teachers' approach to and evaluation of students' creative potential. Some researchers stated their concerns about teachers' incomplete understanding about creativity as well as their inaccurate judgements on characterizing creative students (Karwowski, 2010; Runco & Johnson, 2002). This is why researchers aiming to research on children's creativity should consider judges with different backgrounds, instead of relying solely on teachers' judgements.

### **Implications**

The findings of the current study has several implications in terms of children's collaboration, especially in educational settings. Simply assigning children to groups will not be sufficient to promote cooperation or productivity. In any creative collaboration, ages of children should be taken into account. Both the current study's findings and past research shows that younger children do not benefit as much from collaboration as older children or adolescents (Berkowitz & Gibbs, 1982). Creative collaborations between younger children might need extra attention of educators. Peer

## Chapter 4 – Development of Group Creativity

tutoring could be one effective strategy to boost group creativity activities of younger ones (Cohen, Kulik & Kulik, 1982). Children with different levels of skills can be encouraged to collaborate and teach others simultaneously. Peer tutoring is particularly beneficial for creative writing tasks as it eases the information processing demands of the writing process (Flower, 1989, cited in Yarrow & Topping, 2001). Moreover, the role of social perspective coordination skills in group creativity points to the necessity of training children in perspective taking. Educators can try to form groups of children with different perspectives, and they can direct children to form their view points in a way that they can also integrate others' thoughts, feelings and needs.

Another area that needs further attention is motivational aspects of children's creativity. Especially older students in the current research reported low levels of intrinsic task motivation as well as perceived competence. As mentioned above, children have a tendency to underestimate their creative skills and this can further influence their motivation towards creativity tasks. In that sense, facilitating children's creative self-efficacy would be helpful for boosting their task motivation as well as creative performances. Beghetto (2006) found that students' creative self-efficacy was positively associated with the feedback they receive from teachers with regards to their creative ability. It was also negatively associated with students' perceptions that their teachers did not listen to them or they gave up on them. Thus, more supportive teachers and inclusive classroom environments would help students reaching their actual creative potential. Moreover, complex and challenging tasks especially hinder sense of efficacy (Gist & Mitchell, 1992). This is why any supportive activity should be adapted to students' skill level.

### **Conclusions**

In conclusion, the results from the current work highlight several main points. First, there are age differences in terms of children's creative collaborations and groups

## Chapter 4 – Development of Group Creativity

formed of adolescents produced more creative outcomes compared to groups of children. Second one particular factor that explains age differences is the intersubjectivity level of group members in the form of the coordination of social perspectives. As social perspective coordination skills advance, groups become more successful in producing creative stories. Third, unlike research in individual creativity, intrinsic motivation had a weak and negative association with group creativity of children and adolescents. Further research is required to replicate these findings with different creativity tasks and larger samples. Moreover, experimental research is needed to understand under what conditions children's collaborative creativity can be facilitated.

## **CHAPTER 5: GROUP CREATIVITY DYNAMICS IN CHILDREN AND ADOLESCENTS**

Group creativity occurs through interactions of group members, and it is more than the sum of creativity of each individual. It is a multifaceted phenomenon which is shaped by characteristics of group members, group dynamics and processes, as well as the external context (Paulus et al., 2012). In the previous chapters I have reported on empirical studies that investigated the role of group member characteristics and group processes in children's, adolescents', and adults' group creativity. However, the external context in which the creative process is embedded also plays a major role in theories of both individual and group creativity (Amabile, 1996; Glaveanu, 2010, 2015). That is, social, cultural, and historical contexts influence (definitions of) creativity in different domains. While I investigated potential differences in creative optimal group performances (i.e., social flow) for different creative domains (dance, musical theatre, and orchestra) in Chapter 2, I have not assessed how culture affects the group creativity of children and adolescents and the underlying (group) processes identified in my previous empirical studies. The role of this study is to address this lacuna.

### **Culture and (group) creativity**

One of the controversies in the creativity literature concerns whether or not creativity has a universal definition (Plucker, 1998). Some researchers argue that there are cross-cultural differences in understanding of creativity (Lubart & Sternberg, 1998; Niu & Sternberg, 2001, 2002), while others propose that creativity is perceived similarly across cultures (Guilford, 1975; Plucker, 1998). For instance, a study on the definition of creativity in Turkey showed that, unlike the case with Western countries, creativity was not only associated with originality but also with practicality and usefulness. Furthermore, Turkish participants perceived entrepreneurs and inventors as creative personalities, similar to musicians and painters (Arik & Oztop, 2016).

## Chapter 5 – Group Creativity Dynamics

Empirical studies with creativity tasks also confirmed that culture may play a role in the expression of creativity. Goncalo and Stew (2006) analysed the effects of cultural orientation (individualism and collectivism) and task instructions (coming up with either creative or practical solutions) on the group creativity of adults. They did not find a main effect of cultural orientation; however, they found a significant interaction between cultural orientation and task instructions. Groups with an individualistic orientation produced more creative results than groups with a collectivistic orientation only when they were instructed to produce creative solutions. Bechtoldt and colleagues (2010) explored group creativity in both Dutch and Korean samples. They manipulated creativity norms by priming either originality or appropriateness and found that Dutch groups (a more individualistic culture) valued the originality aspect of creativity more than they valued the appropriateness aspect whereas Korean groups (a more collectivist culture) did the reverse. Such cross-cultural differences might also apply to children from different cultures; that is, children in collectivist cultures and children in individualistic cultures might display different profiles of collaborative creativity, a question that has not been explored so far.

The study reported in Chapter 4 was conducted in England, an individualistic culture where independence of self is more dominant over interdependence between self and the others (Markus & Kitayama, 1991). Considering the findings on the role of culture on creativity, it is reasonable to assume that children's and adolescents' group creativity might be different in a non-individualistic culture. Turkish culture displays characteristics of both individualism and collectivism (Goregenli, 1997). This co-existence of individualistic and collectivistic attributes has also been demonstrated in children's behaviour and evaluations. Ozdikmenli and Sayil (2009) examined fifth, eight and tenth grade students' and their mothers' individualistic-collectivistic tendencies with hypothetical scenarios depicting interpersonal conflict situations.

## Chapter 5 – Group Creativity Dynamics

Although younger children were more collectivistic in their responses compared with adolescents and their mothers, individualistic conceptualizations increased with age from 11 to 16. However, whether the situation took place in school or home context created dramatic variations in responses of older age students. Thus, there are differences between individualism-collectivism profiles of Turkey and England and these differences might also be reflected in the creative collaborations of children and adolescents and the processes underlying collaborative creativity. A first goal of the current investigation was to replicate the study reported in Chapter 4 in a Turkish context.

### **Culture and Social Perspective Coordination**

In Study 4, I found that among English children and adolescents social perspective coordination affected group creativity both directly and indirectly: Groups with members higher in social perspective taking produced more creative stories. Furthermore, social perspectives mediated the relationship between age and group creativity. Here, I was interested in whether culture would influence age differences in social perspective taking and whether this, in turn, would affect age differences in group creativity.

Previous research has shown cultural differences in the ability to understand others' minds. Studies on theory of mind and false-belief understanding with preschool children suggested a clear difference between eastern and western cultures; children from Western countries performed better than children from Asian countries (see Hughes & Devine, 2015 for a review). However, this difference between Eastern and Western children was smaller in older children (Evans, Xu, & Lee, 2011), and mind-reading differences might even reverse in adulthood (Hughes & Divine, 2015). Wu and Keysar (2007) compared visual perspective taking cross-culturally and found that American adults (i.e., living in an individualistic culture) were less skilful in taking

another's visual perspective compared to Chinese adults (i.e., living in a more collectivist culture). This might be because individuals from more collectivist cultures valued interdependence between self and the other more over independence of the self, focused on others' perspectives, and thus, avoided egocentric perspective-taking. Conversely, people living in an individualist culture valued independence of the self over interdependence, put greater emphasize on their own perspective and consequently, were more egocentric in perspective-taking (Wu & Keysar, 2007). Based on these findings, we might therefore assume that older children in Turkish context might be mastering perspective taking coordination well. If they are already skilful, this might imply that perspective taking coordination would be less critical for group creativity as it is for an individualistic culture, such as England.

### **Culture and intrinsic motivation**

There is a well-established positive relationship between intrinsic motivation and individual creativity (Amabile, 1985; Amabile et al., 1986; Ruscio, Whitney & Amabile, 1998), and this link has also been found across cultures. For example, Oral, Kaufman and Agars (2007) showed that intrinsic motivation was a significant predictor of individual creativity in a Turkish sample. However, the role of intrinsic motivation in group creativity has not been investigated with Turkish participants, and, what is more, there is no research about the role of culture on the link between intrinsic motivation and group creativity. In the study reported in Chapter 4, the relation between task motivation and group creativity was weak and negative, in contrast to findings from individual creativity studies. In the current study, the role of intrinsic motivation (towards the task) in group creativity was explored with Turkish children and adolescents to attempt to replicate the unexpected findings of the study conducted with British children and adolescents.

### **Cohesion and Group Creativity**

As discussed above, one main aim of the current study was to replicate my investigation on age differences in group creativity and its underlying processes in a non-European sample. Thus, the control condition in the current study replicated the experimental design of the empirical study reported in Chapter 4. In addition, I was interested in the effect of another group process variable, cohesion, on children's and adolescents' group creativity. In Chapter 3, I demonstrated the positive influence of interpersonal closeness on group creativity of adults as well as the negative influence of the combination of closeness and perspective taking (which was speculated to be similar to the groupthink concept). In the current research, I aimed to explore task cohesion in children's group creativity.

Adult studies showed that quality of group creativity is directly influenced by group dynamics such as group cohesion (Woodman et al., 1993). As mentioned in Chapter 3, strong group cohesion is believed to result in better group performance (Hulsheger et al., 2009; Mullen & Copper, 1994). However, cohesion can also have undesirable effects and might even decrease group creativity (Jaussi & Dionne, 2003). Due to its multidimensional nature, different aspects of cohesion have differential effects for group productivity. Bernthal and Insko (1993) found that the combination of low social-emotional (i.e., interpersonal) cohesion and high task cohesion resulted in the lowest level of groupthink perceptions. They concluded that task cohesion brings an analytical focus on the decision making processes of the group and does not create a collective uncritical thinking tendency which is characteristic of groupthink. As a consequence, the current study attempted to experimentally manipulate the level of task cohesion in creative groups.

Children's understanding of groups and group dynamics changes throughout development. Younger children perceive groups along basic ingroup-outgroup

## Chapter 5 – Group Creativity Dynamics

distinctions (e.g., us versus them). However, from 8 years onwards, children develop a more complex perception of (ingroup and outgroup) group dynamics, and they start to benefit from group cohesion (Abrams, Rutland, Cameron & Ferrell, 2007). Leman (2015) examined how group dynamics influenced children's (8 years) and adolescents' (13 years) performance on a collaborative quiz. Cohesion manipulations instructed participants to work as a group, and they were told that collaborating would be beneficial to reach the best scores. He found that groups of different ages benefited from collaboration under different conditions. Children benefited when they used their groups as sources of information but did not benefit from task group cohesion. However, adolescents perceived groups as collective units where there is need of coordinated action, and they benefited more from cohesive groups rather than from groups that were mere sources of information. So far, it remains unclear how task cohesion affects the collaborative creativity of children and whether the potential influence of task cohesion changes with age. Thus, in the current research the role of cohesion in the group creativity of children and adolescents was investigated.

### **Research Aims**

The current study was conducted in Turkey to explore if there are any cross-cultural differences between collaborative creativity practices of children and adolescents from Turkey and England. One condition of the current study was a replication of the investigation reported in Chapter 4. Similar to that study, I used a collaborative creative writing task and the consensual assessment technique to measure group creativity. However, following the consensual assessment technique meant that the raters of the stories were Turkish teachers and experts. As such, they might use their own culturally-dependent definitions of creativity and creative stories which might not correspond exactly to the criteria used by the English raters. Thus, the current study is not directly comparable to the results reported in Chapter 4, but can nevertheless give

## Chapter 5 – Group Creativity Dynamics

insights into potential cross-cultural similarities and differences in the development of group creativity and its underlying processes.

Similar to the study reported in Chapter 4, the current investigation assessed age differences in collaborative creativity between children and adolescents from Turkey. I expected to replicate the previous chapter's findings: Collaborative creativity should increase with age; in other words, adolescents should collaboratively produce better creative outputs than children (Hypothesis 1). Concerning the processes underlying collaborative creativity, I also explored how social perspective coordination skills of Turkish children and adolescents would influence their group creativity outcomes (Research Aim 1), whether the effect of age on group creativity was mediated by social perspective coordination skills (Research Aim 2) and how intrinsic task motivation would be related to group creativity in the Turkish sample (Research Aim 3). Finally, I manipulated task cohesiveness in an additional experimental condition. I expected that cohesion would positively influence collaborative creativity, namely that cohesive groups would produce better creative outputs than non-cohesive ones (Hypothesis 2). Following Leman (2015), this positive effect of task cohesion should be more pronounced among adolescent than children groups (Hypothesis 3)

### Method

#### **Participants**

The study involved 79 students from years 5 and 6 ( $M_{\text{age}} = 10.24$  years,  $SD = .79$ , 39 females) and 80 students from year 8 ( $M_{\text{age}} = 14.00$  years,  $SD = .66$ , 42 females), who were assigned to 53 three-person groups. In order to control for possible gender effects in collaboration (see Leman et al., 2011), groups were composed as either all-boys or all-girls. Students were recruited from a secondary school of working and middle class families in Istanbul, Turkey.

### **Design and Procedure**

The study received ethical approval from the university's Human Ethics Committee and only students who received parental consent took part. Groups were randomly assigned to two experimental conditions, cohesion ( $n=26$ ) and control ( $n=27$ ). Cohesion was manipulated experimentally.

Upon arrival, three participants were seated at a round table at equal distance from each other so they could see and hear each other clearly. Before the experiment started they were informed about the anonymity of the data and right to withdraw. Groups in the cohesion condition received the cohesion (experimental) manipulation. The procedure for the groups in the control condition was identical to Study 3 (see Chapter 4). All group interactions were video-taped.

**Experimental manipulation.** The task cohesion manipulation was partly adapted from previous research (Craig & Kelly, 1999; Zaccaro & McCoy, 1988). After being informed about the experiment, groups in the cohesion condition received a brief presentation that emphasized the growing importance of team work. The presentation started with the hypothetical case of two teachers who would teach the two main theories about the extinction of dinosaurs. According to the scenario, one teacher adopts the traditional approach and teaches the details of the two theories in the classroom. The other teacher only teaches the main points of the theories briefly. Then, she assigns students into groups and asks them to research about the theory they favored, as a group, and to give a group presentation at the next class. Afterwards, the subject is assessed by a quiz. At this point, the experimenter asked students to guess which of these teachers' students would be more successful on the quiz. Once all individuals in the group stated their opinions, the experimenter told them that because learning by group work is more effective than learning by listening, students of the second teacher were more successful on the quiz. Then, the experimenter continued with the

## Chapter 5 – Group Creativity Dynamics

presentation. Groups were first informed about the growing importance of group work. Then, students were provided examples of successful culturally-relevant team work, such as artistic group performances taking place in their schools, successful sports teams (e.g., football teams, Formula One teams), and superhero groups from famous comics and movies . Afterwards, members of the group were asked to think about the positive group work experiences that they had had before. Specifically, they were asked to think and share their experiences about what helped their groups to work together. While the students shared these experiences with their group members, the experimenter left the room briefly. Once the experimenter came back, she instructed students to try to apply those positive aspects of group work to their current collaboration and to make group decisions during the task. The groups in the cohesion condition were also informed that their stories would be judged by raters and that the group that produced the “the most original” story would be awarded with a game. Groups in the control condition received the same instructions as groups in Study 3.

Groups in both conditions received the same creativity task as groups in Study 3. All groups had 20 minutes in total to create the stories, including the time allocated to write the stories on the papers provided to them. The experimenter stayed outside the room during the task and only came in to remind groups when they had 10 and 2 min left.

After creating and writing up their stories, all participants were given questionnaires on social perspective coordination, intrinsic task motivation, interpersonal cohesion and task cohesion. At the end of the experiment, students were thanked, debriefed, given a small gift, and accompanied to their classroom. Students in the cohesion condition wrote down their names so that, if they were to win, the award could be given to them.

## Measures

**Creativity Judgement.** The creativity of the stories was evaluated with the consensual assessment technique, similar to previous studies. Three secondary-school Turkish subject teachers were asked to rate the creativity level of each story on the basis of their own, subjective definition of creativity. The rating procedure was as same as in Study 3 (Chapter 4); teachers received the digital typed copies of stories with only the information of age and gender composition of groups provided. Likewise, the same criteria as those in Study 3 were adopted. Thus, teachers independently rated the stories on a 10-point scale on eight dimensions; Creativity, Novelty, Liking, Emotionality, Voice, Characterization and Elaboration.

Teachers' ratings of the 53 stories correlated highly ( $r_s = .61 - .84$ ) indicating a good level of inter-rater reliability. Considering the high level of correlations between dimensions ( $r = .85-.95$ ), we conducted an exploratory factor analysis on the ratings of the eight dimensions using direct oblimin rotation. The Kaiser-Meyer-Olkin measure of sampling adequacy was .90, above the commonly recommended value of .6, and Bartlett's test of sphericity was significant ( $\chi^2(36) = 655, p = .000$ ). The analysis yielded a single factor solution with loadings between .90-.95 on a first factor, which explained 90% of the variance (eigenvalue > 1). Hence, all the dimensions of ratings were combined and averaged into one overall creativity score for each story.

**Demographics questionnaire.** This questionnaire asked students to report their age, gender, year of education and whether they were bilingual.

**Social perspective coordination.** Social perspective coordination was measured with a Relationship Questionnaire (Schultz et al., 2003). Following Brislin's (1980) suggestions, the scale was first translated into Turkish, and then two bilingual researchers (specializing in the field of developmental psychology) translated the scale back from Turkish to English. As was the case in Study 3, three of the subscales,

perspective taking, hypothetical interpersonal negotiation, real-life interpersonal negotiation were used (see Appendix 2). Overall the scale had an acceptable level of reliability both for best choice score,  $\alpha = .50$  and for response rating score,  $\alpha = .60$ . Best choice score and response rating score were not correlated and hence they were not combined into one composite score (see Table 5.2).

**Intrinsic Task Motivation.** Intrinsic task motivation and perceived competence were measured by the same subscales as in Study 4 (IMI, Van Djik, Lingnau & Kockelkorn, 2012). Similar to the procedure applied for the REL-Q, the scale was first translated into Turkish and then back-translated into English by the same two bilingual researchers (Brislin, 1980). The scale had very high reliability,  $\alpha = .90$ .

**Interpersonal cohesion.** Cohesion is known to be a multidimensional construct (Mullen & Copper, 1994) and different types of cohesion have different effects on the performance of groups (Craig & Kelly, 1999). In the current study, I focused on and manipulated task cohesion. However, I also measured interpersonal cohesiveness (interpersonal attraction between group members) in order to control for its potential effect on group creativity. Students were asked to rate their group members on two sociometric rating scales: “work with” and “play with” (Leman, 2015). Specifically they were asked: “How much would you like the play with your group friends” and “How much would you like to work with your group friends.” Students responded to items on a 5-point Likert type scale ranging from “Not at all (I would not like to work/play with my group friend)” to “Very much (I would like to work/play with my group friend). Students indicated their preferences for their two group friends and the responses were averaged into one score. Then, a group score was computed by averaging the responses of group members. The scale displayed acceptable reliability level,  $\alpha = .60$ .

**Task cohesion.** Task cohesiveness was adapted from the five item scale developed by Craig and Kelly (1999). The scale was (back) translated into Turkish

following the procedure of Brislin (1980). Group members were asked: “How much was your group engaged in the task”, “How much did your group enjoy the task”, “How important was it for the group to do well on the task”, “How meaningful was the task for the group”, and “Did you believe it was beneficial to work as a group”.

Additionally, participants were asked whether they would like to change groups if they took part in a similar activity in the future (see Leman, 2015). Responses were given on a 5-point Likert scale from “Strongly disagree” (1) to “Strongly agree” (5). The scale displayed good level of reliability,  $\alpha = .71$ .

An exploratory factor analysis was conducted on the six items (items of task cohesion scale and the single item about changing groups) using direct oblimin rotation. The Kaiser-Meyer-Olkin measure of sampling adequacy was .80, above the common threshold of .6, and Bartlett’s test of sphericity was significant ( $\chi^2(15) = 164, p = .000$ ), indicating availability for factor analysis. The analysis yielded a single factor solution with loadings between .62-.76 on a single factor, which explained 43 % of the variance (eigenvalue= 1). Hence, scores on the six items were averaged into one overall task cohesiveness score for each individual.

## Results

### **Manipulation checks**

An independent samples t-test was conducted to test for differences in interpersonal cohesion between the two experimental conditions. The results displayed a significant difference between two conditions,  $t(51) = 2.36, p = .02$ . Groups in the cohesion condition ( $M = 4.65, SD = .49$ ) reported higher interpersonal cohesion levels compared to groups in control condition ( $M = 4.30, SD = .61$ ). In order to distinguish task cohesion’s effect, interpersonal cohesion was used as a covariate in a one-way Analysis of Covariance (ANCOVA). The effect of cohesion manipulation on task cohesion was significant after controlling for interpersonal cohesion,  $F(1, 50) = 26.42, p < .001$ .

## Chapter 5 – Group Creativity Dynamics

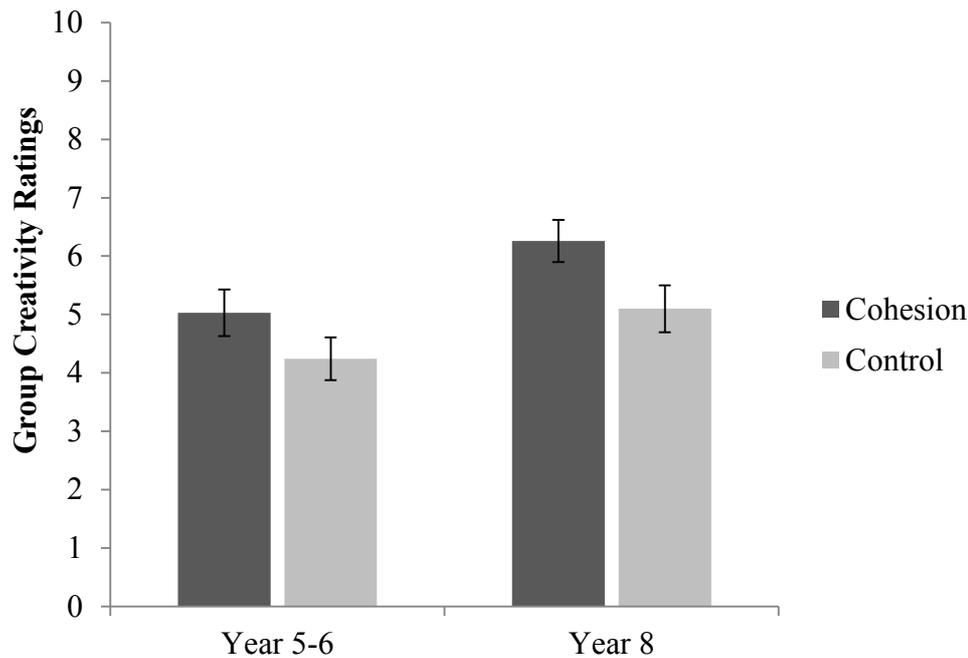
Groups in the cohesion condition displayed higher task cohesion ( $M= 4.73, SD=.45$ ) than groups in the control condition ( $M= 4.04, SD=.44$ ). The results indicated a successful manipulation of group task cohesion.

### **Age differences**

Independent sample t-tests were conducted to assess age differences in group creativity ratings, social perspective coordination, and intrinsic task motivation (see Table 5.1). Groups of adolescents received significantly higher group creativity ratings compared to younger groups. There was no age difference in social perspective coordination. Intrinsic task motivation scores of younger groups were significantly higher than those of older group. Finally, interpersonal and task cohesion scores did not display any age group difference.

### **Creativity of groups**

A 2x2 ANOVA with age group (Year 5-6, Year 8) and cohesion manipulation (cohesion, control) as independent variables and group creativity groups as dependent variable yielded a significant main effect of age,  $F(1, 49) = 6.47, p = .01, \eta^2 = .12$ , and a significant main effect for cohesion  $F(1, 49) = 7.43, p = .01, \eta^2 = .13$ . However, the Interaction between age and cohesion was not significant  $F(1, 49) = .44, p = .64, \eta^2 = .01$ . Older age groups received a higher creativity score for their stories than younger age groups. Across ages, groups that received the cohesion manipulation received a higher creativity score for their stories than groups who did not receive the manipulation (see Figure 5.1)



*Figure 5.1.* Group creativity ratings according to age group and experimental condition. Errors bars represent standard errors.

**Correlations between variables**

Pearson product-moment correlations were computed to examine the relationships between social perspective coordination scores (best choice, response rating and composite scores), intrinsic task motivation, perceived competence and group creativity ratings. Table 5.2 indicates that group creativity was positively correlated with the social perspective coordination both the best choice and composite scores. However, group creativity was not correlated with the response rating scores. Moreover, there were significant negative correlations between task motivation, perceived competence and group creativity. Finally, the correlation between social perspective coordination best choice scores and response rating scores was not significant. Therefore, both social perspective coordination scores, best choice and response rate, were included in the next analyses. Finally, intrinsic task motivation and perceived competence were correlated; hence they were averaged into one composite score named intrinsic task motivation.

Table 5.1

*Age, group creativity, social perspective coordination, cohesion and motivation means for younger and older age groups*

	Year 5-6 (N=26)		Year 8 (N=27)		Min-Max	t
	M	SD	M	SD		
Age	10.20	.75	14.00	.47	9.00-15.00	
S. Perspective Coordination						
best response	2.64	.28	2.59	.36	2.00-3.00	.54
response rating	9.04	.32	9.17	.37	8.33-10.33	-1.41
composite	5.84	.21	5.88	.31	4.67-6.50	-.59
Group Creativity	4.64	1.42	5.66	1.51	1.92-8.75	-2.55*
Intrinsic task motivation	4.50	.35	4.06	.32	3.50-5.00	4.85**
Perceived competence	4.21	.49	3.89	.42	3.00-5.00	2.41*
Overall Motivation	4.81	.40	4.22	.42	3.50-5.00	5.16***
Interpersonal cohesion	4.42	.64	4.52	.51	3.00-5.00	-.60
Task cohesion	4.46	.58	4.30	.54	3.00-5.00	1.07

*Note.* df=29, M= Mean, SD= Standart Deviation

\*\*\*,  $p < .001$ , \*\*,  $p < .01$ , \*,  $p < .05$

Table 5.2

*Correlations among social perspective coordination, intrinsic task motivation, perceived competence and creativity ratings (N=53)*

	1	2	3	4	5	6
1-Group Creativity	1	.28*	.20	.30 *	-.26 *	-.36 **
2-Social perspective coordination (best choice)		1	.24	.77 **	.12	-.03
3-Social perspective coordination (response rate)			1	.81 ***	.05	-.25
4-Social perspective coordination (composite)				1	.11	-.19
5-Intrinsic task motivation					1	.32 *
6-Perceived Competence						1

Note. \*\*\*  $p < .001$ , \*\*  $p < .01$ , \*  $p < .05$

In the next step, the relationships between group creativity ratings, age, social coordination skills (best choice and response rate scores) and intrinsic task motivation were explored with regression analyses. Since social perspective coordination response rating score and best choice response score were not correlated, they were both included in the next analyses.

### **Group creativity, social perspective coordination and intrinsic task motivation**

A hierarchical multiple regression analysis was conducted to investigate whether social perspective coordination and intrinsic task motivation predicted group creativity ratings after controlling for the effects of age. Preliminary analyses were conducted to ensure there was no violation of the assumptions of normality, linearity, and homoscedasticity (Tabachnick & Fidell, 2007). A dummy variable was created for age and it was entered in the first step in order to control for its effect. Social perspective coordination best choice and response rating scores were not correlated with each other; hence they were both entered in the second step together with intrinsic task motivation. The order of the variables seemed plausible for the predictions of the study.

## Chapter 5 – Group Creativity Dynamics

As shown in Table 5.3, at Step 1, the contribution of age was significant,  $F(1, 51) = 6.52, p = .014$  and accounted for 11 % of the variance in group creativity. Adolescent groups received higher group creativity scores than child groups. After entering the best choice, response rating scores, and intrinsic task motivation at Step 2, the total variance explained by the model as a whole was 27 % ,  $F(3, 48) = 3.44, p = .004$ . The additional variables explained additional 16 % of the variance in group creativity and this change in  $R^2$  was significant,  $F(3, 48) = 3.44, p = .02$  (see Table 5.3). Thus, according to this model, when the effect of age was controlled, social perspective coordination best choice scores were the strongest predictors of group creativity performance. Intrinsic task motivation was a weaker predictor, which predicted group creativity with marginal significance. Age was no longer a significant predictor at Step 2.

Table 5.3

*Summary of hierarchical regression analysis predicting group creativity from age, social perspective coordination and intrinsic task motivation*

	Step 1			Step 2		
	<i>B</i>	<i>SE B</i>	$\beta$	<i>B</i>	<i>SE B</i>	$\beta$
Age	1.03	.40	.34**	.57	.46	.19
S. perspective (best choice)				1.44	.61	.30**
S. perspective (response rating)				.23	.57	.05
Intrinsic task motivation				-1.12	.58	-.29*

*Note.* *B* = Unstandardized coefficient,  $\beta$  = Standardized coefficient.

\*,  $p < .06$ , \*\*,  $p < .05$ .

Next, mediation analysis was conducted to examine whether social perspective coordination (i.e., best choice score) mediated the effect of age on group creativity ratings. The Preacher and Hayes bootstrap method (Preacher & Hayes, 2008) was used to test for mediation. Based on 10.000 bootstraps it was found that the direct path from age to creativity, also called the total effect, was significant ( $B = .25, t(53) = 2.39, p = .02$ )

## Chapter 5 – Group Creativity Dynamics

,age did not predict social perspective coordination ( $B = -.20$ ,  $t(53) = -.74$ ,  $p = .50$ ), and social perspective coordination significantly predicted group creativity ratings ( $B = 1.52$ ,  $t(53) = 2.52$ ,  $p = .02$ ). The direct effect of age on creativity, when controlled for social perspective coordination was also significant ( $B = .27$ ,  $t(53) = 2.76$ ,  $p = .01$ ). However, bootstrap result for the indirect effect of perceived competence between age and creativity was not significant ( $B = -.02$ ) with bias corrected 95% CI  $[-.11, .03]$ , an indicator for the non-existence of proposed mediation. These findings showed that social perspective taking was not mediating the effect of age on group creativity

### Discussion

The current study had two general aims: First, to replicate the findings regarding developmental differences in group creativity and potential underlying group processes in a non-western sample; second to assess the role of group cohesion for group creativity in a developmental context.

#### **Group Creativity in Turkish Children and Adolescents**

Similar to the study reported in Chapter 4, I found developmental differences in group creativity: The stories produced by adolescent groups were rated as more creative than those by children. Thus, despite potential cross-cultural differences in (the definition of) creativity (Arik & Oztop, 2016), the developmental patterns hold for both English and Turkish children and adolescents and are also comparable to developmental trends found for individual creativity (Besancon & Lubart, 2008; Chae, 2003; Claxton et al., 2005; Lopez, Esquivel, & Houtz, 1993; Smith & Carlsson, 1983, 1985; Daugherty, 1993; Lubart & Lautrey, 1995; Urban, 1991). The findings are also in line with the previous literature showing that collaboration on any task can be challenging for younger children as it can be cognitively demanding for them (Azmitia & Perlmutter, 1989). Younger children need to learn how to discuss and benefit from conversation in collaboration (Leman & Oldham, 2005).

It should be noted that the use of the consensual assessment technique precluded me from making direct comparisons between the creative outputs of English and Turkish participants. As discussed in Chapter 3, the consensual assessment technique has several advantages when it comes to measuring creative outputs. It can be used in different creative domains (e.g., writing poems or stories, creating collages, musical compositions or mathematical word problems) and with different age groups (Baer, Kaufman & Gentile, 2004). The technique relies on assessment of creativity through the actual creative performance rather than measurement of creativity skills or traits. Also,

it is not associated with a particular creativity theory and hence its validity is not affected by the validity of theories (Baer & McKool, 2009). However, because raters are encouraged to use their own individual definitions of creativity, their assessments might be influenced by their cultural background and difficult to compare across cultures (or creative domains). Assessing creativity in a valid and culturally-appropriate way is tricky. De Dreu (2010) proposes three reasons why culture might influence judgement of creativity: (1) Culture may affect the evaluation of novelty, usefulness or even both because what judges see as novel or useful varies across cultures; (2) culture might also affect the importance attributed to novelty and usefulness. For instance, Eastern cultures have been shown to value usefulness over novelty when evaluating creative products (Morris & Leung, 2010; Bechtold et al., 2010); (3) because of this, raters from different cultures might evaluate creativity with different criteria. According to Hempel and Sue-Chan (2010) one way of overcoming these potential cross-cultural differences in judgement of creativity would be to assess novelty and usefulness separately and defining their specific importance for different domains. Another way would be working with bicultural evaluators who have experience with more than one culture's perception of creativity. Future research is needed to develop cross-culturally valid methods to evaluate the creative products of adults as well as children.

### **Social Perspective Coordination and Group Creativity**

Similar to the English sample, social perspective coordination was a significant direct predictor of group creativity in the Turkish sample. Advancing in perspective coordination is a major determinant of how children and adolescents approach and understand others and how they integrate different perspectives (Schultz et al., 2003). These findings are also in line with those reported in the adult literature (Hoever et al., 2012; Ku et al., 2015). Although I replicated the findings of the English study with a Turkish sample, they are not exactly the same. In the Turkish sample, only one of the

## Chapter 5 – Group Creativity Dynamics

social perspective coordination scores (i.e., best choice scores) was associated with group creativity. There can be several reasons for these findings. First, unlike my results for the English sample, none of the mean comparisons between social perspective coordination scores (i.e.; best choice, response rate, composite score) of the two age groups were significant. In other words, the developmental progress in social perspective coordination of Turkish children was not as robust as the one observed with the English sample. Second, there is difference between the age ranges of two samples. These ranged from, on average, 10 to 15 years among the English and from 10 to 14 years among the Turkish sample. Schultz et al (2003) explored the psychosocial maturity of 1237 students from fourth to twelfth grade with the complete RelQ scale and found that overall psychosocial maturity scores increased between a quarter and third of developmental level during each four-year interval, from fourth to eighth and from eight to twelfth grade. Therefore, a one year difference might have been responsible for the different trends of scores in the two countries as Schultz et al.'s (2003) research indicates that social perspective taking skills continues to develop throughout adolescence. Finally another interesting point to consider is the difference between social perspective coordination scores of younger students in the two samples. Turkish students in the younger age group reported higher best choice scores than the English students in the younger age group. Although small, the difference is important considering the developmental progress indices of the relationship questionnaire (Schultz et al., 2003). Therefore, the differences in findings could also be due to the fact that since Turkish children in younger age are already have more advanced development in social perspective coordination around age 10, perhaps much less room is left for further developments of that skill.

Additionally, unlike my results for the English sample, social perspective coordination did not mediate the relationship between age and group creativity in the

## Chapter 5 – Group Creativity Dynamics

Turkish sample. In other words, age did not influence group creativity through development of social perspective coordination. Apart from the differences in sample characteristic (e.g., age span differences) this finding could also be explained by understanding factors underlying creativity development. Although children created together as a group, each of the group members' individual creativity is also at play during collaborative creativity process. Rather than the psychosocial skill of social perspective coordination, it could be the development of divergent thinking of individual members that is driving the productivity of group creativity in the Turkish sample (Charles & Runco, 2001). Moreover, rather than cognitive, affective-behavioural components could be underlying age differences in creativity as well. Claxton et al. (2005) explored development of individual creativity with a longitudinal study including students from fourth to ninth grade using measures of divergent thinking, divergent feelings, and a rating scale for parents. The Test of Divergent Thinking included cognitive-behavioural components (e.g., fluency, flexibility, originality, elaboration), while The Test of Divergent Feeling measure affective-behavioural components, such as curiosity, complexity, imagination and risk taking. Claxton et al. (2005) observed the greatest changes in scores between sixth to ninth grades on both Test of Divergent Thinking and Divergent Feeling. Therefore, those divergent feeling components could also be responsible for the development of group creativity. Clearly, future research should continue to assess which cognitive and affective abilities affect the development of group creativity.

In general, findings on the role of culture in perspective taking and mind-reading abilities are mixed. For instance, while some studies showed no cultural differences on false belief understanding (Callaghan et al., 2005), some found that non-Western children are delayed compared to Western children (Mayer & Träuble, 2013; Naito & Koyama, 2006). It could be that cross-cultural differences cannot be simply attributed

to a global individualism-collectivism distinction; rather, they could originate from specific environmental factors. Recently, Wang, Devine, Wong and Hughes (2016) compared the executive function and theory mind skills of children from primary and secondary schools in Hong Kong and the U.K. They found that while children recruited from local schools in Hong Kong were superior in executive functions test, they lagged behind their U.K. counterparts in theory of mind skills. However, children recruited from international schools were better than British children in both executive functions and theory of mind tasks. The researchers suggested that a much more fine-grained analysis of children's social environment is needed to understand such differences in theory of mind. For example, Wang et al.'s (2016) findings could be better explained by pedagogical differences rather than a global cross-cultural distinction. Indeed, Schultz et al. (2003) found that the psychosocial maturity scores of students from different schools in the same district varied substantially and could be best explained by the schools' social climate. Students not only differed in psychosocial maturity but also in their reports on perceived levels of respect, safety of the school environment, the extent to which they feel they can influence matters in school, and level of social integration. Schultz et al. (2003, p. 84) proposed that:

“When students in a school have Rel-Q scores that are, on average, lower than typical for their grade, it may indicate that the school environment is not supporting the development of students' most mature social interpretations as well as it could. An issue raised by this research is the dynamic behind the lower psychosocial maturity of students in schools with unhealthy social environments: do disrespectful school climates actually lower students' psychosocial maturity or does students' lower performance simply reflect what they observe and experience? Further research may clarify that both processes are at play.” (p.84)

## Chapter 5 – Group Creativity Dynamics

Hence, this might mean that more specific environmental, rather than cultural, factors might have been responsible the lack of progress between social perspective coordination scores of younger and older age groups in Turkey.

In terms of the relation between intrinsic task motivation and group creativity, the results of the previous study were replicated; intrinsic task motivation was a negative predictive of group creativity. One reason for this finding could be that creativity is not encouraged in the Turkish educational system as much as conformity to the group. Specifically, teachers perceive highly creative students as distracted, problematic, and academically less competent (Guncer & Oral, 1993). This is why, even though students are highly creative, they might be feeling less motivated and competent towards creative tasks.

Another reason might be students' perceptions of the collaborative story-writing task. In her thesis, Eastman (2009) looked at the effect of intrinsic and extrinsic motivation priming conditions on Turkish primary school students. Students were asked to individually take part in collage making and story writing activities. One of the post-task questions asked students how much they perceived those two activities as play or work. Turkish children perceived story writing activity much more as work and collage making activity more as play. Eastman (2009) also reported that post discussions with teachers who judged the outcomes of children confirmed that story writing activity was perceived as more similar to class assignments than the collage making activity. Although the current study is not based on individual performance, the same situation might have applied. Participants might have regarded the collaborative story writing activity as one of their usual literature curriculum tasks, rather than a playful creativity activity, and therefore might have felt less motivated towards the task. Moreover, the fact that students were encouraged to write stories that would be judged as creative could have worked as an extrinsic motivator rather than an intrinsic one.

## Chapter 5 – Group Creativity Dynamics

Similar to the results of the English study, adolescents displayed lower intrinsic task motivation compared children. At the same time, groups from the older age group received higher creativity ratings compared younger ones. As noted before, transition from primary to secondary school age is marked by a decline in academic context motivation (Anderman & Maehler, 1994). Thus, older students' general lower motivational levels might have contributed to the results. Moreover, Eastmen (2009) found that particularly students assigned to a condition where they were informed that their work will be judged by teachers (i.e., expected evaluation condition) performed better in both collage making and story writing tasks than the students in intrinsic motivation condition (no particular reason were given), and expected individual reward condition (each student in classroom would receive a reward if they complete the activity), and a group reward condition (students would receive a reward if everyone in the classroom complete the activity). On the other hand, in their experimental study with 5- and 10-year-old children, Amabile et al.,(1986) found that when they assigned children to no reward condition, as opposed to reward condition, children told more creative stories. Thus, reward based extrinsic motivators would not be helping group creativity as well. Rather than intrinsic motivation, synergistic extrinsic motivation sources such as recognition by judges or the sense of competition with other groups (Amabile, 1993), might have been the motivational drive during children's collaborative performance.

### **Group cohesion and group creativity**

Simply putting individuals into groups does not guarantee collaborative productivity and emphasis should be placed on the quality of interaction between group members (Samaha & DeLisi, 2000). Previous research pointed to several important factors for beneficial collaboration such as competence level of children in the groups (Tudge, 1992), friendships in the group (MacDonald et al., 2002; Miell & MacDonald,

2000), presence of feedback, (Tudge & Winterhoff, 1993), differences between representations of the problem (Pine & Messer, 1998), and task design (Howe, Tolmie, Greer & McKenzie, 1995). Concerning creative collaborations of children, emotions (Vass, 2007), friendship (Miell & MacDonald, 2000), and transactive communication (MacDonald et al., 2000) are some of the variables that researchers have focused on. However the research on group dynamics in children's collaborative creativity is limited and no previous research has looked into the role of group cohesion in children's creative collaborations.

In the present study, I found that increasing task cohesiveness in children's collaborations improves the creativity of their outcomes. The present results fit well with research suggesting that from middle childhood to adolescence there are changes in children's perceptions of group dynamics and how they approach group work (Abrams et al., 2007; Leman, 2015). At around age 8, children benefit from collaborations as information sources; however as they progress to adolescence they begin to appreciate groups as coordinated units and benefit from cohesion as well as active exchange of ideas (Baines & Howe, 2010; Leman, 2015; Leman & Oldham, 2005). Peer relationships gain more importance during the transition from mid-childhood to adolescence and they evolve into social relationships characterized by mutual understanding and sharing of opinions (Rubin, Bukowski & Parker, 2006). As children start building quality relationships, they also perform better in groups. They start realizing group members have different skills and assets, and they coordinate their performance accordingly (Leman, 2015). Children who took part in the current study were in that transition from mid-childhood to adolescence. Their increased knowledge about group work as well their more mature approach towards collaborations allowed them to benefit from the increases of task cohesion. The fact that both older and younger age group benefited from cohesion might seem like a contrast to previous

research (Leman, 2015). However considering the age span in current study (i.e.; 10-14 years), this is a reasonable finding; children in the current sample might have already reached the age where they start appreciating importance of group dynamics.

The findings are also in line with previous literature on the role of cohesion in adult group creativity (Hülshager et al. 2009; Mullen & Copper, 1994). Strong task cohesion that marks commitment and being innovative is particularly beneficial for creativity as opposed to interpersonal cohesion that is defined by commitment to positive interpersonal relationships in the group (Paulus et al., 2012). For instance, Craig and Kelly (1999) found that interpersonal and task cohesiveness are both effectively supporting creativity in idea generation stage, whereas only task cohesion is critical at the implementation stage where technical qualities of the product plays a more prominent role. Collaborative story writing task can also be thought of occurring in stages. The group first had to generate many ideas on the genre, characters, plot, etc. Then, a particular suggestion had to be picked. This process requires both interpersonal and task cohesion; interpersonal cohesion helps group members to participate freely, whereas task cohesion fosters the goal of accomplishment in the task (Zaccaro & MaCoy, 1988; Craig & Kelly, 1999). The implementation stage of the story was writing the narrative which required attention to technical details as well as maintaining novelty. This stage was more additive and required strong coordination between members; hence task cohesion is needed in this stage more than interpersonal cohesion (Zaccaro & MaCoy, 1988; Craig & Kelly, 1999). Groups who took part in my research were composed of classmates who knew each other before, which brought a level of already existing interpersonal cohesion. However, the manipulation of task cohesion allowed groups to perform better compared to the ones who did not receive the manipulation.

### **Limitations**

The current research has revealed interesting findings on the development of collaborative creativity in Turkey, and it also replicated some of the results that I found in previous research conducted in England. However, there were some limitations. First, the current research explored the role of task cohesion on group creativity of children from Turkey. Due to the nature of school settings and difficulty of random assignment, children from the same classrooms were recruited. Therefore, they already had an existing level of interpersonal cohesion as they were class mates. Future research should also investigate how manipulating interpersonal cohesion would influence the collaborative creativity performance with children who never met before. Moreover, the scale used for measuring perspective coordination (RelQ) was adapted from its original English version (Schultz et al., 2003). I have worked with schools with similar socioeconomic backgrounds and included parallel age groups in both Turkey and England samples in order to maintain conditions necessary for cross-cultural research. However, no pilot tests were conducted which is a necessary process for complete cultural adaptation of the scales (Widenfelt et al., 2005). The small sample size was also a limitation for cross cultural adaptation of the scale. Certain items may be more prone to culture-specific interpretations than others and data collection with larger samples will allow understanding if this would be the case (Widenfelt et al., 2005). Similar to the limitation discussed in Chapter 4, providing information on groups' age and gender compositions to teachers might have created a certain level of bias in their judgements. Future research should conduct assessments where no sample information is provided to the raters. Furthermore, as discussed above, one reason that explains the negative association between group creativity and individual task motivation level could be that extrinsic motivators, rather than intrinsic motivators, might be operating during collaborative story writing task. Thus, future studies should include measures that will

capture the whole spectrum of motivational dimensions (see Deci & Ryan, 2002).

Perhaps, including an adapted version of the Sports Motivation Scale (Zahariadis, Tsorbatzoudis, & Grouis, 2005) for children could be helpful for future collaborative creativity studies. Finally, due to practical constraints, unlike the previous study, group videos were not analysed for transactive communication or occurrence of intersubjectivity. Cross-cultural comparisons of these constructs in group context would provide very valuable knowledge for creativity research.

### **Implications**

Forming effective and productive collaborations is not a very easy task for children, yet it is one of the key aspects of socio-cognitive development. One of the vital aspects of collaboration is integrating different perspectives (Piaget, 1932). However as pointed by Leman and Oldham (2005): “This ability appears not to be automatic but to come with age, experience and above all development.” (p.44). The current research adds that certain group dynamics such as cohesion should be operating in order for the groups to be productive. Future research can advance our knowledge by understanding how certain group characteristics and cohesion can interact. For instance, previous research showed that friendship in peer collaborations is a very important facilitator for group creativity of children (MacDonal et al., 2002). Whether task cohesion can influence groups of friends and groups of strangers in the same way or not could be explored in an experimental setting. There is a vast amount of literature on antecedents of adult group creativity; however group creativity research in children is very limited. It would be very helpful if future research could contribute to our understanding as to whether group process variables facilitating adult group creativity, such as collective efficacy, team affect and team mood (Kozlowski & Ilgen, 2006), diversity, conflict, or trust (Paulust et al., 2012), are also prominent in group creativity of children. Another interesting line of research would be the role of minority dissent in

## Chapter 5 – Group Creativity Dynamics

children's group creativity. Studies with adults demonstrated the positive role of minority dissent in team innovation, particularly if it occurs under specific conditions like high degree of team involvement (De Dreu & West, 2001). A potential research idea would be to understand the role of minority dissent in cohesive and non-cohesive groups of children. Finally, although the current research points to benefits of manipulating group dynamics for group productivity, the long term effects of these manipulations are not known. Therefore, longitudinal applied studies which will further investigate long term benefits of teaching children to collaborate in a group would be another fruitful area of research. For instance, the intervention program by Tolmie et al. (2007) on group work of primary-school children on scientific tasks was found to effective even after an 18-month interval. A similar design could be used to explore the effectiveness of implementing group work training on collaborative creativity of children and adolescents.

### **Conclusions**

As we further progress into 21<sup>st</sup> century, new sets of cognitive and social skills, which include creativity, problem solving and collaboration, are being emphasized as necessary competencies (Greiff, Niepell & Wustenberg, 2015). Therefore, a reform in education that will give more focus to creativity and collaboration is more vital than ever. The changes in Programme for International Student Assessment's (PISA) recent reports are pointing to the necessity of reform as well. PISA publishes assessments from domains of science, mathematics and reading in representative countries worldwide through 3-year cycles. In 2012, a measure of creative problem solving and in 2015, assessment of problem solving in teams were also included in addition to primary PISA cycle assessments of traditional domains (Greiff et al.,2015).

Despite the rising importance of collaboration, we still do not know how to form high quality collaborations which rarely occur on their own (Hämäläinen & Vähäsantanen, 2011). Furthermore, even less is known on how to foster collaborative creativity across development and cultures. The present study was the first to experimentally investigate the role of task cohesion on the collaborative creativity of children and adolescents from Turkey. By using a collaborative story writing task, this study showed that increasing the cohesiveness of groups also increases creativity of the collaborative outcomes. Moreover, groups composed of adolescents produced stories rated as more creative by teachers compared to groups of children. Finally, intrinsic task motivation was found as a negative predictor of group creativity. These findings have valuable implications for educational settings, both locally and globally.

**CHAPTER 6: GENERAL DISCUSSION – What have we learned and what needs to be done?**

On April 24, 1990 The Hubble space telescope was carried into orbit by shuttle "Discovery". Hubble cost more than any other NASA spacecraft, even more than the Apollo mission. Weeks after the launch, the team came to a horrible realization. The telescope now orbiting the Earth had a fatal manufacturing flaw. There was something wrong with the technical specification and no one had noticed it, in spite of years of testing. The future of NASA and all space exploration, was compromised because Congress wasn't going to waste billions of dollars again for such a mission. NASA needed a creative and quick solution and to reach that, scientists and engineers collectively worked. They combined solitary spark of insights with more conscious team effort. In the end Hubble was repaired, and it performed even better than expected (Sawyer, 2007).

In this thesis, I aimed to extend our understanding on group creativity and to contribute to the resolution of open questions and unresolved discussions in the field. I addressed social flow and its facilitators (i.e., empathy and motivation) in different performance art domains, the role closeness and perspective taking in group creativity of adults, development of group creativity in children, the role of social perspective taking coordination, intrinsic motivation and cohesion in children's creative collaborations, and cultural influences on group creativity in children and adolescents. Finally, I developed a task of collaborative story writing, validated its use across three studies and discussed its strengths and weaknesses. The findings of this thesis which are summarized and discussed below provide a number of insights on open questions in group creativity. They allow us to expand, critique and revise what we have learned about creativity of groups so far.

### **I. Social Flow**

Flow is a state of consciousness characterized by enjoyment of the activity and a complex balance of perception of challenge and perception of skills (Csikszentmihalyi, 1975; 1990; 1993). As a key process in optimal performance, flow is also suggested to be a significant contributor to creativity in different domains including music, theatre and dance (Byrne et al., 2003; Jeong, 2012; MacDonald et al., 2006; Martin & Cutler, 2002). Traditionally, flow is assessed at the individual level, however recently it was also conceptualized as a group phenomenon (Sawyer, 2003; Walker, 2010). While individual flow represents individual's state of mind, group flow represents the experience of whole collective and as Sawyer (2003, p.46) stated "it cannot be reduced to psychological studies of the mental states or the subjective experiences of the individual members of the group." Yet, this social aspect of flow was not emphasized in the field except a few studies (Armstrong, 2008; Salanova et al., 2014).

In Chapter 2, I explored the flow experienced in the context of large collaborations of dance, orchestra and musical theatre. Since I relied on participants' individual flow experiences what I captured was not equivalent to the group flow experience as conceptualized by Sawyer (2003). As suggested by Walker (2010) social flow can be distinguished from solitary flow as the unit of performance is group, the balance between challenge and skill of all group members is relevant, tasks require cooperation and coordination, group members focus on each other, and feedback provided to whole group is important. Accordingly, flow in large collaborative contexts (as studied in Chapter 2) can be conceptualized as social flow. The findings from Chapter 2 expanded our knowledge with regards to correlates of social flow. First, the domain of performance was not a factor affecting the level of flow experienced. However, all domains included in the study (dance, musical theatre, orchestra) can be classified as performance arts (Sinnamon et al., 2012), and I argued that this could be

the reason for absence of differences. On the other hand, domain influenced the level of motivation. Second, I conducted the study with cohorts that were recruited at different times of the year to see if getting more familiar with the group members and the group environment changes the involvement and enjoyment level of participants as reflected through flow state. There was no difference between the flow experiences of participants from different cohorts. Empathy and motivation were found as important correlates of social flow. Finally, domain moderated the related between empathy and flow.

### **The Role of Empathy and Motivation in Social flow**

The research conducted in Chapter 2 is the first to show that the empathy of group members increases their social flow experience with a quantitative approach and these findings are in line with theoretical expectations and findings of existing qualitative studies (Hart & Di Blasi, 2013; Myers & White, 2011; Waddington, 2013). Sawyer (2003) suggested that connections between group members, such as close listening skills, the capacity of blending the egos, and a sense of familiarity, are key for experiencing group flow, and these group member processes closely resemble empathy. Empathy's significance for social flow is in line with findings of the studies reported in Chapters 4 and 5 where social perspective coordination was found to be a positive contributor to the group creativity of children and adolescents. Collectively, these findings imply that intersubjectivity is a significant part of the group creativity process, either defined through evaluations of creative products (Chapters 4, 5) or by indicators of optimal creative performance (i.e., flow; Chapter 2).

The role of motivation for flow state has been previously acknowledged in the literature (Kowal & Fortier, 1999, Martin & Cutler, 2002, Pelletier et al., 1995). My findings extended these findings by showing that especially self-determined types of motivation such as intrinsic motivation, integrated and identified regulation, explain

increases in flow states of performers in three different art domains. Furthermore, findings revealed differences in motivation (defined according to Self-determination Theory, Deci & Ryan, 1985) between the domains of orchestra, dance, and musical theatre, and these differences demonstrate the presences of domain specificity in social flow, which is discussed in the next section.

### **Domain Specificity in Social Flow**

The issue of domain specificity versus domain generality has been a debated topic in creativity research. In this current thesis I adopted the domain specificity approach and advocated that a person's creativity in one domain cannot be generalized to other domains (Baer, 1998; Baer, 2010, Baer, 2012; Baer & Kaufman, 2005; Sullivan & Ford, 2010). As argued by Kaufman & Baer (2002, p.10); "Many other skills or traits associated with creativity might appear on the surface to be domain general (e.g., divergent thinking ability, task motivation, openness to experience, tolerance of ambiguity) but may actually be domain specific." In Chapter 2, I investigated flow experiences, motivation levels, as well as inter-relations between flow, empathy and motivation in performance groups of dance, orchestra and musical theatre. While domain did not influence the overall experienced level of flow, it affected motivation as well as the relation between empathy and flow. Dancers revealed higher internal motivation compared to both musical theatre and orchestra members, while musical theatre and orchestra did not differ. Moreover, orchestra members displayed lower external motivation compared to both musical theatre members and dancer. These findings confirmed earlier research (Baer, 2010, 2012; Kaufman & Baer, 2002). Furthermore, the relation between empathy and flow was most pronounced for dancers. It appears that dance, particularly improvised forms of dance, is a special domain in terms of the flow experience. Dancers sync during improvisation in terms of emotions, perceptions, intentions, actions, and movements. They constantly need to observe other

dancers, cooperate with them, accept them, and adapt to them (Ribeiro & Fonseca, 2010). In order to fulfil these requirements dancers share emotional and physical experiences and skills (Riberio & Fonseca, 2010). They form empathic connections (i.e., kinaesthetic empathy) that lead to collective actions and joint motor movements (Godard, 1995 cited in Riberio & Fonseca, 2010). Orchestra members also rely on the formation of empathic connections. Anticipating the action of fellow members, monitoring own and other member's actions as well as relying on other members' anticipated intentions are some of the mechanisms underlying empathic connections in orchestral and musical performances (see Sevdalis & Keller, 2014 for a review).

### **Implications**

These findings on social flow have several implications for researchers and educators. First, the assessment of social flow requires different tools to the assessment of individual flow. An ideal way to measure group flow would be through observations and/or performers' retrospective evaluations of the performance (Armstrong, 2008). In his research with secondary school mathematics students, Armstrong (2008) captured flow through its observable qualities, such as physical (i.e., posture, positioning, gestures, facial expressions) and verbal behaviours (i.e., tone of voice, repeating words/phrases, rate of speech, fragmentation of speech). He proposed that;

Group flow appears to manifest itself in a quicker form of these physical and verbal behaviours, a synchronization of action- for instance a physical closeness, an echoing of gestures and phrases, a quick fragmented way of speaking where members seemed to be finishing off each other's sentences- that suggests a parallel synchronization of thought.” (Armstrong, 2005 cited in Armstrong, 2008, p.103).

Assessing flow in social context could be used as a powerful reflective tool to monitor learning and engagement in classroom environment and can also support

creative activities. Students who are fully engaged with creative tasks, whose levels of skills and challenge is higher than what they usually experience may produce more creative and high-quality outcomes (Byrne et al., 2003). If teachers can design classroom tasks that will boost students' motivation and engagement (i.e., autotelic experience), students would produce high quality work and they would be eager to repeat that process again (Byrne et al., 2003).

When it comes to domain specific differences, there are lessons to be learned, particularly from the unique nature of dance for facilitating social flow and group creativity. Dance has been previously used as a tool to understand the behavioural and brain basis of action understanding and social cognition on the subjects of motor action, learning and memory, action, intention and emotion understanding and finally audio-visual synchrony and timing (see Sevdalis & Keller, 2011, for a review). Particularly, the synchronisation aspect of dance is quite relevant for establishing coordinated group work. According to recent studies, synchronous interaction enhances interpersonal understanding and group interaction (Baimel, Severson, Baron & Birch, 2015; Tuncgen & Cohen, 2016). Thus, an interpersonal bonding session/training through synchronisation could also initiate social flow and might support collective creative performance. Improvisation is one of the characteristics of group creativity alongside collaboration and emergence (Sawyer, 2003) and it can also be used as a tool to foster flow experience, intersubjectivity, and collective creativity. Sawyer (2003) thought that the flow experience is highly likely to occur especially during improvisation and he conceptualized his group flow concept on the basis of his observations with improvised jazz musicians and improvisation theatre actors. He stated (2003, p.5); “Although group creativity is found in all groups, improvisation is particularly interesting because it exaggerates the key characteristics of all group creativity: process, unpredictability, intersubjectivity, complex communication, and emergence.” Improvisation can also be

## Chapter 6 – General Discussion

used with children, either within an art domain or as a form activity itself, to support their engagement in creative activities, increase their potential to experience flow and form fruitful creative collaborations. Through collective improvisation, children can develop their interaction skills, how to listen and respond, their peer relationships and how to collaborate (Sawyer, 2003).

Forming musical group interactions could be another context for developing social flow as well as empathy. Rabinowitch, Cross and Burnard (2012) conducted a long-term musical group interaction program with primary school children. Comparisons of before and after measurements showed that children had higher emotional empathy scores after the program. A similar program, where individuals can work together in a musical task, could be designed for promoting social flow experiences of both children and adults.

Underachievement is a common problem in performance groups even in those cases where they are formed of highly competent members (Karau & Williams, 1993). Social flow experience is a promising phenomenon to support optimal group performance. Yet the mechanisms behind social flow's effect on performance are not entirely clear. What does social group flow achieve exactly? Does it primarily provide intrinsic motivation, similar to individual level flow (Csikszentmihalyi, 1990), or does it create a balance between intrinsic and extrinsic motivations (Sawyer, 2003)? Or does it serve as a basis for empathic connections that will lead to a group mind which is different than sum of its individuals? Finally, can we expect to see specific effects of social flow in different domains?

### **II. Group Creativity in Adults**

Previous research in group creativity mostly relied on sociocognitive models such as input-process-output models (Glaveanu, 2011). In line with these models, research on group creativity has investigated three aspects: inputs (task, group

composition), processes (participative safety, task orientation), and output (the number and quality of innovations) (Paulus & Dzindolet, 2012; West, 2002, 2003). However, as shown by Hulsheger et al.'s (2009) meta-analysis, group process variables play a key role in group creativity and were often overlooked in the literature (Bectholdt et al., 2010). Nevertheless, group creativity is highest when groups have creative individuals and efficient creativity-relevant processes (Pirola-Merlo and Mann, 2004). In Chapter 3, drawing on the MPI-G model, I focused on the role of two distinct interpersonal process variables in group creativity, namely closeness and perspective taking. My study was an attempt to experimentally investigate the effect of closeness, in the sense of increased self-disclosure, as well as perspective taking and their additive effect on group creativity. Closeness gained through self-disclosure was proposed as a potential trigger for prosocial motivation in groups as it promotes liking (Certner, 1973). On the other hand, perspective taking was proposed as a potential trigger of epistemic motivation in the group creativity context as it contributes to exchange of ideas in groups (De Dreu et al., 2011; Somech, 2006). Findings showed that the closeness manipulation benefited group creativity, whereas perspective taking decreased it. Additionally, receiving both closeness and perspective-taking manipulations did not benefit the creativity of groups.

With regards to the effect of closeness on group creativity, these findings are in line with previous research displaying benefits of increased overlap in self-other conceptualization in group processes (Galinsky et al., 2005; Ku et al., 2015). Self-disclosure builds trust in teams, is an important element in interpersonal, and fosters intimacy growth (Rosh, Offermann & Van Diest, 2012). Although cohesion is not the result of intimacy, sometimes development of high intimacy can turn into high cohesion (Prager, 1995, cited in Rosh et al., 2014), if groups operate more with interpersonal purpose rather than task purposes, this could harm group creativity. Janis's (1982) work on groupthink revealed that is not group cohesion itself but the interpersonal aspect of it

that challenges a group's performance. Therefore, I argued that the right amount of intimacy of closeness in groups is the key for optimal group creative performance. As Weick and Roberts (1993) suggested, groups need to reach an optimal state; "a combination of developed group- undeveloped mind." (p.375). In my experiment, when both closeness and perspective taking were manipulated, this was more harmful than beneficial for groups' creative performance.

It is hard to reach a concrete conclusion on the combined effect of these variables. Nevertheless, it is also important to consider that closeness and perspective taking arguably has overlapping interpersonal effects. Previous research showed that perspective taking can increase self-other mental representation overlap, liking, closeness, helping, decrease prejudice, and stereotyping (Davis et al., 1996; Galinsky et al., 2005; Sprecher et al., 2013). Therefore, closeness coupled with increased awareness of others' mindset would inevitably lead to more interpersonal connection, more-than-desired harmony, which can all end up in suboptimal performance (which was indeed the case in my research). These findings resemble previous arguments that harmony in group creativity could be a double edge sword and might decrease creative performance (Jaussi & Dionne, 2003; Staw, 2009), depending on its level (Paulus & Dzindolet, 2008). Therefore, I can argue that composing groups with members of moderate closeness would be a useful strategy for improving group creativity. Once a moderate closeness level is established, the emphasis should be on developing task commitment, an influential cohesion dimension for group creativity (Mullen & Cooper, 1994). Some researchers provided arguments about curvilinear effects of various variables including cohesion (Woodman et al., 1993), time pressure (Baer & Oldham, 2009), task conflict (De Dreu, 2006) on group outputs and performance. As noted by Paulus et al. (2012), most variables need a degree of balance in order to support optimal group performance.

One surprising finding was the negative influence of perspective taking on group creativity, which contrasts with previous research (Galinsky et al., 2005, Ku et al., 2015). I argued that trying to put yourself into shoes of others can be quite effortful (Lin et al., 2010) and cognitively demanding (Apperly et al., 2006), especially in a challenging task like writing a story collaboratively in a short period of time. Although perspective taking has been seen as a facilitator of social bonding recent findings contradict this idea (see Ku et al., 2015 for a review), and it is now argued that: “Perspective takers balance self-versus other-regard and cooperative versus competitive responses, depending on their own psychological state, the target’s intentions, and the interaction context.” (Ku et al., 2015, p.18). Nevertheless, it would be unwise to disregard the benefits of perspective taking for group creativity. Future studies should take into account psychological states of group members as well as the contexts and tasks. When groups initially form, members tend to be concerned with establishing group norms, and they focus more on commonalities than differences (Van der Zee & Paulus, 2008). This might block idea exchange and the richness of difference of perspectives and hence counteract any potential benefit that perspective taking can bring. Therefore, it would be best to wait until establishment of group norms and psychological safety, to start supporting groups’ perspective taking. A study by Watson, Kumar and Michaelsen (1993) found that early in a semester, diversity was negatively correlated with creativity for groups of business students. However later in the semester, once groups get more familiar, creativity was positively correlated with diversity. In other words, once group members have reached a level of cohesion, they started benefiting from diversity in perspectives (Paulus et al., 2012).

## **II. Group Creativity in Children**

### **Development of Group Creativity**

Creativity develops through changes in cognition, changes in personality and motivation, and changes in environment (Lubart & Sternberg, 1998). General trends in creativity research point to out that individual creativity increases across childhood and adolescence (Besancon & Lubart, 2008; Chae, 2003; Lopez, Esquivel, & Houtz, 1993; Smith & Carlsson, 1983, 1985). However, there is no consensus over the exact course of this developmental pattern due to mixed findings on peaks and slumps observed during different phases of development (Charles & Runco, 2001).

The results obtained in the studies reported in Chapters 4 and 5 of this thesis confirmed the developmental trend observed for creativity at individual level; group creativity increased across middle childhood and adolescence and groups formed of adolescents produced more creative outcomes compared to groups of children. These findings were in line with previous studies with children showing that collaboration is challenging for younger children (Azmitia & Perlmutter, 1989), particularly because they still need to learn how to discuss and benefit from conversation in collaboration (Leman & Oldham, 2005). These results are also in line with research showing that children display more tendency to work in groups and group work gets more sophisticated as they transfer from primary to secondary schools. Baines, Blatchford and Kutnick (2003) found that change in complexity of peer interaction was especially increased from grade 5 to grade 7 (approximately from age 10-11 to age 13-14). These observed changes are due to many reasons including decreasing amount of tutoring by adults as children develop as well as the development in necessary communicative skills required for managing challenges inherent in group tasks (Baines et al., 2003).

### **The Role of Social Perspective Coordination**

In both of the studies reported in Chapters 4 and 5, I found that social perspective coordination skills, a person's ability to differentiate and integrate perspectives (Selman et al., 1986) was predicting successful creative collaborations of children. These findings are in line with previous research displaying the importance of perspective taking skills in collaborative interaction (Tomasello, Kruger & Ratner, 1993). Advancing in psychosocial maturity (measured by the developmental progression of perspective coordination) is a major determinant of how children and adolescents approach and understand others and how they integrate different perspectives (Schultz et al., 2003). As children develop into adolescence, a deeper understanding of perspectives and their origins in social experiences facilitate negotiation and problem solving skills (Martin, Sokol, & Elfers, 2008). Social perspective taking is important for successful peer relationships, (Selman et al., 1997), risk taking behaviour (Selman & Dray, 2006) and also children's writing abilities (Dray et al., 2009). My findings extend the previous research by showing that social perspective coordination skills of group members are also an important facilitator for collaborative creativity.

This is also in line with previous research on the positive role of perspective taking in group creativity of adults (Hoever et al., 2012; Ku et al., 2015). On the other hand, as discussed above, I was surprised to find that perspective taking had a negative influence on the group creativity of adults (see study reported in Chapter 3). At first glance, this might appear as contrasting findings to study 2, 4 and 5; however, I explored different conceptualizations of perspective taking in these three studies. Perspective taking is commonly referred to as the cognitive skill of trying to understand other's thoughts, motives, feelings, and attitudes (Ku et al., 2015; Parker, et al., 2008), and in Chapter 2, I conceptualized it as a state-based construct. On the other hand,

## Chapter 6 – General Discussion

Selman (Selman et al., 1985; Schultz et al., 2003), whose psychosocial maturity framework I relied on for measuring social perspective coordination, places social perspective taking as well as interpersonal negotiation in a social context and emphasizes the social aspect as the fundamental initiator and maintainer of the developmental advancement of that ability. Thus, the psychosocial ability of social perspective taking coordination of children was conceptualized as a trait based psychosocial ability, which includes not just perspective taking but also interpersonal negotiation skills. Therefore, although there are commonalities between these constructs they are not exactly same. Differences in conceptualizations of perspective taking imply the difficulty of making a direct comparison on the results obtained with adults and children. Martin, Sokol and Elfers (2008, p.313) proposed that;

The process of perspective taking involves taking up orientations of persons to situations that contain possibilities for acting. Our understanding of others' perspectives is enabled by our active participation in webs of interpersonal interactivity, not from mental feats of 'mind-reading' as theory theorists claim.

While I support the interpersonal emphasis on understanding perspective taking, I do not disregard the cognitive aspect of perspective taking, despite its negative effect observed in Chapter 3. The findings in Chapter 2 displayed that empathy (as a cognitive and affective construct) was a predictor of flow experienced in large collaboration settings. Overall, this implies that perspective taking should be placed in a hybrid combination of affective, cognitive and psychosocial realms. It is a developing skill, shaped by social context, yet it is also a cognitive and affective construct that allows us to take into account others' thoughts, feelings and attitudes. In that sense, it can be situationally increased. On the overall role of intersubjectivity in creative collaborations, the answer is not crystal clear. Is it the process of group members' placing themselves into shoes of others, their mutual sharing of affective states or is it

their developing ability to identify, adapt and merge perspectives within their social context, that benefits group creativity (or simultaneously all of them)? Or is it possible to say that what aspect or what type of perspective taking drives creative collaboration can be defined by the developmental period of group members?

Another important variable in this puzzle is domain specificity of creativity. According to the findings of Chapter 2, the positive association between empathy and flow was stronger in the domains of dance and orchestra. Considering this, we could also ask whether perspective taking benefits group creativity (or not) depending on the domain studied. Dray et al. (2009) showed that the 10-year-old children's social perspective taking and the depth of social awareness conveyed in their narratives were positively influencing the quality of their persuasive letter and narrative writings. Hence, perhaps while a task like collaborative story writing requires emphasizing social aspects of perspectives, for a dancer it could be the empathic skill of tuning with other dancers to prove more vital. Future studies that can track cognitive perspective taking, empathic skills as well as social perspective taking with samples from different developmental stages, in different domains of creativity, both cross-sectionally and longitudinally would help us to clarify these questions.

### **The Role of Intrinsic Motivation**

The role of motivation in individual creativity received significant attention as it is seen as a vital part of individual creative process. According to Amabile (1996) without it, there will not be a considerable creative performance. Previous studies with adults showed that intrinsic motivation positively influences individual and group creativity (Amabile, 1998; Cooper & Jayatilaka, 2006; Hennessey & Amabile, 1996), with people being more curious, more risk taking, and allowing them to be cognitively flexible (Utman, 1997; Zhou & Shalley, 2003). However, some researchers showed a weak or non-significant link between intrinsic motivation and creativity in different

## Chapter 6 – General Discussion

domains (Dewett, 2007; Eisenberger & Aselage, 2009; Perry-Smith, 2006; Shalley & Perry-Smith, 2001), and this was observed for children's group creativity as well (Amabile et al., 1986). The studies reported in Chapters 4 and 5 explored the role of intrinsic motivation (as combination of intrinsic motivation and perceived competence) in collaborative creativity practices of children and adolescents. The study conducted with English participants (Chapter 4) revealed weak and negative association of intrinsic motivation and group creativity. The relation between intrinsic motivation and group creativity was also negative but stronger in Turkish students (Chapter 5).

It is likely that rather than intrinsic motivation, a synergistic extrinsic motivator (e.g., rewards, recognition, and sense of competition) might have been the underlying motivation of participants in these studies (Amabile, 1993). Another likely reason would be the general decline of motivation in academic context while students transfer from primary to secondary school (Anderman & Maecher, 1994). Thus, rather than specific task motivation towards collaborative story writing, my results could be due to the general decline in academic motivation. On the other hand, perceived competence (which was negatively associated with group creativity) is a critical construct particularly for creativity. Children have a tendency to underestimate their creative self-efficacy (Beghetto et al., 2011) and according to my results across two studies (Chapters 4 and 5) especially adolescents suffer from that tendency. Self-efficacy and perception of competence are very significant aspects of creativity that should not be underestimated as individuals with higher creative self-efficacy display more creative behaviour (Chuang, Shiu & Cheng, 2010). More importantly, creative-self efficacy is also positively associated with motivation in academic settings (Deci & Ryan, 1985; Eccles et al., 1998; Eccles & Wigfield, 1995; Gottfried, 1990), and this association gets stronger with age (Fredricks & Eccles, 2002; Wigfield et al., 1991). Therefore, fostering

creative self-efficacy from early on is a vital not just for fostering creativity, but also for general academic achievement.

If intrinsic motivation and perceived competence (i.e., creative self-efficacy) have quite profound effect on creativity, how can we facilitate them? Specifically, how can we help students with fluctuations that they experience in motivation throughout the school years, at least in their creative collaboration contexts? The first step to be taken would be identifying the actual source of lack of motivation. Previous research on children's motivation is mostly conducted in academic context; nevertheless it is insightful as it reveals that children's motivation can be shaped by various factors, including relationships they have with their teachers (Kelly & Hansen, 1987, cited in Martin, 2008), with peers (Wigfield & Tonks, 2002, cited in Martin, 2008), school culture (Anderman & Maehr, 1994), socio-demographic status (Becker & Luthar, 2002), and age. Second, we have to understand if lack of motivation is related to the task itself. Previous research with Turkish primary school children (Eastman, 2009) showed that even a playful activity like story writing could be observed as work rather than play and it is performed more creatively under more extrinsically motivated conditions as opposed to intrinsic interest. At this point we can also ask; how can we convert children's perceptions towards creativity, away from activities associated with academic tasks? The answer to that question is hidden in plain sight. Placing creativity in a play context would boost children's motivation towards creative tasks as well as their creativity. Play can facilitate all of the factors that enable individual creativity including cognitive, affective and motivational and hence, improve creativity itself (Mainemelis & Ronson, 2006). According to Hoffmann and Russ (2016), especially pretend play is quite effective in supporting development of creativity because many of the cognitive and affective processes involved in creativity, such as divergent thinking, combining multiple ideas, and expressing emotions, are also involved in play.

## Chapter 6 – General Discussion

Empirical and applied research points to that both individual and group level play can help to build children's creativity skills (Hoffmann & Russ, 2016). But we do not know whether a play-based intervention program would also help children to build (intrinsic) motivation towards creative activities as well as creative self-efficacy. This could be an interesting future direction for researchers in the field of creativity as well as motivation. Third, as my findings with adults participating in different art domains demonstrated (Chapter 2), the profile of the motivation that one experiences (i.e., more self-deterministic or less-deterministic) is changing according to field of performance. The same applies for children. Gottfried (1990) found that 7- to 9-year-old children's intrinsic motivation differed by domain. Thus, it appears that children's competence beliefs and intrinsic motivation are changing across domains, and any intervention program should take this into account. For example, it would not be very efficient to place children who are motivated towards music into a program aiming to foster their motivation towards creativity with creative writing activities,

### **The Role of Cohesion**

The role of cohesion for group performance is still a topic of debate (Hulsheger et al., 2009; Paulus & Dzindolet, 2012). The cause of this debate is rooted in the paradoxical state of group creativity, which has been termed the cohesion-creativity divide by Staw (2009). Specifically, as Staw (2009, p.319) states, "processes that transform a collection of people into a group or team - things like coordination, social norms, and hierarchy- are exactly the processes that pose limitations to variety. They work to homogenize the membership and limit its potential for deviance and novelty." One way of resolving the paradox has been taking into account the multidimensional nature of cohesion (i.e., task cohesion and interpersonal cohesion; Craig & Kelly, 1999).

The research on peer collaboration has mainly focused on joint problem solving and group collaboration in the domains of science and mathematics (Rojas-Drummond

et al., 2008). Very little is known on children's collaborative creativity and what type of group dynamics operate in that process. Previously, cohesion was found to positively influence the group work of older children as opposed to younger ones (Leman, 2015). In Chapter 5, I investigated the role of cohesion on collaborative creativity practices of Turkish children and found that task cohesion is positively affecting group creativity of children and adolescents. These findings extended our understanding of collaborative creativity in younger ages by displaying that similar to what has been found with adults, in the sense of task focus was benefiting creative stories written by groups of children. Bernthal and Insko (1993) found that the combination of low social-emotional (i.e., interpersonal) cohesion and high task cohesion resulted in the lowest level of groupthink perceptions. Craig and Kelly (1999) showed that interpersonal and task cohesiveness both effectively supported creativity in the idea generation stage, whereas only task cohesion is critical at the implementation stage. Consequently, it could be said that the findings of Chapter 5 (positive effect of task cohesion on children's group creativity) and Chapter 3 (the effect of closeness on adult's group creativity) are supporting previous research in a complementary way. A moderate amount of interpersonal cohesion (i.e., closeness through self-disclosure), coupled with task cohesion provide optimal group creativity environment.

Baines et al. (2009) present various reasons as to why group collaborations of children often fail, such as lack of involvement in group work, exclusion of some members, lack of consensus between members, unresolvable conflicts, disorganization, wasting time with off-task topics, judgemental group climate, and lack of motivation towards task or working in groups. Therefore, supporting group work in children would require a multidimensional approach in which task-focus, interpersonal relationships, as well as motivation towards task and perceived competence would all be supported simultaneously.

### **The Role of Culture**

Is creativity universal or culture-specific? Do commonly accepted aspects of creativity (i.e., novelty vs. usefulness) demonstrate validity for all cultures, or some aspects are more valued in some cultures than others? There is no consensus on this subject and while some researchers argue for the culture specificity in creativity (Lubart & Sternberg, 1998; Niu, & Sternberg, 2001), others favour universal view of creativity (Plucker, 1998). In Chapters 4 and 5, I investigated group creativity of children and adolescents from England and Turkey through their collaborative story writing performances. The fact that stories were judged in two different cultures by different judges prevented me from conducting a direct cross-cultural comparison. Nevertheless, the similarity between the designs of the two studies allowed me to make some observations concerning potential cultural difference and similarities. First, group creativity success progressed with age and in both samples older age groups wrote more creative stories compared younger ones. Second, social perspective coordination was found as potential explainer of this development in both samples. Next, the developmental progress of social perspective coordination skills was different in the two samples; the developmental progress of Turkish children was not as robust as the one observed with the English sample. Specifically, the younger age group in Turkey revealed higher scores in social perspective taking coordination compared to the younger age group in England. These differences revealed in correlations as well; one type of social perspective coordination score was not correlated with group creativity in the results of Turkish sample. Findings on the role of intrinsic task motivation in group creativity were similar; in both samples intrinsic task motivation (including perceived competence) was lower in adolescents, and intrinsic task motivation was negatively associated with group creativity, however the negative association was slightly more profound for Turkish sample. Overall, it is difficult to conclude whether culture played

a role in group creativity performances of children from these two different cultures without direct statistical comparisons. Nevertheless, the findings obtained in these two samples imply that while advancement of group creativity over development is culturally universal, the group processes underlying this developmental progress might be more culture-specific. Future studies should look into the role of culture in collaborative creativity of children with tasks that allow direct cross-cultural comparisons.

According to Erez and Nouri (2010), the influence of culture on creativity is moderated by social context and task. Culture has a more significant role on tasks that are tied to cultural values, such as co-working with peers or supervisors, while the effect of culture is less profound when working alone and privately. Following this insight, we would expect similar findings in England and Turkey on individual creativity tasks. However, in group creativity tasks, cultural variations would be more likely. In that sense, perhaps the slight differences of England and Turkey sample in terms of the association between social perspective taking and group creativity could be due to how cultural variations and norms associated with group processes in these two cultures. Moreover, as I have shown in Chapter 2, domain specificity should be considered in collaborative creativity contexts. Domain differences could additionally explain cultural variations. Cultural differences may be observed not only in creative achievements or creative processes of groups, but also specific domains within (De Dreu, 2010). For instance, Turkish children can be seen as more creative in scientific collaborations as Turkish culture values novelty in that domain (Oner, 2000), but they might be less original in musical collaborations since the culture puts less value on that domain.

### **III. Methodological considerations**

The field of group creativity is dominated by the reliance on divergent thinking tasks (i.e., brainstorming; e.g., Mullen et al., 1991; Nijstad, Diehl & Stroebe, 2003; Paulus, 2000) which emphasizes the ideational aspect of creativity (i.e., fluency, flexibility, originality). Despite its popularity, divergent thinking procedures such as brainstorming are subject to problems of production blocking (Diehl & Stroebe, 1987) and motivation loses (Paulus & Dzindolet, 1993). More importantly, not all research conceptualizes creativity as equivalent to divergent thinking (Runco & Acar, 2012). In order to overcome these weaknesses associated with divergent thinking measures and to capture group creativity in a way that reflects the conceptualization of creativity in the current thesis (i.e., combination of novelty and usefulness), I adopted a collaborative story writing task inspired by Hennessy and Amabile (1988). The task was not an additive task like brainstorming, but it required group members to combine, elaborate, and implement ideas in a meaningful way to result in one single product (creative stories). Furthermore, collaborative story writing has high face validity as it reflects the challenges of creative performances in real life verbal and artistic creativity tasks (Hennessey & Amabile, 1988; Sawyer, 2011). The task has been reported to be a very engaging and fun task both by students and teachers. Creativity assessments in this task were conducted on the basis of the consensual assessment technique, a robust way of assessing creativity through the actual creative performance rather than measurement of creativity skills or traits (Baer & McKool, 2009). Consensus between our judges' ratings of the creativity of the produced stories was high which demonstrates that our method was reliable to evaluate creativity of groups.

One important point to consider in the use of the collaborative story writing task is that it relies on the judgement of expert, and their evaluation of creativity is still a debated topic in the field of creativity (Karwowski, 2010; Runco & Johnson, 2002).

## Chapter 6 – General Discussion

Gralewski and Karwowski's findings (2016) provided quite shocking findings on that matter; for example, some raters (teachers in that case) who did not understand creativity and misjudged the creative potential of their students. Teachers' ratings revealed that boys' creativity was predicted by factors like nonconformity, intelligence, and school grades, whereas girls' creativity was only related to school grades. Future studies can either move from relying on teachers as sole judges of creativity or train raters in terms of their perceptions of creativity. In order to evaluate group creativity in a reasonable way, we need judges who will be faithful to different aspects of creativity, who can take into account cultural (Glaveanu, 2010, 2011), developmental differences as well as social and domain based aspects of creativity (Erez & Nouri, 2010).

### **Concluding Remarks**

Creative understanding does not renounce itself, its own place in time, its own culture; and it forgets nothing. In order to understand, it is immensely important for the person who understands to be located outside the object of his or her understanding—in time, in space, in culture. For one cannot really see one's own exterior and comprehend it as a whole, and no mirrors or photographs can help; our real exterior can be seen and understood only by other people, because they are located outside us in space and because they are others. (Bakhtin, 1986, p. 7, cited in Glaveanu, 2015)

In this dissertation, I explored the role of group-level processes in collaborative creativity in different art domains, for groups of different ages and from different cultures. Throughout the dissertation, I first pointed to the role of interpersonal understanding in collaborative creativity by evaluating the influence of different aspects of intersubjectivity (empathy, perspective taking, social perspective coordination, transactive dialogue) in both social flow and group creativity. Overall, these findings revealed that different conceptualizations of intersubjectivity have different implications on the collaborative creativity process. While the state-based ability to take perspectives of others is not found helpful for group creativity of adults groups, trait-based empathy was found to be associated with increased social flow and, similarly, the development of social perspective coordination skill was an important antecedent of the group creativity success of minors.

Moreover, the positive influence of closeness on group creativity pointed to the importance of interpersonal harmony, whereas, facilitation of group creativity practices of children and adolescents through task cohesion revealed the necessity of task-related

## Chapter 6 – General Discussion

group commitment for group creativity. Additionally, the positive role of self-determined types of motivation in social flow as well as the negative associations between intrinsic task motivation and group creativity in younger people expanded our knowledge on the relation between motivation and creativity. Finally, I contributed to the group creativity literature by adapting a collaborative story writing method to assess group creativity and validating it across three studies. My results demonstrate that different lines of research (i.e., on flow and group creativity, developmental, and cultural differences) can mutually inform and enrich each other in understanding the role of interpersonal and motivational processes on group creativity. At a very broad level the results of the current thesis suggest that researchers and practitioners should be mindful of cognitive, motivational, interpersonal, cultural and domain specific processes occur in the collaborative creativity of adults, adolescents, and children. Using integrative and multi-disciplinary approaches can help us open up the black box of creativity even more and can foster our understanding of how groups move from aggregation of individuals to successful collective entities. I hope that the results of this thesis will inspire the next steps in future research on group collaborations and will inform practices in organizations as well as educational settings.

## Appendix 1.1

### CHAPTER 3 – Perspective Taking Manipulation Instructions

In this group activity, please try to take the perspective of the other members of your group together with your own perspective. Research has shown that when working together in a group on tasks like these, groups in which members take each other's perspective on top of their own perspective perform better. Taking the perspective of another person means that you try to view matters as if you were in the other person's shoes.

This means:

- Try to ask yourself what might be important to the other persons in your group
- When someone in your group says something you don't understand, ask yourself why they are saying it
- When you disagree about something, find out why you disagree
- Try to understand how the other persons view the situation

## **Appendix 1.2**

### **CHAPTER 3 – Closeness Manipulation Instructions**

Before you start the story-writing task, can you please briefly mention some information about yourself on the paper you have been provided. Please start with writing your names, your profession and work place, if you are a student what do you study and where do you study. Then I would like you to give a bit more specifics about yourself. You can write about your hobbies, your general likes and dislikes. Then finally, I would like you to mention briefly about what are your goals and expectations with regards to the future. You can also mention about any particular fears or hopes from the future.

You don't need to give a detailed response to any of these questions. The aim of this exercise is just to give a brief idea about who you are to the other group members. The information should be limited to a few sentences. Once you have written your personal description, you will pass that sheet to the group member sitting on your right and you will receive the information sheet written by the group member sitting on your left. This will be repeated again, until every group member reads the information about all other group members. You can be assured that nobody else will read this information, and the papers will be destroyed right after this session. The purpose of this exercise is to help group members to be more familiar with each other.

**Appendix 2**

**CHAPTER 4 – Relationship Questionnaire**

This questionnaire is not a test and there are no right and wrong answers to any of the questions. Each student will have different opinions, thoughts, and feelings about different issues or situations. We are interested in your experiences and what you think about certain things. We hope that you will find these questions interesting.

- For each incomplete sentence, indicate with a check mark whether you think that each sentence completion is POOR, OK, GOOD, or EXCELLENT.
- Next, write the letter (a, b, c, or d) of the choice that you think is the best in the box provided.

**EXAMPLE**

It's good to work hard in school because

	Poor	OK	Good	Excellent
a. You might win an award	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. You don't have a choice about being there, so you might as well	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. You will feel good about yourself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. It will make your parents happy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Write the letter (a, b, c, or d) of the choice that you think is the best in this box:

## Appendices

1. Jody doesn't like the idea of shoplifting or stealing things from stores. One day Jody's best friend Naomi says she is going to steal something from a store and asks Jody to go with her. Jody says she doesn't want to, and Naomi calls her a wimp. Jody could

	Poor	OK	Good	Excellent
<b>a. Tell Naomi not the steal</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>b. Explain to Naomi why she thinks stealing is wrong and talk her into not stealing</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>c. Persuade Naomi that stealing is not worth the risk of getting caught</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>d. Just walk away</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Write the letter (a, b, c, or d) of the choice that you think is the best in this box:**

2. Steve and David are friends. One day at school, they try to decide what they want to do that night. Steve wants to invite a new kid in school to go to movies with him and David. David wants to go to movies alone with Steve. David could

	Poor	OK	Good	Excellent
<b>a. Tell Steve that he can't go because he's sick</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>b. Tell Steve he won't go</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>c. Explain to Steve why he wants the two of them to go alone, ask Steve to explain his position, and then figure out what to do</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>d. Tell Steve he'll go to the movies with Steve and the new kid if he and Steve can do something alone together later</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Write the letter (a, b, c, or d) of the choice that you think is the best in this box:**

Appendices

3. Gloria, who has a ten o'clock curfew, goes to a party on Saturday night. She gets home at 12:00 and her father is waiting up for her. He is very angry and grounds her for a month. Gloria feels the punishment is too severe and thinks she is old enough to stay out past 10.00. Gloria could

	Poor	OK	Good	Excellent
a. Storm out of the room	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Tell her father he can't tell her what to do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Ask her father to work with her on an agreement which would allow her to stay out later on weekends.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Explain to her father why she feels she's old enough to stay out late	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Write the letter (a, b, c, or d) of the choice that you think is the best in this box: <input type="checkbox"/>				

4. The head teacher of the school has told the student council that this year there are no funds for after-school activities such as sports and art. Because a lot of students in the school are upset about losing these activities, Ruby and the other members of the student council need to decide what to do. Ruby and the other student council members could

	Poor	OK	Good	Excellent
a. Begin an awareness campaign to get parents to understand how important sports and art are for the students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Offer to paint the school building in return for money for after-school programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Don't do their school work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Go to the next school governors meeting and tell people to get the money for sports and art	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Write the letter (a, b, c, or d) of the choice that you think is the best in this box: <input type="checkbox"/>				

Appendices

5. Amy is very athletic and likes sports. She particularly likes football and decides to try out for the neighbourhood team one spring, even though there are no other girls on the team. During the try outs, some of the boys start “dissing” her, saying that football is for boys and that they don’t want her on the team. Amy tries out anyway, but the next day when the coach announces who made the team, Amy is not chosen. Amy could

	Poor	OK	Good	Excellent
a. Tell the coach “I know I played better than some of the boys who made the team and you know I deserve to be on it.”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Say to the coach what she thinks about not making the team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Slam her locker door and tell her friends what she thinks of the coach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Go to the coach and hear his reasons for not putting her on the team and explain her point of view to him	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Write the letter (a, b, c, or d) of the choice that you think is the best in this box:

6. Holly is baby-sitting for her little brother, Max, so her parents can enjoy a Saturday out. Before they leave for the evening, they tell Holly to be sure not to let Max watch any TV after 9:00. Holly sends Max to bed at 9:00 and stays up to watch a movie she’s been wanting to see. At 09:30, Max comes downstairs, awakened by a bad dream, and asks to stay up and watch TV with Holly because he can’t sleep. Holly should say to Max

	Poor	OK	Good	Excellent
a. “I’ll let you stay up, I know you are scared.”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. “You can stay up. Just be quiet so I can watch the movie.”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. “You can stay up- Mum and Dad will understand that I let you stay up because you had a bad dream.”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. “You can stay up- Mum and Dad wouldn’t want you to be alone when you’re afraid.”	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Write the letter (a, b, c, or d) of the choice that you think is the best in this box:

## Appendices

7. Tara and Simon have a date to go roller-skating. An hour before she is supposed to leave home to meet Simon, Tara gets a call from a friend who has an extra ticket to a football game and would like Tara to come with her. The game starts at the same time Tara is to meet Simon. Tara calls Simon to change their plans, but gets Simon's answering machine. Tara should

	Poor	OK	Good	Excellent
a. Leave the message "A friend called and offered me a ticket to today's football games, so I'm going. I'll call you when I get back."	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Leave the message "I know you'll be disappointed, but I have to change our plans. I was looking forward to seeing you, and I'm sorry about this. I'll call you when I get back."	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Leave the message "I have to change our plans to go skating. I'll call you later."	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Call back after the game	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Write the letter (a, b, c, or d) of the choice that you think is the best in this box:

Appendices

8. Dan’s grandfather doesn’t speak English and needs to find a job. Dan, who does speak English, goes out with his grandfather to help him find work. Dan sees a restaurant with a Help Wanted sign in the window and goes inside to speak with the owner. Because his family needs money so badly, Dan lies to the man, telling him that his grandfather knows how to cook. Dan also lies to his grandfather, telling him the owner has hired him even though he knows he isn’t a cook. Dan lies to his grandfather because he

	Poor	OK	Good	Excellent
a. Is thinking only about himself and not about how his grandfather might feel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Is thinking about earning money to feed his family, and so he didn’t think about how his grandfather might feel.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Thought that once he had time to explain the situation to his grandfather, he would understand and forgive him	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Thought his grandfather would be upset if he knew Dan had lied to the man hiring cooks.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Write the letter (a, b, c, or d) of the choice that you think is the best in this box:

9. My best friend and I do things separately sometimes because:

	Poor	OK	Good	Excellent
a. We ignore each other when we’ve had a fight	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. We can’t agree about what to do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. We like to do different things	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Our friendship is secure without always being together	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Write the letter (a, b, c, or d) of the choice that you think is the best in this box:

Appendices

10. When my best friend and I don't agree on what to do, I might:

	Poor	OK	Good	Excellent
a. Try to convince my friend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Listen to my friend and work it out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Get upset and go away to be by myself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Go along with my friend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Write the letter (a, b, c, or d) of the choice that you think is the best in this box: <input type="checkbox"/>				

11. When I don't agree with the adult I'm closest to, I might:

	Poor	OK	Good	Excellent
a. Try to convince them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Just forget it	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Listen to them and work it out	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Get so upset and I run into my room	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Write the letter (a, b, c, or d) of the choice that you think is the best in this box: <input type="checkbox"/>				

12. I sometimes don't agree with what my teachers tell me at school because:

	Poor	OK	Good	Excellent
a. They blame me for things I don't do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. I need to stick up for what I think and believe is right	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. I don't think they understand my point of view	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. I don't listen to them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Write the letter (a, b, c, or d) of the choice that you think is the best in this box: <input type="checkbox"/>				

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