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The Effects of Empathy on Cooperation

by

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I dedicate this thesis to

my family (father, mother and brother)

for their constant support and unconditional love.

I love you all.

谨以此论文

献给我挚爱的家人

— — — — — — — — — — 吕杰妤

Statement of Originality

I, Jieyu LV, confirm that the research included within this thesis is my own work or that where it has been carried out in collaboration with, or supported by others, that this is duly acknowledged below and my contribution indicated. Previously published material is also acknowledged below.

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Abstract

Empathy induced altruism is considered as the motivation of human cooperation, one of the most prominent pro-social behaviours in society. To explore the empathy-cooperation link, this thesis presents a series of empirical studies designed to uncover how reliable this association is. Specifically, the introductory chapters present an evidence-based systematic review and discussion of current theories, which take a critical view of the methodological approaches and provide the context and theoretical motivations for the empirical work of the thesis. The empirical chapters present four studies conducted in the laboratory to evaluate empathy-cooperation association, as well as other potential mediating factors via Public Goods Game (PGG) reflecting collective action in society (total approx. 540 participants). Study 1 was a replication of a highly cited finding that has been often used to support theoretical claims regarding the positive empathy-cooperation link, which in the present case was not found when examined using the PGG set up. Study 2 further explored the empathy-cooperation link alongside the impact of personal values as an information signal to support cooperative behaviour, to this end, shared social values predicted cooperative behaviour above and beyond empathy. Study 3 examined the extent to which empathy could be used to support cooperation in heterogeneous group settings by manipulating the distribution of endowments and the origin of endowments; again empathy had a limited effect on levels of cooperation. Study 4 was a replication of Study 3, but using a 2-player PGG, leading to differences between the patterns of results from the previous experiment. The concluding section considers the implications of the findings for current theories that build on the empathy-cooperation link. Overall the experimental findings do not support the

statement that empathy induction is an effective way of promoting cooperation in PGG when financial incentives are involved. This enriches the understanding of empathy-cooperation research.

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Chapter 1 An Evidence-based Systematic Review

Empathy and cooperation are considered to be interlinked, in both psychological theory and in a common understanding of the terms (Prot et al., 2014). The existence of the link between empathy and cooperation has been the subject of conceptual speculation for centuries, at least since A. Smith (1759) mentioned the connection in his book "The Theory of Moral Sentiments". The idea proposed was that empathy has a critical role in maintaining peace and conflict resolution in society. However, does this strong assumption have an empirical basis to it? Indeed, how reliable is the connection between empathy and pro-social behaviour, particularly cooperative behaviour? Whether empathy is fundamental to cooperative behaviour, as had previously been considered by key thinkers, is the central interest and driving force of this project, which explores "empathy" and "cooperation" as two fundamental concepts for human interaction, and what the nature of the link between them is.

The whole thesis presents a series of empirical studies designed to uncover how reliable this association is. There are many studies of empathy and pro-social behaviour, but the starting point for this thesis is that the methodological approaches used thus far leave a lot to be desired in terms of being able to draw firm theoretical conclusions. Therefore, the introductory chapters present an evidence-based systematic review that takes a critical view of the methodological approaches used to explore the association between empathy and cooperation, and provides the context for the empirical work of this thesis. Chapter 1 introduces the approach to tackling these issues, providing a justification for the later empirical work that was conducted in the thesis. In addition, it also presents a rationale for the methodological

approaches taken in the project. Thus Chapter 1 operationalizes empathy and cooperation and the different possible associations proposed in the literature. In Chapter 2, current theories concerning the empathy-cooperation link are discussed along with the issues regarding definitions of empathy, which have impacted theory and empirical practice. Driven by these theories, several new studies were designed and conducted to explore the association between empathy and cooperation, and the role of other variables such as value and status. The sections that follow present the four conducted empirical studies (Chapters 3, 4, 5 and 6). Study 1 uses the Public Goods Game (PGG) to replicates a highly cited finding often used to support theoretical claims regarding the empathy-cooperation. Study 2 further explores the empathy-cooperation link alongside the impact of personal values as information signals that support cooperative behaviour. Study 3 examines the extent to which empathy could be used to support cooperation in heterogeneous compared to homogeneous group settings (by manipulating both the financial endowments that participants received at the start of the game, and the origin of status). Study 4 is a replication of Study 3, but using a two-player version of the PGG, leading to identifiable differences between the patterns of results from the previous experiment. The concluding chapter presents a summary of the findings, discusses the methodological considerations, and reflects on the implications for current theories that build on the empathy-cooperation association.

1.1. Introduction

To provide a clear answer to the question “what is the association between empathy and cooperation?” a systematic review was conducted of the psychological research that has been geared towards answering this question. While there are several reviews that have critically evaluated the different theoretical perspectives on

cooperation (Colman, 2003; De Dreu, 2013; Fehr & Schmidt, 1999; Kollock, 1998; Sachs, Mueller, Wilcox, & Bull, 2004), to date, there are no reviews of the methodological approaches to investigate empathy, and in particular the relation between empathy and cooperation. More relevantly, only a few psychologists (Eisenberg & Miller, 1987; Underwood & Moore, 1982) have reviewed empirical investigations of the link between empathy and pro-social behaviours since 1970. However, these past reviews were neither systematic reviews nor, of course, provide coverage of research conducted since. Therefore, clearly such a review would help consolidate the literature enabling researchers to uncover general patterns in existing findings and, when there are inconsistencies, indicate where those inconsistencies are, and speculate upon the basis of their occurrence. There are other grounds for conducting a systematic review of the methodological and empirical findings concerning the connection between empathy and cooperation. Firstly, there is an assumed natural connection between empathy and pro-social behaviour; this is because the process of empathizing with others is expected to increase the likelihood of understanding another person's feelings and responding to them in a sensitive manner. But given this strong assumption how well does the support it? Without a comprehensive systematic review of the findings, the question would remain unanswered. Secondly, there are a variety of pro-social behaviours of which cooperation is but one, yet up until now work looking at the relationship between pro-social behaviours and empathy does not tend to distinguish between different types of pro-social behaviours. This means that it is worth looking at the specific evidence for one type of pro-social behaviours and its link to empathy, and then establishing if this is then generalizable to all forms of pro-social behaviours. Also, although there are many studies of empathy and pro-social behaviour, the methodological approaches

may contain limitations that make it difficult to draw firm theoretical conclusions. Therefore, the aim of this review is to examine the methodological and empirical findings of work examining the relationship between empathy and cooperation, to provide evidence-based insights for appropriate research communities, and offer guidelines for further empirical research studies and theoretical developments.

Unlike traditional narrative reviews, an evidence-based systematic reviews strive to comprehensively identify, appraise, and synthesize all the relevant studies on a given topic, often used to test a single hypothesis (Petticrew & Roberts, 2008). In addition, it attempts to collate all relevant evidence that fits a pre-specified eligibility criteria to answer a specific research question (Moher et al., 2015). A systematic review can also provide reliable estimates about the effects so that conclusions are defensible, demonstrate where knowledge is lacking, and can be used to guide future research and inform policy. A meta-analysis (Balliet & Van Lange, 2013a, 2013b; Vachon, Lynam, & Johnson, 2014; Zelmer, 2003) is a statistical synthesis of similar quantitative studies, involving the calculation of standard effect sizes from each study and the pooling of summary data to produce a single overall effect size.

In the present project, a meta-analysis was not conducted because the approach was to examine a broad conceptual idea regarding the type of relationship empathy and cooperation share, and in turn evaluating the way empirical studies explore this relationship. Moreover, the type of data generated from several different methodologies makes it difficult to carry out a meta-analysis, simply because there are too few studies that implement the same methodology to enable a sensible meta-analysis. Therefore, given these considerations, a systematic review was conducted with the research question “What is the association between empathy and cooperation in adult populations?”

1.2. Method

As discussed, this systematic review was conducted in order to explore the relationship between empathy and cooperation according to the protocol of Preferred Reporting Items for Systematic review and Meta-Analysis protocols (Moher, Liberati, Tetzlaff, Altman, & Group, 2009; Moher, et al., 2015).

1.2.1. Eligibility Criteria

There were several criteria for the selection of studies included in this systematic review. First, studies had to be conducted on non-clinical adult participants (age 18 years and above). Second, only English Language publications from 1975 to 2014 within the field of psychology research were considered. Third, only empirical laboratory studies that examined the relationship between empathy and cooperation were included. Finally, studies collecting behavioural or psychophysical responses were included, but neuropsychological evidence (e.g., EEG/ERP, fMRI, MEG) were omitted. The reason for this was to reduce unnecessary variability across experimental responses and ensure that the experimental studies employed in the present systematic review were directly comparable and focused on behavioural findings.

1.2.2. Search Strategy & Study Records

Databases widely used for multiple disciplines are “Web of Knowledge” and “Scopus”, and the specific psychology database typically used is “PsycINFO”. All three were used to search for relevant articles. The Boolean operator “AND” was used to search for the conjunction of both key words “empathy” and “cooperation”. The details of the search and selection of articles for this review are shown in Figure 1.

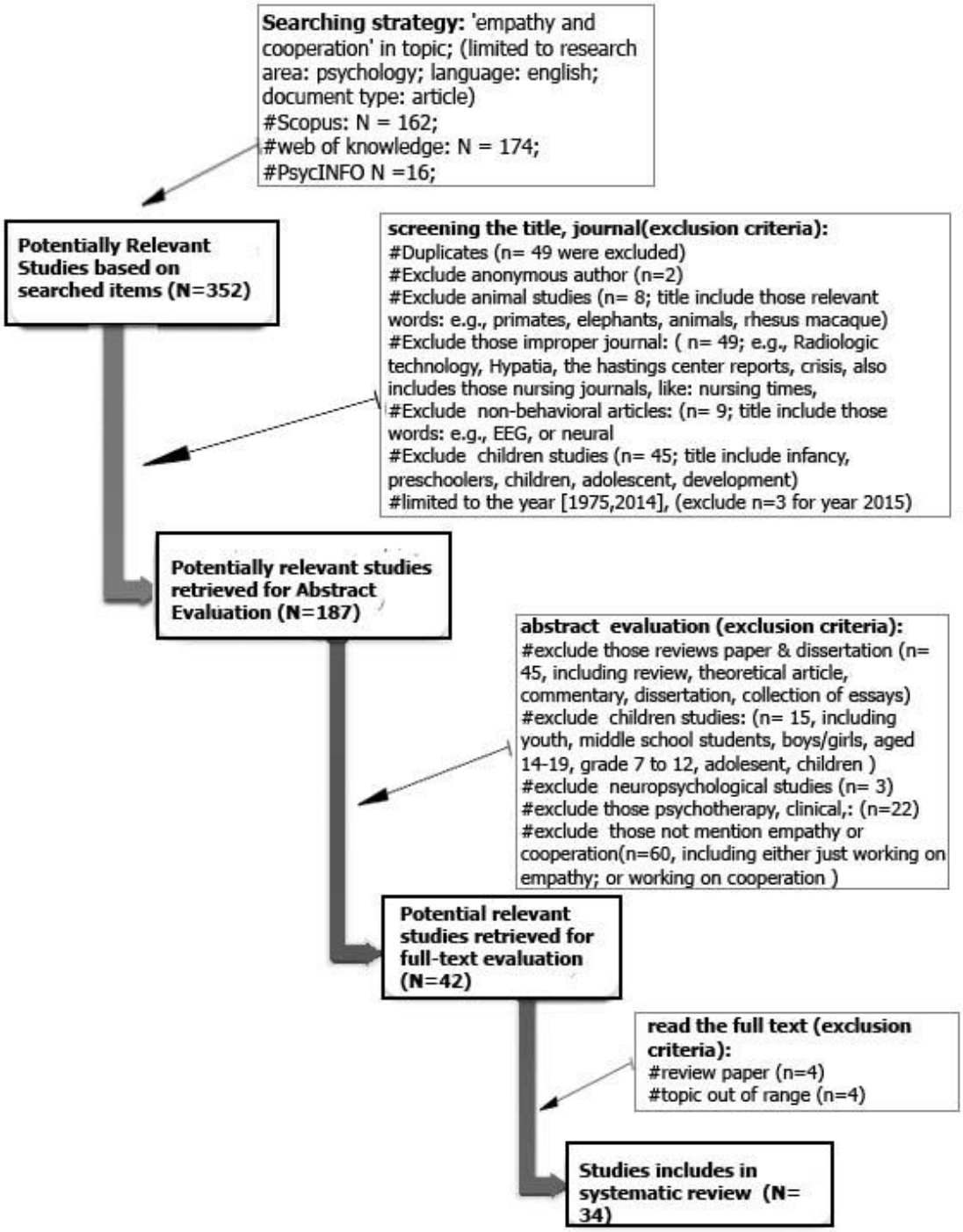

Figure 1. The flow diagram of this systematic review (The search was conducted on articles on 24th March 2015)

1.3. Results

In this review the current findings concerning empathy and cooperation are discussed based on the logic of exploring their association. While a variety of ways in which empathy and cooperation have been investigated separately exist, there are just three clear groupings in the empirical work that examine the nature of their relationship. The following three approaches are: correlation between empathy and cooperation (E ∞[1] C) (n=11); the effect of empathy on cooperation (E→C) (n=13); the effect of cooperation on empathy (C→E) (n=10). The general findings of each category are discussed as following.

1.3.1. Category 1: Correlation between Empathy and Cooperation (E ∞ C)

The correlational approach is used to explore whether an individual's empathy ability is correlated with cooperative behaviours. Overall, 11 research studies were found and allocated to Category 1. Table 1 presents a summary of the evidence from these research studies.

Five out of the 11 studies directly examined the correlation between empathy and cooperation (Edele, Dziobek, & Keller, 2013; Eisenberg, Fabes, et al., 1989; Eisenberg, Miller, et al., 1989; Paal & Bereczkei, 2007), as shown in Figure 2A. For

[1] This symbol ∞ here refers to conceptual "correlation", although ∞ is usually reserved for "infinity" in mathematic context. (Andrew Colman, Personal communication)

these 5 studies, general findings revealed a positive correlation between empathy and cooperation (Edele, et al., 2013; Eisenberg, Fabes, et al., 1989; Eisenberg, Miller, et al., 1989; Marks, Penner, & Stone, 1982; Paal & Bereczkei, 2007). For example, Paal and Bereczkei (2007), using the social cooperation scale of Cloninger's Temperament and Character Inventory, found that the better the mindreading skills people reported they had, which was taken as an index of empathy, the more willing they were to cooperate. However, in Edele, et al. (2013)'s study, because several measurements of empathy were used, there was no correlation between empathy and cooperation when empathy was measured by Movie for the Assessment of Social Cognition.

Turning now to the experimental evidence from the rest of the studies (6 out of 11), they investigated a mediating effect of empathy on other factors and cooperation, in which empathy is considered as the mediating factor, demonstrated in Figure 2B. The mediating variables were behavioural, biological, psychological and/or social constructs that transmit the effect of one variable to another variable (MacKinnon, Fairchild, & Fritz, 2007; Rucker, Preacher, Tormala, & Pettey, 2011). This evidence showed that empathy was a mediator factor between similarity in personality/values and cooperation (Krebs, 1975); relationship contexts (kin member or stranger) and cooperation (Maner & Gailliot, 2007); individual differences regarding trust and cooperation (Irwin, McGrimmon, & Simpson, 2008); stress and cooperation (McGinley et al., 2009); listening to pro-social songs and cooperation (Greitemeyer, 2009); and personal contact and cooperation (Koschate, Oethinger, Kuchenbrandt, & Dick, 2012). These six studies provide indirect evidence for the positive correlation between empathy and cooperation.

In summary, exploring the correlation between empathy and cooperation was examined in both direct correlation (as Figure 2A) and indirectly through empathy as a mediating factor (as Figure 2B). Direct correlations between empathy and cooperation found a mixed and unstable correlation between these two constructs, and this was influenced by the measurements of empathy, based on the evidence presented in Table 1. More than half of the evidence indicated that empathy mediated the other variables and cooperation, which supported the positive correlation between empathy and cooperation.

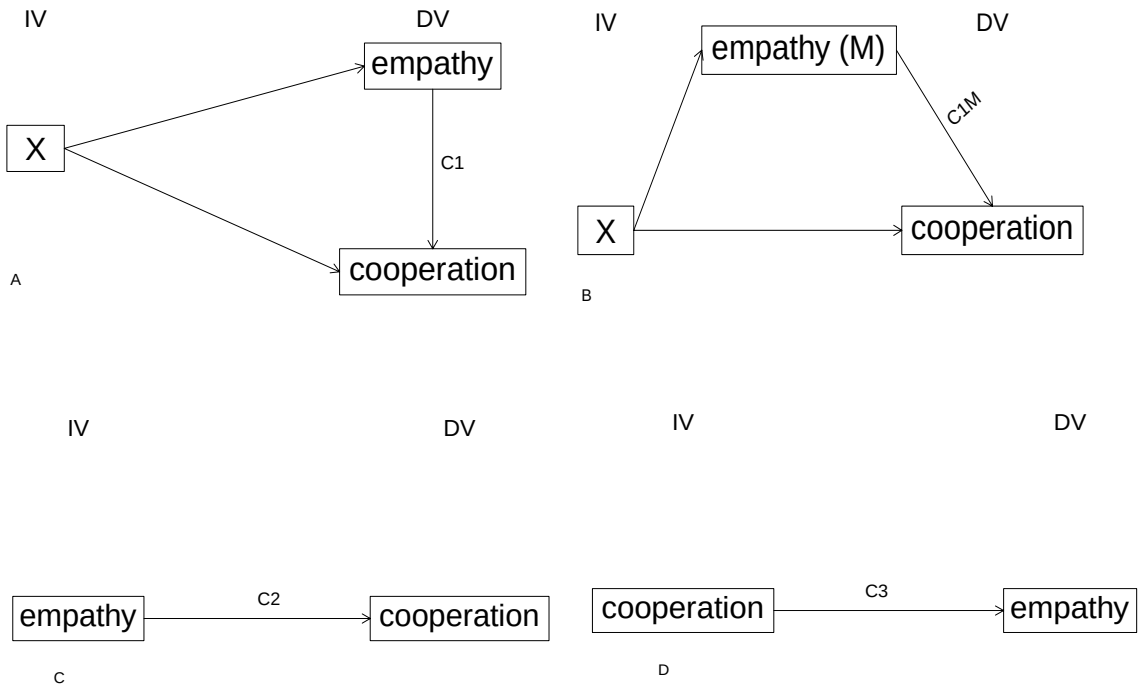

Figure 2. The graphical representation for A. the correlation between two dependent variables (empathy and cooperation); B. the indirect effect of the independent variable on the dependent variable (cooperation) through the mediator variable (empathy); C. the total effect of the independent variable (empathy) on the dependent variable (cooperation); D. the total effect of the independent variable (cooperation) on the dependent variable (empathy), partially based on figure from (M. S. Fritz & MacKinnon, 2008; MacKinnon, et al., 2007, p. 595)

Table 1 *Studies included in Category 1: Correlation between Empathy (DV) and Cooperation (DV) (E ∞ C) (n=11)*

Record	Study	*N*	% of females in sample	Measure of empathy (DV)	Measure of cooperation (DV)	*E ∞ C*	Graphical model	Concepts of empathy	Type of pro-social behaviour
1777*	Krebs.,(1975)	60	0	14 indices of empathy were measured; 3 subjective reports; 11 psychophysiological measures	A chance to win money or receive a shock on the bonus trial	+	C1M	3	Cooperation
1797 *	Marks, Penner, & Stoner (1982) Study 1	159	0	STAI-State Anxiety Scale (A-State) (Spielberger et al., 1970)	A list of 21 possible outcomes and an envelope containing $2; The choices varied along a continuum of selfishness-helpfulness;	0	C1M	7	Cooperation
798 *	Eisenberg et al., (1989)	69	53	Facial indexes; Facial and self-report indexes; Heart rate; 2 sympathy scales	Hours offered to help	+	C1	8	Helping
797 *	Eisenberg et al., (1989)	78	48	Four adjectives from the emotional response questionnaire	The number of hours that could be donated to help X around the house	+	C1	8	Helping
				IRI	The same as above	+	C1	8	Helping
1788 *	Maner & Gailliot (2007)	154	68	Rates of emotions; General-Specific (GS) assessment based on items that include sad, low-spirited, heavy-hearted.	Willingness to help	+/0	C1M	8	Helping
441 *	Paal & Bereczkei (2007)	127	60	Mindreading ability test	TCL	+	C1	1	Cooperation
769 *	Irwin et al, (2008) Study 1	61	66	Emotion IFQ presented after vignettes	PDG	+	C1M	8	Cooperation
	Study 2	88	54	The same as above	PDG	+	C1M	8	Cooperation
1798 *	McGinley et al., (2009)	148	67	Empathic concern subscale from IRI	PTM (for men)	+	C1M	8	Pro-social
					PTM (for women)	0	C1M	8	Pro-social
1790 *	Greitemeyer, (2009) Study 4	50	62	Self-ratings of sympathetic concern, compassion, soft-heartedness, tenderness	DG	+	C1M	5	Sharing
772 *	Koschate et al., (2012) Study 2	185	NG	IFQ	OCB (for individual-directed pro-social behaviour)	+	C1M	8	Helping
					Four items (group-directed helping behaviour)	0	C1M	8	Helping
757 *	Edele et al., (2013)	35	46	IRI	DG	+	C1	1	Sharing
				MET-CORE		+/0			
				MASC		0			

Note. All references referred to in Table 1 are organized by publication year. In addition, IRI: Interpersonal Reactivity Index (Davis, 1983); TCL: Social Cooperation Scale of Cloninger's Temperament and Character Inventory test (Cloninger et al., 1994); IFQ: Impression and Feelings Questionnaire (Batson, 1991); PDG: prisoner's dilemma game; DG: dictator game; PTM: The Pro-social Tendencies Measure (Carols & Randall, 2002); OCB: organizational citizenship behaviour (Smith, Organ, & Near, 1983); MET-CORE: the Multifaceted Empathy Test (photo-test) (Dziobek et al., 2008); MASC: Movie for the Assessment of Social Cognition (movie-test) (Dziobek, et al., 2006); NG: not given. The findings reported are scored simply according to the following: +: positive effect; 0: null effect; -: negative effect. In column 8, it refers to the

relationship between empathy and cooperation, here C1 refers to correlation between two dependent variables (empathy and cooperation), as depicted in Graph A of Figure 2; C1M refers to the indirect effect of the independent variable on the dependent variable (cooperation) through the mediator variable (empathy), as depicted in Graph B of Figure 2.

1.3.2. Category 2: Effect of Empathy (IV) on Cooperation (DV) (E→C)

In this research approach, empathy was introduced as an independent variable to examine the effects of empathy on cooperation in laboratory settings, as demonstrated in Figure 2C. Table 2 presents the studies included under this category. Overall, most research studies (11 out of 13) found that empathy induction promoted or at least maintained cooperative behaviour (Allsop, Fifield, & Seiter, 2002; Batson & Moran, 1999; Cialdini et al., 1987; Eimontaite, Nicolle, Schindler, & Goel, 2013; Fultz, Batson, Fortenbach, McCarthy, & Varney, 1986; Oswald, 1996, 2002; Pavey, Greitemeyer, & Sparks, 2012; Rumble, Van Lange, & Parks, 2010; Stürmer, Snyder, Kropp, & Siem, 2006; Xu, Kou, & Zhong, 2012); however, two studies, and half of another (Oswald, 1996; Warren & Walker, 1991; Xu, et al., 2012, Study 2) reported a null effect of empathy induction on cooperation.

For studies which found a positive empathy-cooperation link, the method of empathy induction involved: 1) creating a needy situation and perspective taking instructions (cognitive & affective) (Batson & Moran, 1999; Oswald, 2000); 2) a description of suffering transmitted either vocally (Cialdini, et al., 1987), via a story (Allsop, et al., 2002; Pavey, et al., 2012; Stürmer, et al., 2006), or an essay (Eimontaite, et al., 2013). As indicated in Table 2, the majority of those studies, which found a positive link between empathy and cooperation, adopted the first method of empathy induction, that is, presenting participants with a sad story of suffering to induce sorrow or pity towards another. This was a means to encourage participants to behave more cooperatively in the prisoner's dilemma task – a social dilemma task often employed to examine the extent to which people either cooperate or defect (Batson & Ahmad, 2001; Batson et al., 1995; Batson & Moran, 1999;

Rumble, et al., 2010; Xu, et al., 2012). The idea here is that presenting stories of this kind will in turn prime people to have empathic experiences, which in turn are designed to promote cooperation.

For example, Batson and Moran (1999) examined whether empathy induced altruism by providing a negative profile and a perspective taking inducing instruction, with the idea that it would motivate participants to cooperate in the prisoner's dilemma. They found that cooperation was significantly higher in the empathy-inducing condition compared with the non-inducing condition. Moreover, the authors argued that altruism is not simply a type of moral motivation, but actually a distinct form of pro-social motivation. The goal of moral motivation is to uphold a moral principle, but the goal of pro-social motivation is to increase others' welfare (Batson, Klein, Highberger, & Shaw, 1995). This study concluded that empathy-induced altruism leads to cooperative behaviour, which confirmed the empathy-altruism hypothesis that when one has empathy for another in need, the former is altruistically motivated to increase the latter's welfare. Unlike Batson and Moran (1999), Batson and Ahmad (2001) used a sequential (one individual would act first, then the other would act), rather than simultaneous, prisoner's dilemma to address a similar question. Instead of assessing the participants' decisions under the uncertainty of what the other participant would do in the task, the sequential method allowed them to assess whether empathy-induced altruism motivates a person to cooperate in the prisoner's dilemma task, even if participants knew that the target of empathy has defected. The results of this study found that even though people knew their partner in the game defected, empathy was still maintained, and in some cases even increased cooperation.

Likewise, another study (Xu, et al., 2012, Study 1) using the same paradigm examined whether or not empathy promoted cooperation when people explicitly knew the other player would defect, which replicated Batson and Moran (1999)'s results. The study reported that inducing empathy towards a partner maintained cooperation. More to the point, their manipulation of empathy fostered forgiveness towards another that would be likely to defect. Thus, empathy induction towards one individual clearly helped to promote cooperation in the prisoner's dilemma task.

In a similar vein, Rumble, et al. (2010) used an iterated social dilemma task while also inducing empathy, and concluded that empathy has broad benefits for social interaction. "Noise" was introduced in this study; a "noisy" situation in social dilemma was referred to as one in which the intentions or actions of others were uncertain. They believed that empathy could be an effective tool for coping with ambiguous and potentially easy to misinterpret behaviours in others, which plays a key role in the relationship between people, thereby maintaining and enhancing cooperation. As high levels of empathy help individuals to reduce or eliminate the detrimental effects of noise their findings provide good support for this hypothesis. They suggested that empathy increases the positive weight associated with the interaction partner's outcomes, which in turn would likely bring about relatively high levels of cooperation, even when repeated incidents of "noise" challenge the cooperative interaction. Therefore, the empirical evidence supported the claim that empathy maintained cooperation regardless of "noise" situations (Van Lange, 1999; Van Lange & Kuhlman, 1994; Van Lange & Visser, 1999).

In contrast, a number of research studies (Oswald, 1996; Warren & Walker, 1991; Xu, et al., 2012, Study 2) found the ineffectiveness of empathy on cooperation.

For instance, Warren and Walker (1991) manipulated empathy and perceived effectiveness of helping to examine whether this was an efficient way to raise money for charity organizations. The experiment found that the effectiveness manipulations produced significant main effects, whereas the empathy manipulation itself was ineffective. Moreover, Oswald (1996) induced cognitive and affective perspective taking by instructing participants to pay attention to the target thought (cognitive) or feelings (affective), and found that participants in the affective perspective taking condition offered more help than those in the cognitive perspective taking condition and the control condition (i.e. attend to the technical aspects of the videotape, e.g., lighting and sound quality). This study, however, failed to find that the cognitive perspective taking condition offered more help than the control condition. Furthermore, despite the identical experimental methods and procedure, Xu, et al. (2012)'s Study 2 failed to replicate Batson and Ahmad (2001) results.

In summary, several methods of empathy induction were adopted in the research studies in the Category 2. The suffering stories of others plus perspective taking instructions was proved to be the most effective way of promoting cooperation in social dilemma games. It provides evidence that the methodology of inducing empathy is effective in enhancing cooperative decision making in laboratory experimental settings. However, alternative empathy induction methods that required participants to empathize with an agent in a story (story-driven empathy induction) were found to induce unstable effects regarding an empathy-cooperation link. Even when adopting the same empathy induction method by the same research group (e.g., Oswald), one study was found to lead to a positive effect (Oswald, 1996, 2000), but another was not (Oswald, 2002).

Table 2 *Studies included in Category 2: Effect of Empathy (IV) on Cooperation (DV) (E→C) (n=13)*

Record	Study	*N*	% of females in sample	Manipulation of empathy (IV)	Empathy manipulation check method	Measure of cooperation (DV)	Effect of empathy on cooperation	Concepts of empathy	Type of pro-social behavior
720 *	Fultz et al., (1986) Study 1	22	100	Need situation + perspective taking instructions	Self-reported situational empathy (6 empathy adjectives and 8 distress adjectives)	Indicate a willingness to spend time with X	+	8	Helping
	Study 2	32	100	The same as above	Self-reported emotion	Help offered	+	8	Helping
1779 *	Cialdini et al., (1987) Study 1	87	100	"Elaine"- the other participant, who reported problems with electronic shock, would be performing a series of learning trials while receiving electronic shocks	Self-reported focus on how X in the story felt; self-reported focus on objective information from the vignette (indicated on a 7-point scale)	Help offered	+	8	Helping
	Study 2	35	100	Listen to a 5-min "News from the personal slide" tape, which described the plight of Carol Marcy, who broke her legs in an automobile accident	The same as above	Help offered	+	8	Helping
1781 *	Warren & Walker (1991)	2648	NG	Perspective taking manipulation (imagine-self; picture-a-person)	A 5-point scale of empathy	Value of a donation made/ whether participants returned a form expressing their support	0	6	Charity donation (S)
1782 *	Oswald (1996)	65	85	Affective perspective taking (attend to Ron's feelings); Cognitive perspective taking (attend to Ron's thought)	A 5-points scale of affect, cognition, technical aspects of the videotape	Hours offered to help	+ Affective empathy 0 cognitive empathy	8	Helping
496 *	Batson& Moran(1999)	60	100	The same way as Batson (1991)	IFQ	A simultaneous PDG	+	8	Cooperation
1783 *	Oswald (2000)	162	70	Cognitive perspective taking; Affective perspective taking;	IFQ	Hours offered to Help	+/0	8	Helping
1784 *	Allsop et al., (2002)	97	64	Imagine being asked for money by a person who had locked keys in a car	Self-report of empathizing with X from the vignette	Likelihood of complying with a request to help	+	6	Helping
1785 *	Oswald (2002)	109	71	Affective perspective taking; Cognitive perspective taking	Self-report of empathy (7-points scale)	Minutes taken to volunteer to help	+ Affective	8	Helping
1787 *	Sturmer et al., (2006) Study 1	94	0	Story about feeling down about life	Impression Check Questionnaire indexing feelings of compassion, sympathy, and empathic understanding (1-7)	Helping intentions	+	8	Helping
	Study 2	40	58	Story about a lost backpack	The same as above	Help offered with	+	8	Helping

						punishment (i.e. possibility of losing their own money if they don't comply)			
494 *	Rumble et al., (2010)	180	NG	Perspective taking + break up story (Batson, 1991)	IFQ	A PDG variant	+	8	Cooperation
747 *	Xu et al., (2012) Study 1	60	50	Perspective taking + break up story (Batson, 1991)	IFQ	A simultaneous PDG	+	8	Cooperation
	Study 2	60	50	The same as above	IFQ	A simultaneous PDG	0	8	Cooperation
1187 *	Pavey et al., (2012) Study 1	70	42	A short passage of information about a person who had been in a car accident and who consequently could not go to work (adapted from Batson et al., 1997)	IFQ (presented online)	Willingness to help (two questions using 5-point scale)	+	8	Helping
	Study 2	166	82	The same as above	IRI	Pro-social intentions, self-reported pro-social behaviors carried out within a two week period	+ Dispositional empathy-pro-social intentions and behavior;	8	Pro-Social
	Study 3	59	33	A short passage about a woman who was suffering from depression.	IFQ	Willingness to help	+	8	Helping
1795 *	Eimontaite et al., (2013)	38	37	Sympathy-inducing essay (modified from Harmon-Jones et al., 2003)	Self-emotion questionnaire (a list of 36 emotion words and for each work, indicated which "other participant" they had felt it towards)	PDG; TG	+	8	Cooperation

Note. All references referred to in Table 2 are organized by publication year. In addition, PGG: public goods game; PDG: prisoner's dilemma game; TG: trust game; NG: not given; IFQ: Impression and Feeling Questionnaires (Batson, 1991): IRI: Interpersonal Reactivity Index (Davis, 1983). The findings reported are scored simply according to the following: +: positive effect; 0: null effect; -: negative effect. Here, as depicted in Graph C of Figure 2; C3 refers to the total effect of the independent variable (empathy) on the dependent variable (cooperation).

1.3.3. Category 3: Effect of Cooperation (IV) on Empathy (DV) (C→E)

As shown in Table 3, the third approach of exploring the association between empathy and cooperation is to examine the impact of cooperation on empathic reaction, demonstrated in Figure 2D. It is apparent that cooperation here (in Category 3) is referred to as the cooperative contexts, rather than cooperative intention or behaviour, as is the case in Categories 1 and 2. The cooperative contexts here refer to situations in which cooperation is experienced in synchrony (Valdesolo & DeSteno, 2011), such as carrying out tasks together between two people (Greitemeyer, 2013), or imagining a positive interaction or personal contact with another individual (Kuchenbrandt, Eyssel, & Seidel, 2013).

Most of the research studies in Category 3 report that in the cooperative situations or imagining cooperative contact situations, people revealed stronger empathic reactions (Lanzetta & Englis, 1989), which was indexed via autonomic responses or self-reported (Balconi & Bortolotti, 2012a, 2012b; Balconi, Bortolotti, & Crivelli, 2013). Studies measuring self-reported empathy found that empathic reactions were higher in cooperative contexts rather than neutral or non-cooperative contexts (Behrends, Müller, & Dziobek, 2012). Balconi and Bortolotti (2012a) and Balconi, et al. (2013) measured four autonomic responses: facial expression via the both the corrugator supercilious and zygomaticus major muscle, skin conductance response, and heart rate. In these two studies, cooperation was manipulated by different emotional reactions to video clips in which two actors (one male and one female university student) were seated next to each other in a laboratory room. In the cooperative condition, the actors were smiling and happy, while in the neutral emotional condition, the actors maintained neutral expressions throughout their

interactions. Both studies found that a cooperative situation induced a higher empathic response than the neutral condition, such as increased activity of facial muscle movements, specifically zygomaticus major muscle movements. The activity of zygomaticus major muscle movement was found to be a valid measure of empathy in response to external stimuli such as viewing the cooperative interactions of others (Brown, Bradley, & Lang, 2006). In addition, Kuchenbrandt, et al. (2013) carried out a study with three types of conditions, neutral, positive imagined and cooperative imagined. This was designed to provide evidence that responses found were due to positive emotion rather than sense of cooperation. In the neutral condition participants were given a short description of a scenario in which they had contact with a stranger who was looking for a seat in a classroom; in the positive imagined condition, they used the identical description with more information about the terms *pleasant* and *interesting* to specify the tone of the conversation; in the cooperative imagined condition, the description was that both the participant and stranger decided together to get seats from the classroom in the same scenario. The study found that the cooperative imagined condition induced empathy more than the positive imagined and neutral conditions; this was indexed by presenting 15 emotive words from the Impressions and Feelings Questionnaires (Batson, 1991, 1999). These findings suggest that in general, individuals show more empathic reactions, including non-verbal automatic response, self-reported empathic impressions and feelings in cooperative situations, when a smiling interaction scenario or a joint goal scene is taking place.

However, one important point to make is that when individual differences for empathizing ability is taken into account, a more detailed understanding of the impact of observed cooperative interactions is provided. For example, Balconi and Bortolotti

(2012b) found that only high behavioural activation system subjects, measured by the Balanced Emotional Empathy Scale (Mehrabian & Epstein, 1972), were more responsive and empathic when viewing positive cooperative situations.

In summary, research studies in Category 3 investigated the effect of cooperation (cooperative contexts) on empathic reactions, measured by either physical response (e.g., heart rate, skin conductance response and muscle movements), and/or self-report. Overall, such manipulation found that in most cases the more cooperative or positive interacting contexts are, the more likely they are to lead to a stronger empathic response, but that this was influenced by the personality trait of empathy.

Table 3 *Studies included in Category 3: The Effect of Cooperation (IV) on Empathy (DV) (C→E) (n=10)*

Record	Study	*N*	% of females in sample	Manipulations of cooperation (IV)	Measures of empathy (DV)	Effect on cooperation and on empathy
1778 *	Barnett, et al., (1985)	72	50	Excellent interpersonal problem solving and helping skill V.S. excellent figure-perception skills	6-min videotapes of a female undergraduate describing a serious personal problem to an unseen therapist An emotional-response questionnaire adopted from Batson et al., (1983), (a list of 14 adjectives, 6 reflecting feelings of empathy and 8 reflecting feelings of distress)	+
1780 *	Lanzetta & Englis (1989)	40	30	Expectation of cooperation (the cofactor smiling) matched outcome of cofactor expression and observer outcome	SCR and HR measures of autonomic arousal; EMG data from 4 facial muscle regions	+
1162 *	Likowski, et al., (2011)	77	100	Manipulation situation (cooperation situation): it was said that both players would win if the sum of their scores after a certain number of rounds exceed a certain value; if the sum of both players' scores did not exceed this value both would lose	Cognitive empathy: "Reading the mind in the Eye test" (Baron-Cohen, Wheel-wright, Hill, Raste, Plumb, 2001)	+
					Emotional empathy: questionnaire which consisted of 24 items measuring distress, sadness and emotional empathy	0
766 *	Valdesolo & DeSteno (2011)	69	NG	Green and red task (synchrony)	A three-item measure using 7-point response scales: a) sympathy for victim, (b) pity for victim, and c) compassion for victim	+
1793 *	Balconi & Bortolotti (2012)	35	49	Present interpersonal scene types; smiling and happy expressions by two actors for cooperative scenes	Autonomic behaviour (SCR, HR); Personal response to empathic scale (BEES), approach-withdrawal attitudes (BIS/BAS); verbal self-report measures	+
1128 *	Balconi & Bortolotti (2012)	35	52	Create a cooperative setting via smiling and happy expressions for cooperative scenes	Verbal self-report measures (empathic response, emotional involvement and emotional significance and valence); Autonomic responses (facial expression-corrugator supercilii and zygomaticus major muscle, SCR and HR)	+
777 *	Balconi, Bortolotti, & Crivelli. (2013)	35	52	Create a cooperative setting via smiling and happy expressions for cooperative scenes	BEES	+
750 *	Kuchenbrandt, Eyssel & Seidel (2013)	87	52	Manipulating cooperative imagined contact	A list of 15 emotion words (Batson, 1991)	+
1794 *	Greitemeyer (2013) Study1	109	68	Playing video game cooperatively: two participants	The extent to which they felt sympathetic, warm, compassionate, soft-hearted and tender (Batson et al.,)	+
	Study2	85	77	Worked together as teammates	A story about a woman and her four children who live in Bangladesh. The father of the children had died in a work-related accident a year ago. The oldest children (8 years old) had to leave school because the family could not afford the tuition fee	+

1796 *	Stellar et al., (2014) Study 1	90	55	Either an egoistic, cooperative, or control target who disclosed a time of suffering, the death of grandparent	Watching the video about the grandfather's death. 12 other emotions (a 10-piont Likert scale 1 I do not feel this at all; 10 I feel this as much as I've ever felt).	+
	Study2	136	49	The same as above	Face-to-face interaction; Telling story about family dog had passed away	+

Note. All references referred to in Table 3 are organized by publication year. In addition, IRI: Interpersonal Reactivity Index (Davis, 1983); MET-CORE: the Multifaceted Empathy Test (Dziobek et al., 2008); MASC: Movie for the Assessment of Social Cognition (Dziobek, et al., 2006); BEES: Balanced Emotional Empathy Scale; Mehrabian & Epstein, 1972): SCR: skin conductance: HR: heart rate; zygomatic response: the reactions of zygomaticus major muscle as a valid measure of empathy via a happy expression in response to external stimuli; NG: not given. The findings reported are scored simply according to the following: +: positive effect; 0: null effect; -: negative effect. Here C3 refers to the total effect of the independent variable (cooperation) on the dependent variable (empathy), as depicted in Graph D of Figure 2.

1.4. Discussion

A comprehensive systematic review of the methodologies was conducted, developed to examine the association between empathy and cooperation, and the nature of this relationship based on the different approaches taken. Overall, there were three categories of studies. The first category explored the correlation with results mixed regarding reliability. The second category examined the role of empathy induction on cooperation with evidence showing that inducing other-oriented emotions and feelings including sympathy, compassion or pity, lead to a relatively high stable positive effect on cooperative behaviour in the prisoner's dilemma task. The third category of studies showed that manipulating an observed cooperative situation, or taking part in one, can influence empathic responses. More specifically, this was specific to individuals exhibiting greater empathic responses (e.g., increased facial muscles movement) in response to external stimuli.

While the evidence shows some positive association between empathy and cooperation, this systematic review has also revealed that regardless of which category of study there is, the findings are mixed with regards to the reliability of the association between empathy and cooperation. The reasons for this require further discussion. An explanation for the mixed and unstable association between the two might be based on the types of definitions proposed for each phenomenon. With regards to the definition of empathy, in some articles, empathy is referred to as theory of mind (Paal & Bereczkei, 2007), or perspective taking (Oswald, 2000); whereas in some other articles, empathy is referred to as sympathy (Eimontaite, et al., 2013) or empathic concern (McGinley, et al., 2009). Without a clear psychological understanding of the concept being investigated, it is unlikely that researchers can

gain a good understanding of the association between empathy and cooperation. In addition, there are also problems regarding the definition of cooperation, which is considered as synonymous with pro-sociality. When the initial search was conducted in the databases, only studies that self-declared they were studying cooperation were included. However, one concern was that many of the studies treated cooperation as pro-sociality. From a behavioural point of view it may well be the case that cooperation and pro-sociality appear to be one and the same, because both involve doing good things to others. However, if one considers the motivations behind cooperation, and many forms of pro-sociality (i.e. helping, sharing) then these concepts are not exactly the same and should be distinguished conceptually and operationalized differently. Without clearly specifying what constitutes cooperation and how it is distinct from other forms of pro-sociality confusion will remain, and so inferring the precise connection between empathy and cooperation becomes evermore unclear.

1.4.1. Definitions of Empathy

Most of the studies in Category 2 considered empathy as "other-oriented" emotional and feelings' reactions, including compassion, sympathy, pity and sorrow. This is because participants were observing another in need and imagining the person's situation and having concerns over their welfare. Eisenberg (2000) suggested that the content of empathy above, as defined by Batson, should be considered as sympathy. She distinguished between empathy and sympathy, and proposed that empathy should be defined as "an affective response that stems from the apprehension or comprehension of another's emotional state or condition and is similar to what the other person is feeling or would be expected to feel, e.g., a girl sees a sad peer and consequently feels sad, that the girl is experiencing empathy; sympathy, on the other

hand, is an emotion response stemming from the apprehension or comprehension of another's emotional state or condition, which is not the same as what the other person is feeling (or is expected to feel) but consists of feelings of sorrow or concern for the other, e.g., a girl sees a sad peer and feels concerns for the peer, she is experiencing sympathy" (pp. 671-672). Therefore to avoid misunderstanding, due to the definitional confusion of empathy with other constructs such as sympathy, all eight psychological states which have been referred to as empathy in Batson's work (Batson, 2011) are presented. To gain a better understanding of the link between cooperation and empathy, it is important here, to clarify exactly what the studies in the systematic review mean by the term empathy. As mentioned before, inconsistencies revealed in the systematic review may be accounted for based on the lack of precision defining which phenomena are actually being studied.

"1) Knowing another person's internal state, including his or her thoughts and feelings; 2) adopting the posture or matching the neural response of an observed other; 3) coming to feel as another person feels; 4) intuiting or projecting oneself into another's situation; 5) imagining how another is thinking and feeling; 6) imagining how one would think and feel in the other's place; 7) feeling distress at witnessing another person's suffering; 8) feeling for another person who is suffering, which is other-oriented emotion elicited by and congruent with the perceived welfare of someone in need." (Batson, 2011, pp. 12-19)

Thus, an additional column "concept of empathy" is added in Tables 1 and 2 to examine the corresponding psychological state investigated in each study, and then going back to examine the concept of empathy in those references included in the systematic review. The concepts of empathy were categorized either as explicitly

defined in the references or inferred based on the descriptions of empathy. Thus, as seen from Table 1, most Category 1 studies investigated the 8th concept of empathy with the remaining studies examining the 1st, 3rd, 5th and 7th concepts. Studies falling under Category 2 investigated the 6th and 8th concepts of empathy. It is apparent that there are substantial differences between the studies regarding the concept of empathy, however, even when taking the different conceptions into consideration, this does not account for the discrepancies. Of the other factors which might contribute to the mixed findings; the precise meaning of cooperation seems the highest possibility and will be presented in the following section.

1.4.2. Definitions of Cooperation

Although the key word search for "cooperation" was limited in the selective criteria in the systematic review, careful reading of the studies (see Table 2), suggests some were investigating other types of pro-social behaviour which may not specifically be considered as cooperation *per se*; for instance, helping (Allsop, et al., 2002; Cialdini, et al., 1987; Fultz, et al., 1986; Oswald, 1996, 2002; Pavey, et al., 2012; Stürmer, et al., 2006) and altruistic sharing (Warren & Walker, 1991) are similar to but not identical to cooperation (Batson & Moran, 1999; Eimontaite, et al., 2013; Rumble, et al., 2010; Xu, et al., 2012). The same issue applies to studies classified under Category 1. The evidence from Category 1 and Category 2 deal with cooperation as either cooperative intention or behaviour, whereas the studies under Category 3 considered cooperation in the cooperative context itself. The findings in Category 3 were not generally considered to make a big contribution to the association between empathy and cooperation, because the cooperative context is simply manipulated by imagining positive-person contact or experiencing synchrony.

This is rather different from common definitions of cooperation, which will be defined later. However, the studies under Category 3 are still an essential and critical part of the conceptual understanding of the association between empathy and cooperation. Despite the importance of Category 3 studies, studies under Categories 1 and 2 studies are also of central interest for researchers because the cooperative tasks studied are treated as more typical of cooperative behaviours.

As mentioned, the second issue revealed in the systematic review is that cooperation (in Categories 1 and 2) is considered as synonymous with pro-sociality, and other types of pro-social behaviour. So what exactly does cooperation mean here? Is cooperation the same as helping, or charity donations? Generally cooperation, helping and sharing are all referred to as examples of pro-social behaviours (Marcus, 1991). Pro-social behaviour refers to voluntary actions that are intended to benefit another individual or group of individuals (Eisenberg & Mussen, 1989). Altruistic behaviours are those pro-social behaviours motivated by other–oriented intentions or moral concerns and empathy (Eisenberg, 1986), sometimes at a cost to oneself; though not all pro-social behaviours are altruistic behaviours. Altruism is a motivational state with the ultimate goal of increasing another's welfare, though from Batson's perspective, altruism does not necessarily require self-sacrifice. Egoism is a motivational state with the ultimate goal of increasing one's own welfare (Batson, 1991). Therefore, pro-social behaviours may result in the same outcome but crucially the underlying motivations for the behaviours can either be altruistic or egotistical.

In general, cooperation tends to be defined according to the relationships between members of a group. One approach is to focus on the individual's role within a group. If cooperation is considered from the perspective of an individual within a

group, the definition of cooperation is behaviour that benefits the group or collective, often at the cost of individual benefits (Irwin, et al., 2008). For example, Hinde and Groebel (1991, p. 27) refer to cooperation as "behaviour intended to benefit a group at a cost to an individual". Another way to define cooperation is to focus on the relationship between the relevant parties (i.e. individuals, groups, institutions), such as joint behaviour that is directed toward a goal in which the participants gain equal rewards (Marwell & Schmitt, 1975). If one considers cooperation from the perspective of the relationship between individuals, then cooperation should be referred to as behaviour that involves a shared goal. Ideally, two persons perform interdependent roles (the actions of each influence the other's gains or losses) directed by a shared goal. In addition they possess the motivation to mutually support each other's action to reach that goal; this always involves activities with shared goals and shared intentions (Derlega & Grzelak, 1982; Liebal, Colombi, Rogers, Warneken, & Tomasello, 2008; Warneken & Tomasello, 2007). However, there is a possibility for joint action based on motivations that are egotistical; because it is not necessary for there to be a shared underlying intention, even though the goal is shared. For this definition, the key feature for cooperation is that the relationship between individuals is interdependent.

Based on the distinctions drawn from the relationship between individual to group and the relative gains, how helping differs from cooperation on the basis of the relationship between two parties should be considered (Derlega & Grzelak, 1982; Marwell & Schmitt, 1975). Helping is considered as behaviour in which the helper must understand the other's unachieved goal and other's intention. If motivated by altruism, this would be when one is directed to perform a voluntary action in a situation in which the helpee is dependent on the helper. Derlega and Grzelak (1982)

argued that what distinguished helping from cooperation are the nature of the jointly determined costs and benefits rather than the nature of the dependence relation. Cooperation involves mutual rewards (material/external rewards to distinguish helping from cooperation) and mutual costs. In contrast, in helping situations the reward is experienced by the helpee alone, and the costs (and decision control) by the helper alone. In addition to helping, cooperation is also confused with sharing, but this too is distinct from cooperation. Based on the definitions of cooperation and helping, sharing is referred to as a voluntary action motivated by altruism; however, the sharer does not need to understand the other's goal and intention, whereas they should do in cooperative situations. Table 4 presents the distinctions between cooperation, helping and sharing. From behavioural perspectives, sharing, helping and cooperation are all "give-some" behaviours (Komorita & Parks, 1994).

Table 4 *The Distinctions among Sharing, Helping and Cooperation*

	Behaviour	Cognitive Process	Motivation	Relation of parties
Cooperation	Giving and Gaining	1. Both know the other's intention and goal 2. Both know they will gain from the joint goal	Self-concerns/Egoism; Altruism	Interdependent
Helping	Giving, Potentially gaining	1. The helper understand the helpee unachieved goal 2. The helper knows the helpee need	Other-concerns	The helpee is dependent on helper
Sharing	Giving	No necessary understanding of the others' goal/ intentions/needs	Other-concerns/ Altruism	Independent

1.4.3. Measures of Cooperation

Along with providing conceptual clarification of cooperation, cooperation was considered as a dependent variable, and so the measure of cooperation discussed, with

many studies using classic social dilemmas tasks (R. M. Dawes, 1980), and others involving the use of self-report questionnaires (see Table 5).

Table 5 *Measurements of Cooperation as a Function of the Definition of Cooperation*

Definitions of Cooperation	Measures	
1 (within a group)	Public Goods Game (Batson, Batson, et al., 1995);	Cooperative Behaviour
2 (two parties)	Prisoner's Dilemma (Van Lange, Ouwerkerk, & Tazelaar, 2002); Ultimatum Game (Sally & Hill, 2006);	Cooperative Behaviour
1&2 (within a group & two parties)	social cooperation scale of Cloninger's Temperament and Character Inventory test (Cloninger, Przybeck, & Svrakic, 1994; Paal & Bereczkei, 2007); organizational citizenship behaviour (C. A. Smith, Organ, & Near, 1983)	Cooperative Intention

The most widely used behavioural paradigms are in the domain of social dilemmas, including the prisoner's dilemma and variations of it (Batson & Ahmad, 2001; Batson & Moran, 1999; Rumble, et al., 2010; Xu, et al., 2012), and the public goods game (PGG) (Batson, Batson, et al., 1995). The classic paradigm of the prisoner's dilemma is derived from prisoner confession stories. To detect the relation between empathy and cooperation, there are several variants of the prisoner's dilemma game which measures cooperation, and a simultaneous variant of prisoner's dilemma (card given) (Batson & Moran, 1999) is one of them. In their variant, each participant received three cards (two +5 and one -5 cards). There were four outcomes (+5/+5; +5/-5; -5/+5; -5/-5), which the payoffs of outcome match the payoff matrix of the classic prisoner's dilemma task. In this card game variant of prisoner's dilemma the operational definition of cooperation is giving a +5 card in each experimental condition. It is worthwhile mentioning that the interactive paradigm of Van Lange and Visser (1999), another variant of prisoner's dilemma, allows participants to decide

how many coins to give away to the partner, which could also be construed as a method of examining degrees of cooperation.

There are also several variants of the PGG; one example of it (Batson, Batson, et al., 1995) is as follows. Initially, each participant would receive 16 raffle tickets in two 8-ticket blocks; each ticket was good for one chance of winning a $30 gift certificate at the store of the winner's choice. For each block, the participant could keep the 8 tickets (all or none) for him- or herself, give them to another participant, or give to the group as a whole. In addition, they were told that the more raffle tickets they ended up with; the more chance they have of winning a gift certificate. The participant would play the game and then simply be informed of the final number of tickets he or she received, but without knowing other participant's individual allocation decision. If the tickets were given to the group as a whole, those tickets were given 50% extra, and then divided equally to each of the participants. In this experimental setting, participants were placed with the conflict of self-interest, other-interest and collective interest. According to the first definition of cooperation, it refers to the conflict between self-interest and collective interest. Thus, the operational definition of cooperation is to give the raffle tickets to the group.

Cooperation is therefore defined as behaviour that benefits the group or the collective, often at the cost of benefit to the individual (Irwin, et al., 2008). This perspective is to measure the intragroup cooperation, for which the common measures are PGG and the common resource paradigm. Alternatively, there is another perspective in considering cooperation as joint behaviour that is directed toward a goal in which the participants gain equal rewards (Marwell & Schmitt, 1975). This definition of cooperation is more likely to measure dyadic cooperation, with the most common measures being the prisoner's dilemma and ultimatum game. The prisoner's

dilemma game studies dyadic cooperation and the PGG examines multi-person cooperation. In summary, social dilemma tasks are the primary measure of adults' cooperative behaviour. Social dilemma tasks generally require participants to make decisions in a scenario, sometimes decisions are associated with the payoff; while self-report questionnaires (e.g., The social cooperation scale of Cloninger's Temperament and Character Inventory Test and organizational citizenship behaviour questionnaires) are based on participants' self-report which can lack real costs. In this case the measure of cooperation are intentions to cooperate, as indicated in Table 5.

The main focus of the discussion here has been on studies that fall under Category 1 and 2, for which there is some overlap regarding methods for studying cooperation and the definitions of cooperation. Studies falling under Category 3 are rather different from the other two categories because they concern manipulations of cooperation rather than measures of cooperative behaviour *per se*. For this reason the measures of cooperation are not discussed further for Category 3, though the research approach taken for studies under this category provide a novel way of examining the association between empathy and cooperation.

Considering the different conceptual issues regarding empathy and cooperation, along with the measures of cooperation, as highlighted, it is worth now considering this as a possible explanation of the mixed findings in the studies included in the systematic review, Therefore, distinguishing cooperation from other types of pro-social behaviours and understanding the psychological concepts of empathy (eight concepts in total), the evidence suggests that for those studies that fall under Category 1, the empathy-cooperation link (Paal & Bereczkei, 2007) (1-C) and the empathy-helping (8-H) (Eisenberg, Fabes, et al., 1989; Eisenberg, Miller, et al., 1989) are positive, but the empathy-sharing (1-S) (Edele, et al., 2013) is mixed. For

those studies in the Category 2, empathy-cooperation link (8-C) (Batson & Moran, 1999; Rumble, et al., 2010) and empathy-helping link (8-H & 6-H) (Fultz, et al., 1986; Oswald, 2000) were found positive, but the empathy-sharing link (6-S) (Warren & Walker, 1991) was not. In short, Category 1 explores the correlation between empathy and cooperation, with a stable and positive correlation found regarding real cooperation, instead of other types of pro-social behaviours, and empathy as in "knowing another person's internal state, including his or her thoughts and feelings". Moreover, another stable empathy-cooperation link was found when empathy refers to "feeling for another person who is suffering. This is other oriented emotion elicited by and congruent with the perceived welfare of someone in need" and is manipulated as an independent variable.

The limitations of the present systematic review are that it only includes English language publications, and does not include unpublished empirical data (Rothstein, Sutton, & Borenstein, 2006). In addition, only "empathy" and "cooperation" were used as the key words when searching through the databases. A broader search including terms such as "sympathy", "compassion", and "perspective taking" might help to obtain thoughtful and complete studies; however, such a broad search would add to the conceptual problems that already exist regarding the terms empathy and cooperation. Despite these limitations, this systematic review still provides an evaluation of the evidence that seeks to explore the association between empathy and cooperation, and highlights that more work needs to be done to establish the reliability of the precise relation between empathy and cooperation. Specifically, the systematic review helps to distinguish amongst those forms of pro-social behaviours and point out the current mixed use of relevant concepts (e.g., pro-sociality, cooperation and helping). This should highlight to researchers that they need

to be more careful with regards to what conceptions of empathy and cooperation they are investigating in future studies. What is more, through experimental design these concepts need to be carefully distinguished in order to lead to successful theory development. For example, measuring cooperation and helping separately, and by manipulating information (i.e. what is revealed) for both players, as well as considering the structure in the prisoner's dilemma from the interdependence/dependence relationship will make it possible to improve on the current state of empirical work. Furthermore, using a variety of measures of both empathy and cooperation in a single study would help to measure not only the effects on cooperation in a PGG, but also the reliance on other measures of cooperative intention (e.g., the social cooperation scale of Cloninger's Temperament and Character Inventory Test (Cloninger, et al., 1994)).

As mentioned thus far no previous review has been conducted that examines the different research approaches designed to investigate the relationship between empathy and cooperation. The aim here has been to highlight key findings, and to show further fruitful areas of inquiry, and to present conceptual controversies.

1.5. Conclusion and Implication for Future Studies

Empathy and cooperation constitute two of the most researched topics in the social and behavioural sciences, spanning more than five decades of theorizing and research. Despite these longstanding efforts, one key question that is essential to theories of empathy and cooperation has not been fully answered, namely: what is the relationship between empathy and cooperation? To date, with the exception of the presented review, there has been no systematic review (or meta-analysis) that has consolidated research insights in order to answer this key question. The systematic

review shows that evidence across three methodological approaches implies an association between empathy and cooperation. More to the point, if studies show that the manipulation of cooperation can in turn impact on empathy, and vice versa, that inducing empathy can increase cooperation, then it may be the case that there is a bi-directional relationship between empathy and cooperation. Another critical problem addressed by this systematic review is that there is a need for conceptual clarification regarding what cooperation is, and how it is distinct from other types of pro-social behaviours (helping, sharing). Most researchers readily agree that the role of empathy is crucial to well-functioning relationships, organizations, and even societies, but the extant literature is far from providing definitive support for this assumption. The endeavour here has been that this systematic review provides a valuable insight for those researchers who show a keen interest in researching the association between empathy and cooperation.

Chapter 2 Theoretical Motivation

The last chapter used a systematic review to present empirical evidence on the association between empathy and cooperation. The aim of this project is to explore the effects of empathy on cooperation, in which empathy is the independent variable and cooperation the dependent variable, as in section 1.3.2 Category 2. Prior to describing a series of empirical studies I conducted to explore this issue, the theoretical backgrounds will firstly be introduced. This chapter presents the theoretical motivations behind the experiments conducted in this thesis and also the way in which the research question of the whole thesis is addressed. The first section introduces the Public Goods Game (PGG) experimental paradigm and its rationale; the second section presents the theories and models that explain why people cooperate within groups; the third section discusses the motivations of cooperation in social dilemma; the fourth section contains a discussion on the theories concerning empathy-cooperation link; and the final section outlines the four studies conducted in the empirical section of this thesis and their theoretical connections with relevant theories introduced in the second and fourth sections.

2.1. PGG and its Rationale

In Chapter 1, the systematic review provided an evidence-based analysis on the clarification of definitions. The conclusions suggested that the experimental paradigm used in research plays a critical role in determining the addressed research problem and operational definition. As discussed in Chapter 1 and according to other review work (Eisenberg & Miller, 1987), the mixed findings in previous studies are due to the diversity of experimental tools, as well as the various different and misaligned conceptions of empathy and cooperation. Therefore, to enable a better and

clearer comparison with previous studies, the series of studies within this thesis consistently adopted a typical experimental paradigm, a linear public goods game (PGG). Given its roots in game theory, the PGG was selected because it not only meets all the requirements of social dilemmas, but also provides a precise way of examining cooperative behaviour in a group setting. Social dilemma games consist of two key characteristics: a) at any given decision point individuals receive higher payoffs for making selfish choices than they do for making cooperative choices (regardless of the choices made by those with whom they interact); and b) everyone involved in the game receives lower payoffs if everyone makes selfish choices than if everyone makes cooperative choices (R. M. Dawes, 1980). Unlike another widely studied economic game, the prisoner's dilemma, PGG enables researchers to explore cooperative behaviour within small groups and provides a continuous response instead of a binary choice. Although these two experimental paradigms are distinctive, researchers have argued that they are connected to a certain degree. The prisoner's dilemma is considered as a special case of the PGG in which two players make a binary choice: contributing nothing (i.e. defect) or contributing everything (i.e. cooperate) (Fehr & Fischbacher, 2004). Each player in the prisoner's dilemma is better off if he defects regardless of what the opponent does. However, Fehr and Fischbacher (2004) highlighted that in the PGG, the collective rational choice is to contribute everything on each round (i.e. full cooperation). This is because if all players defect (keep their all tokens in each round), they only keep what they started with. If, however, all players cooperate on each round (contribute their full endowments), their overall income is significantly greater than their endowment on each round. The connection of these two types of social dilemma provides a valid reason for selecting the PGG as the experimental paradigm of choice in this thesis.

The final reason for selecting the PGG is due to the broad range of investigations it enables. Due to such practical applications, the PGG is not only used in psychology, but also in other disciplines such as sociology, biology and economics (Komorita & Parks, 1995). Thus, consistently adopting the PGG across the studies in this thesis provides an opportunity for multidisciplinary applications. In summary, strong mathematical roots, a typical representative social dilemma paradigm, a continuous response, and a cross-disciplinary application lead to the selection of the PGG as the experimental paradigm for use in the thesis.

In the public goods problem an individual's incentive is at odds with the group interest. While this conflict has received attention, over several decades, from a number of aforementioned disciplines (Fehr & Gächter, 2000; Fischbacher & Gächter, 2010; Kroll, Cherry, & Shogren, 2007b; Ledyard, 1994; Rapoport & Suleiman, 1993), it was first investigated by economists (Lindahl, 1919) in 1919. Economist Samuelson (1954) conjectured the problem, and later Ledyard and Roberts (1974) discussed the PGG in detail, including describing a typical experiment, exploring the fundamental question of the PGG and identifying factors increasing cooperation. The initial discussion on the issue by economists inspired political scientists to pay attention to the problem of collective action (Olson, 1965) followed by Sociologists (Marwell & Schmitt, 1975). After publication of an annual review concerning social dilemma by the social psychologist Dawes (R. M. Dawes, 1980) psychologists joined the discussion. The public goods problem drew the attention of these researchers due to its direct real life application to help solve social problems and guide policy making. There are many example of use of the PGG paradigm in 'everyday' settings, ranging from paying taxes (Uler, 2011), voting (Kroll, et al., 2007b), to contributing to keep the National Public Radio on the air (Attari, Krantz, &

Weber, 2014). The greatest challenge to the PGG is free riding. Free riding refers to individuals who always pay out none or less than the average contribution of others (Andreoni, 1988), which leads to the non-production or underproduction of a public good.

Many variants of the PGG were generated and adopted in order to meet a variety of researchers' needs. So far, studies of cooperative behaviours typically use either the linear (continuous) (Fehr & Gächter, 2000; Ledyard, 1994; Zelmer, 2003) or discrete (step-level) (De Cremer, 2007; Rapoport & Suleiman, 1993) version of the PGG. For the linear PGG, the value of the public good varies directly with the total amount contributed by the group members; whereas in the step-level PGG, there is a provision point such that the public good provided is all-or-none if the total amount contributed exceeds the provision point (Komorita & Parks, 1995). The present thesis uses the linear PGG rather than the step-level PGG because the step-level PGG measures coordination and the linear PGG measures cooperation, as noted by Abele, Stasser, and Chartier (2010).

In typical linear PGG games players are endowed with 20 tokens in each of 10 rounds, and they must choose to contribute anything from 0-20 tokens per round. After each player makes a decision, the group pot will be multiplied by a certain number and then all tokens in the common pot divided evenly irrespective of the player's initial contributions. The mathematical equation shown as *Equation 1* is adopted from (Fehr & Gächter, 2000).

$$\pi_i = y - g_i + a\sum_{j=1}^{n} g_i$$

$$0 < a < 1 < na \qquad (1)$$

Here π_i is the monetary payoff for the participant i is one round, a is the marginal per capita return from a contribution to the public good, g_i refers to the contribution to the group pot. In each round each of the n participants in a group receives an endowment of y tokens. A participant can either keep these tokens for him- or herself or invest g_i tokens ($0 \leq g_i \leq y$) into a project. The decisions about g_i are made simultaneously. In the present thesis, there are 10 rounds, 4-player or 2-player groups (n = 4 or 2); with a being equal to the factor by which the pot is multiplied divided by the number of players.

The rationality for the one-shot game and iterated game of the linear PGG are different. The operational definition of cooperation in the PGG is the amount of contributions in the common pot (g_i). There is only one Nash equilibrium for the one-shot PGG, which is to contribute zero ($g_i = 0$), a self-defeating dominant strategy (Abele, et al., 2010). According to empirical studies (Ledyard, 1994), most people typically contribute 40% ~ 60% of their endowments in the one-shot linear PGG, or the first round in the iterated game. However, the optimal strategy for the iterated linear PGG is still unclear and controversial. For the iterated version, the behaviour of some people may approximate the *tit-for-tat* strategy for repeated interaction with the same individual (Nowak, 2006), which is a matching strategy that involves mimicking what opponents do in the previous round. The standard *tit-for-tat* strategy is usually defined and interpreted for repeated two-player games with binary pure responses (cooperate or defect). Throughout the whole thesis, the matching strategy in the PGG is a *generalized tit-for-tat* strategy, that is, the main observed pattern is that people adopt a simple strategy that tracks the behaviour of others. In other words, they adopt the so-called “Golden Rule” - “Do unto others as they have done unto you”. However, is this the whole story? The answer is, not quite. On iterated versions some

individuals, characterized as unconditional free riders, start by contributing nothing, regardless of how the other opponents behave, and maintain this strategy throughout all the PGG rounds (Fischbacher, Gächter, & Fehr, 2001). However there are some individuals, referred to as unconditional co-operators, who contribute everything regardless of their opponents' responses (Nowak & Sigmund, 1993).

2.2. Theories concerning Human Cooperation

Theoretical work (H. H. Kelley & Thibaut, 1978; Tyler, 2010; Weber, Kopelman, & Messick, 2004) in the area of human cooperation appears to be focused on the question, *why do people cooperate?* The question concerns fundamental issues regarding what the appropriate strategy is in repeated social dilemma games, and as discussed in the previous section, are there different ways of conceptualizing what the optimal strategy is with regards to maximizing personal gain, and maximizing the overall gain of the group? The discussion that follows considers the different theoretical approaches to address this question. Four different disciplines have developed theories to address these questions, namely evolutionary biologists, economists, sociologists and psychologists, and these will be discussed in turn, with a particular focus on the psychological work in the domain of cooperative behaviours.

Evolutionary biologists suggest that cooperative behaviours have evolved through natural selection by kin selection, direct reciprocity, indirect reciprocity, network reciprocity and group selection (Deng & Chu, 2011; Hauert, Holmes, & Doebeli, 2006; Nowak, 2006; Sachs, et al., 2004; Sigmund, 2009; Tomasello & Carpenter, 2007). Kin selection, also called inclusive fitness, suggests that genetic relatedness will favour cooperation (Dawkins, 1976) and this claim was developed to explain why relatives cooperate with each other more than with strangers. Direct reciprocity refers to cooperation occurring due to repeated encounters between the

same individuals, even strangers, as they too cooperate in some circumstances. Indirect reciprocity occurs when the relationship between the actor and the recipients is asymmetric and therefore direct reciprocity is impossible. This indirect reciprocity is a means of establishing a good reputation within a new social group. Network reciprocity refers to cooperation within one's own spatial network (e.g. neighbours) with clusters of co-operators outcompeting defectors. Group selection is the idea that competition is not only between individuals but also between groups, for example, pure cooperator groups might grow faster than pure defector groups. The five mechanisms from an evolutionary perspective to explain why people cooperate in five different possible types of situations (genetic relatives, two repeated interacting individuals, social acquaintances, co-operators networks and group relations), which helps us to clearly understand the evolution of cooperation. In summary, evolutionary biologists focus on the ultimate distal mechanisms that support fitness or reproductive success outcomes, which is informed by an evolutionary mechanism based on repeated interactions with strangers. This in turn provides a guide for analysing the *generalized tit-for-tat* strategy.

Economists claim that expected utility/rational choice models (Elster, 1986; Pruitt & Kimmel, 1977) are concerned with maximizing personal utility, while the inequality aversion model (Fehr & Schmidt, 2000) involves other-regarding preference concerns for fairness and reciprocity. The expected utility/rational choice model presumes vigilant, calculating decision makers who assess choice environments with care, determine the probable utility (e.g., payoff) associated with each possible choice, and then choose to maximize their expected utility. One issue with this is that many rational choice models struggle to account for actual evidence of cooperative behaviour because they tend to predict that people will maximize their

own utility at the expense of the group (Colman, 1995; Ch 9). Thus, one way in which rational choice theory is problematic is the default expectation that all other players will behave rationally, that is, all members will maximize personal wealth, and does not necessarily show cooperative behaviours. What the evidence suggests, however, is that people make decisions in social dilemma games that are based on incomplete information, errors, and more importantly, on concerns for the welfare of others. Therefore, where empirical data cannot be fully explained and predicted by the rational choice model, the inequality aversion model (Fehr & Schmidt, 1999) is proposed as an alternative model which makes reference to other-regarding preferences. The inequality aversion model, motivated by psychological evidence on social comparison and loss aversion (Kahneman & Tversky, 1979), suggests that people resist inequitable outcomes between their opponents' payoffs and their own payoffs (Fehr & Schmidt, 1999). In most cases, the standard self-interest model (expected utility/rational choice model) is unambiguously refuted; however, in other situations (e.g., ultimatum game, PGG with punishments), the predictions of the inequality aversion model seem to be more accurate.

While economists were dealing with a variety of experimental economic games investigating cooperation and models predicting cooperative behaviour, sociologists sought to explain why people show cooperative behaviours at a societal level (Simpson, 2004, 2006; Simpson, Willer, & Ridgeway, 2012; Willer, 2009b). For instance, the status theory of collective action, proposed by Willer (2009b), emphasizes the role of status in motivating group members to overcome the temptation to free ride, as well as promoting a fear of inefficacy. This theory claimed that cooperation with public goods (collective action) earns an individual improved

status and this standing in turn motivates individuals further to show cooperative behaviours (Willer, 2009b).

Within social psychology, there are several theories that have attempted to explain the social-cognitive mechanisms that underpin cooperative decision-making. Unlike evolutionary biologists, economists and sociologists, social psychologists are interested in identifying the motivations that are the antecedents of cooperation, exploring the motivations that shape the degree to which people cooperate with others and the personal and situational factors that impact cooperation choice (Van Lange, Joireman, Parks, & Van Dijk, 2013). Two main approaches will be considered in depth: resource-exchange based theories and identity-based theories. With regards to resource-exchange based theories, the fundamental idea is based on the fact that people exchange their resources to maximize their own materialistic benefit and to minimize cost (economic motivations). Two theories that fall under this category are the interdependence theory (H. H. Kelley & Thibaut, 1978) and the social-value emotion framework of pro-sociality (Keltner, Kogan, Piff, & Saturn, 2014). With regards to identity-based theories, the fundamental idea is that people behave cooperatively in order to obtain group identity within their community. Thus the incentives of individuals to cooperate are social motivations rather than economic motivations. The theories that fall under this category are the group engagement model (Tyler & Blader, 2003) and the appropriateness framework (Weber, et al., 2004). Each of these theories will be described in the following section.

2.2.1. The Interdependence Theory and associated theories

The interdependence theory, derived from game theory, provides a comprehensive account for interaction and relationships by delineating the ways in which social situations shape both intrapersonal and interpersonal processes. It

presents a logical analysis of the structure of interpersonal situations, advances a taxonomic model of situation, that is, a functional analysis of the structure of the social situations interacting people encounter. It connects types of situations to the particular types of goals and motives that are relevant to dealing with situations. (Rusbult & Van Lange, 2003) The interdependence theory, proposed by H. H. Kelley and Thibaut (1978) assumes that the structure (e.g., the payoff structure), partners (A and B), and dynamics (e.g., the strategy) of interaction jointly determine the interdependent interaction. The interdependence theory is derived from game theory, and it assumes that decision makers transform the *given* matrix to the *effective* matrix, with the *effective* matrix closely linked to their behaviour. The transformation process may involve a redefinition of the choices and/or a shifting of evaluative criteria (H. H. Kelley & Thibaut, 1978, p. 17). Each person's matrix, (*given* matrix and *effective* matrix) is determined by the relative magnitudes of: the direct control over their own outcomes (*reflexive control*), the direct control over their outcome by their partner (*fate control*), and the two person's joint control over their outcomes (*behaviour control*). This theory was suggested as a broad theoretical framework that helps understand the interdependence structure (what a situation is about) and transformations (what people might make of a situation).

The interdependence theory was later developed by Van Lange (1999) into the integrative model of social value orientation, and further developed by Parks to form Parks' Integrated Model (C. D. Parks, Joireman, & Van Lange, 2013). As shown in Figure 3, the central part of the Parks' Integrated Model is the *given matrix* (features of the decision self), *effective matrix* (personal histories, culture, evolutionary motives, and immediate social situation), and the transformation process, which are the basic ideas of the interdependence theory. The integrated model combines the

basic tenets of Kelley and Thibaut's (1978) interdependence theory, and develops it by taking into account individual differences (e.g., social value orientations), and cultural influences and factors moderating response to outcomes. Social value orientation describes a person's preferred pattern of outcomes for participants in a mixed-motivation situation, and how she/he tends to characterize (or transform) the interpersonal situation (Van Lange, Agnew, Harinck, & Steemers, 1997). The model assumes that the *effective matrix* can affect a decision maker's intention to cooperate via perceived consequences or decision rules.

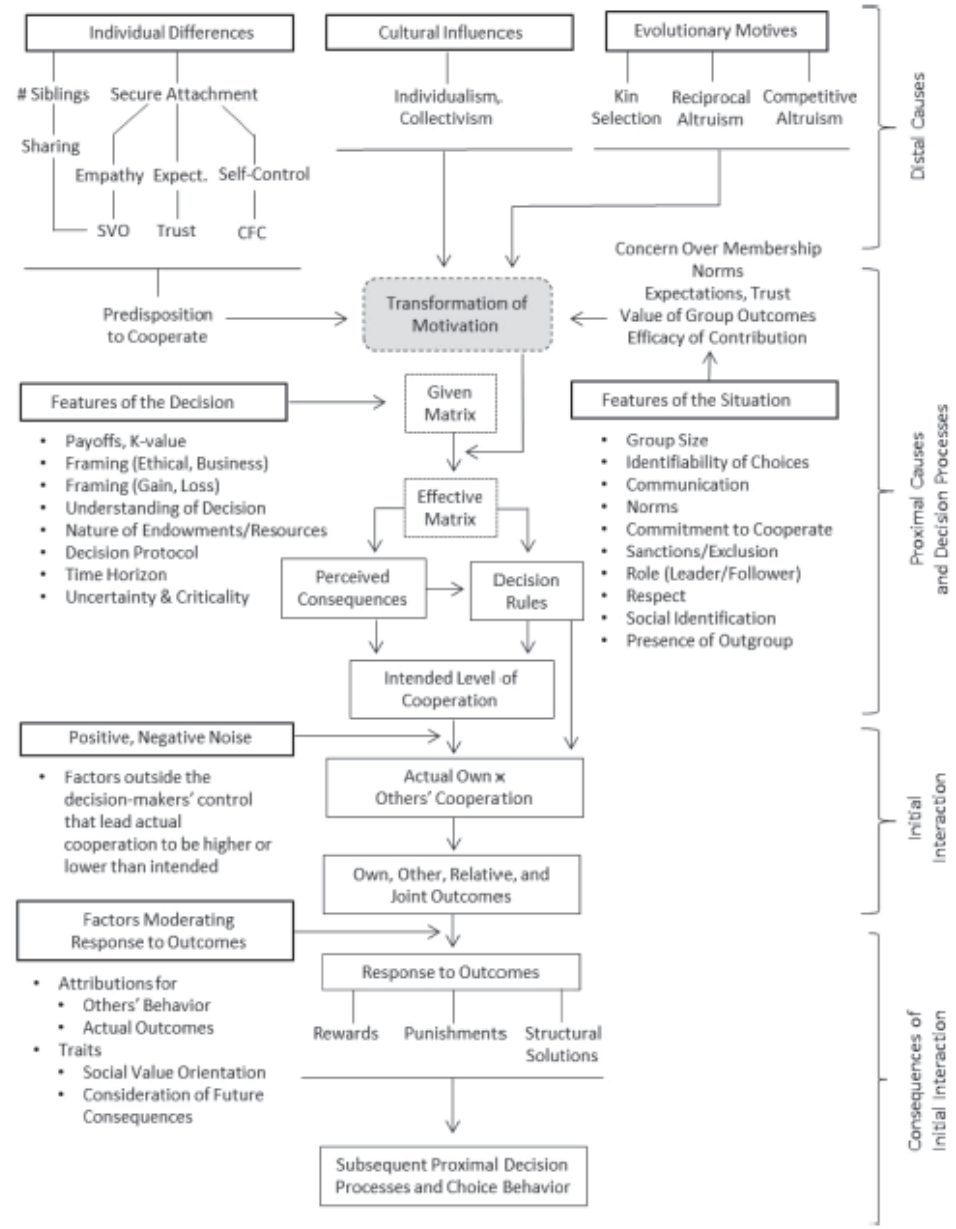

Fig. 5. Integrative model of decision making in social dilemmas. SVO = social value orientation; CFC = consideration of future consequences.

Figure 3. The integrative model of decision making in social dilemma adopted from (C. D. Parks, et al., 2013)

2.2.2. The Sociocultural Appraisals, Values and Emotions (SAVE) Framework of Pro-sociality

Unlike the interdependence theory and its follow-up theories, an alternative focus has been to consider cognitive processes in social dilemma decision making. The social appraisals, values and emotions theory is a comprehensive framework that

explores the psychological mechanism of pro-sociality, including but not limited to cooperation, as noted in section 1.4.2 Definitions of Cooperation. The central ideas of both theories are resource exchange. Keltner, et al. (2014) focused primarily on the factors that affect people acting in a positive manner towards others even, in some cases, at the expense to themselves. As shown in Figure 4, under this framework, the focus is to explain the balance of cost and benefits when acting pro-socially. If the cost of action is larger than the benefits, and the cost of inaction, then the pro-social behaviour (such as acting cooperatively) is likely to occur. M in Figure 4 refers to social momentum for acting pro-socially. This represents the degree to which the individual's sociocultural milieu encourages or discourages pro-social behaviour and is largely affected by cultural factors, e.g., social norms and cultural value. D is the default, which captures individual differences in pro-sociality and situational factors that characterize the immediate social context and make pro-social behaviour more or less likely. K is the modifying factor, which captures the giver's biases and perceptions of the specific recipient (negative or positive biases). B_{self} is the perceived benefit to the self of acting pro-socially; $B_{recipient}$ is the perceived benefit to the recipient of a particular pro-social act; $C_{inaction}$ refers to the cost to self for not acting pro-socially; C_{action} refers to the cost to self for acting pro-socially. This framework focuses on individual-level appraisal processes that give rise to pro-social action, but it also models how dyadic, group and cultural factors further shape this cost-benefit analysis.

$$\mathbf{M} \times (\mathbf{D} \times (1 + \mathbf{B}_{\mathbf{self}}) + \mathbf{K} \times \mathbf{B}_{\mathbf{recipient}} - \mathbf{C}_{\mathbf{inaction}}) > \mathbf{C}_{\mathbf{action}}$$

Figure 4. The sociocultural appraisals, values and emotions (SAVE) framework of pro-sociality adopted from (Keltner, et al., 2014)

In summary, what is clear from the models that fall under the category of resource exchange approach theories is that materialistic or economic cost-benefit analysis is the core factor that motivates people to behave pro-socially, including, specifically, cooperative behaviours.

2.2.3. The Group Engagement Model

The two theories mentioned above stress the economic motivations of acting cooperatively from the resources exchange perspective. The following models argue that there are social motivations that can supplement economic motivations in securing intragroup cooperation. The group engagement model focuses on addressing why people cooperate in groups, such as companies and institutions. Therefore, unlike the interdependence theory focusing on the decision-making in social dilemma, the group engagement theory not only provides theoretical accounts on the social dilemma problem, but also stresses the group identification process and the sense of collective/group identity. The group engagement model highlights the coexistence between individual and group, while interdependence theory and the SAVE framework emphasizes the individual level, specifically at the level of the individual cognitive processes involved in cooperative behaviour.

The group engagement model (Tyler & Blader, 2003) assumes justice motivates pro-social behaviours. Specifically it explains why *procedural justice* shapes cooperation in groups, organizations and societies, and implies that procedural justice influences cooperation through social identity. *Procedural justice,* one of the three primary arenas of justice research (distributive justice, procedural justice and retributive justice), is the study of people's subjective evaluations of the justice of procedures (whether they are fair or unfair, ethical or unethical), and otherwise accord with people's standards for fair processes in social interaction and decision making

(Schroeder & Graziano, 2015, p. 551). This model draws together the insight of the group-value model of procedural justice (Lind & Tyler, 1988) and the relational model of authority (Lind & Tyler, 1992) and extends them to explain the antecedents of cooperation in groups (Tyler & Blader, 2001). Social identity theory argues that to the degree that people think of themselves in terms of group membership, they are drawing their identity from the group; and also argues that when people identify more strongly with a group, they will be more willing to act cooperatively in that group—investing their time and energy in working to see the group succeed. The group engagement model extends the social identity theory, and develops the contents of identity (identification, status judgment) into three aspects: *identification*, *pride*, and *respect* (Tyler, 2010, p. 39), as shown in Figure 5. *Identification* refers to the degree to which people merge their sense of self with the group; *pride* refers to judgments about the status of the group, expresses people's view about the status of the group in a large context, and is indexed by measures of group prestige (Mael & Ashforth, 1992); *respect* reflects judgments about one's status within the group and expresses people's views about their status in the eyes of other group members (Tyler, 2010). Why does identity encourage cooperation? From an identity perspective, people act cooperatively, at the expense of their self-interest, because they have merged with others, so that self-interest and the interest of others are intertwined. Hence they think of the group interest as their own interest (De Cremer & Tyler, 2005). Procedural justice within groups influences the identification judgement and this in turn influences cooperation. The model makes the key claim that people focus on procedural justice and it is this that sheds light on their motivations for engaging in groups. This model explicitly posits what these motivations are, that is, the argument underlying the group engagement model. This model is more focused on cooperative

behaviour in groups rather than specifically addressing social dilemma problems, although the same logic, in theory, can be extended to be able to explain behaviour in social dilemma problems.

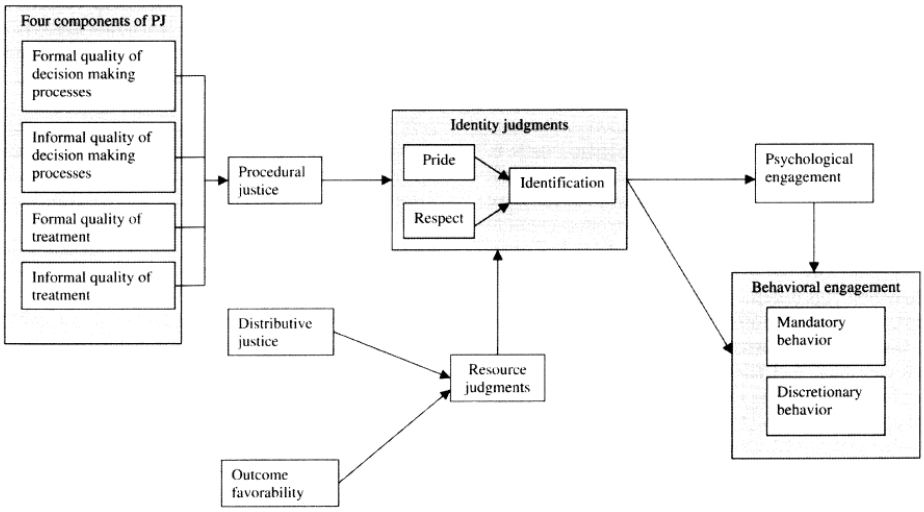

Figure 1. The group engagement model.

Figure 5. The group engagement model adopted from (Tyler & Blader, 2003)

2.2.4. The Appropriateness Framework

The group engagement model stresses the role of identity on intragroup cooperation. Likewise, the appropriateness framework considers identity as one of three key concepts determining choices in group contexts. Similar to the interdependence theory, the appropriateness framework is particularly interested in decision making in social dilemmas. The "identity" in the group engagement model is more like group identification (group membership) - "How strongly do I belong to this group"; whereas the "identity" in the appropriateness framework is the perception of self, and does not necessarily link to a group *per se* but other individuals in the group - "What does a person like me?" Despite this gap regarding the definition of identity, the perception of self in most cases contributes to group identification, especially when the individual and group share similar values (Van Zomeren, Postmes, & Spears, 2008).

Unlike the interdependence theory and the SAVE framework, based on the logic of consequence, the appropriateness framework (Weber, et al., 2004) is based on the logic of appropriateness (March, 1994). Weber and colleague's (2004) framework aims to answer the fundamental question; "what does a person like me (identity) do (rule) when they are in the situation like this (recognition)?" (p. 282). As shown in Figure 6, identity (e.g., what does a person like me), recognition of the situation (e.g., in the situation like this) and rule (e.g., how they do) are the three basic factors of determining the decision. The decision maker views the situation through a lens constituted by the interaction between identity and situational cues. *Identity* in the appropriateness framework is "an umbrella concept that includes all the idiosyncratic factors that individuals bring with them into a social situation", including personality factors, such as self-monitoring (Snyder & Gangestad, 1985), social value orientations (Messick & McClintock, 1968), personal history and personal experiences. It is also suggested that the normative constellations of qualities, status, behaviours and values may act as pivotal identity factors in social dilemmas. The recognition of the *situation* involves matching features of the situations encountered to features of other situations that are already (at least partly) understood or previously experienced; i.e. unexpected strange behaviours, uncertainty, attributional ambiguity, or novel contextual information which leads to greater difficulty in recognizing the situation based on prior experiences. *Rules* include explicit and codified guidelines for behaviour (e.g., codes of ethics or laws), less visible and/or potentially explicit influences of social heuristics (e.g., women and children first) and habitual rituals (e.g., the equal division of resources). Economic utility maximization is only one of the possible decision rules that may apply in a social dilemma situation.

In summary, the psychological theories mentioned above focus, on the one hand, on the cost-benefit analysis (the interdependence theory and the SAVE framework), while on the other hand, they stress the importance of identity and rules (e.g., justice in the group engagement model, economic utility maximization in the appropriateness framework). All these four theories or frameworks cover both social motivations and economic motivations, but place different weight on these two aspects.

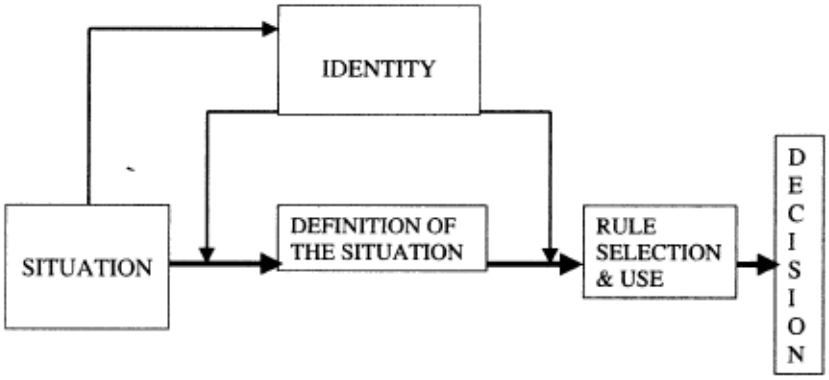

Figure 1. A schematic representation of the appropriateness framework.

Figure 6. The appropriateness framework adopted from (Weber, et al., 2004)

2.3. Motivations for Cooperation in PGG

Why do people act cooperatively in repeated public goods games? As noted in section 2.1 PGG and its Rationale, some theories (e.g., Expected utility model) emphasize self-interested motives in human behaviour. Nonetheless, millions of people give to public goods like the Red Cross and Public Broadcasting, and generally contribute sizable sums indicating that people do act for the public good in some situations. In such mixed-motivations social dilemmas, the motivations for humans to cooperate are at least threefold: 1) egoism, to maximize their own benefits in the long run; 2) fairness, to minimize the gap between their own and their

opponents' benefits; 3) altruism, to maximize their opponents' benefits. This idea was partially supported by (Batson, 1994), who conceptually analysed and claimed that the reasons for people acting for the public good are egoism, altruism, collectivism and principlism, though there is limited empirical evidence for these claims. Specifically, the ultimate goal of egoism is self-benefit; the ultimate goal of altruism is to increase one or more other individuals' welfare; the ultimate goal of collectivism is to increase group welfare; and the ultimate goal of principlism is to uphold one or more moral principles (justice or the utilitarian principle). However, the latter two motivations (collectivism and principlism) have little evidence to support them. In this thesis, these three motivations (egoism, fairness, altruism) will be presented and discussed in detail in the following sections (see the graphic as shown in Figure 7). Two of the three motivations, map onto Batson's (1994) claims, namely egoism and altruism. Egoism is serving the public good to benefit oneself whereas altruism refers to serving the public good to benefit one or more others. The idea of fairness motivation is similar to and potentially categorized as principlism, on the condition that the upholded principle is egalitarianism.

2.3.1. Egoism: Self-interested Motives

So why do people act cooperatively in repeated public goods games? The first and most obvious answer is egoism. Serving the public goods to benefit oneself is consistent with the pervasive assumption that all human action is motivated by self-interest, supported by expected utility/rational choice theory. When one considers the conflict of self-interest and collective interest this transforms into a "short-term loss but long-term gain" issue, and therefore when translated in this way illuminates the motives for self-interest. Thus, the individual may decide to act for the public good as a means of reaching long-term self-benefit at the expense of short-term loss,

consistent with resource-exchange based theories, which consider economic maximizations as a motivator of cooperative behaviours (predictions of the interdependence theory or the cost-benefits analysis of the SAVE framework).

Another explanation of acting for the collective good in social dilemmas redraws the boundaries of self-interest in a different way, that is, group identity (Batson & Ahmad, 2009). When the self can be defined at not only the personal level but also at the group level (collective interest), then this can cause overlap with the individual's personal self-interest, according to self-categorization theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987), and group engagement model (Tyler & Blader, 2003). Through the transformation of collective interest into self-interest, the conflict in the public goods no longer exists. Thus, in turn, heightened group identity increases the contribution to the public goods.

Undoubtedly, viewed in this way, the self-interested motive (egoism) is the major incentive that drives people to act cooperatively either via enlightened self-interest or via the self-collective interest overlap through group identity. However, a number of behavioural and social scientists have found that all action for the public good does not seem to be fully explained by egoism alone. As suggested by theories discussed earlier, for example the group engagement model, the importance of justice in cooperative decision-making becomes an important determinant of behaviour.

2.3.2. Fairness: Maintaining the Social Norms

Another motive for people acting cooperatively in public goods is to maintain social norms within the community; after all, self-interest is not the only motivation for acting cooperatively in public goods, as some theories argue. Norms here comprise of social norms, such as equality/fairness (Ainsworth & Baumeister, 2013; Yamamoto & Takimoto, 2012), justice (Schroeder, Steel, Woodell, & Bembenek,

2003), egalitarianism (C. T. Dawes, Fowler, Johnson, McElreath, & Smirnov, 2007), inequality aversion (Camerer & Fehr, 2001), and reciprocity (Falk & Fischbacher, 2006). Social norms are standards of behaviour that are based on widely shared beliefs on how individual group members ought to behave in a given situation (Hechter & Opp, 2001). These social norms, to some extent, are similar to each other, such as egalitarian motivation/justice (Van Lange, 2008). "Fairness" is the central key word for the social norm, as indicated by the group engagement model which focuses on procedural justice, and will be fully discussed in this thesis. "Fairness, defined in terms of mutual advantage or impartiality, may, in appropriate conditions, directly favour equalitarianism" (Ainsworth & Baumeister, 2013, p. 75). It regulates social exchanges between members of groups and is designed to promote group harmony to ensure that everyone gets what they deserve, in this case, the promotion of cooperation and deterring free riding (Van Vugt & Van Lange, 2006).

2.3.3. Altruism: Concern for Others' Welfare

The third motivation for people acting for the public good is altruism (Alger, 2010; Kurzban, Burton-Chellew, & West, 2015), or so called "kindness" (Andreconi, 1995) or "warm-glow" (Andreoni, 1990). Altruism is defined as the ultimate goal to increase other individuals' welfare (Batson, 2011). There is a growing body of empirical studies that show that this motivation is critical to generating cooperative behaviours in public goods experiments.

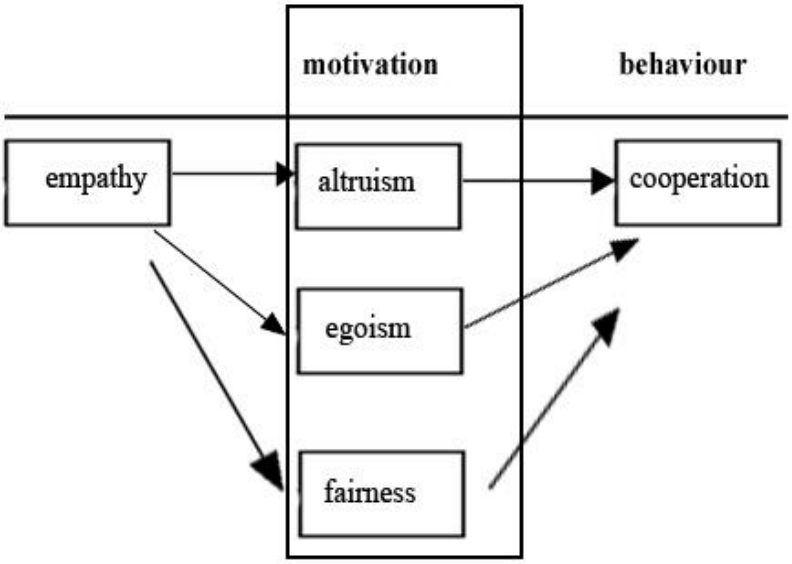

Figure 7. The motivations of acting cooperatively in PGG

2.4. Theories concerning the Empathy-cooperation Link

Four theories (the independence theory, the SAVE framework, the group engagement model and the appropriateness framework) are presented to explain why people cooperate and also the three potential motivations for acting cooperatively in the PGG. As discussed earlier, some theories explicitly focus on explaining how it is that people cooperate and the underlying mechanisms that guide this behaviour. This thesis is particularly interested in the empathy-cooperation link. Psychological theories have debated, for several decades, the empathy-cooperation link, with a focus on whether empathy induces altruism or egoism. The representative theories are the empathy-altruism hypothesis and the negative-state relief hypothesis.

2.4.1. The Empathy-altruism Hypothesis

As shown in Figure 8, the empathy-altruism hypothesis theory (Batson, 1991) assumes that empathy will produce altruism towards the person one is empathizing with, and one will show concern about the person's welfare, resulting in behaviour that will likely help that person. Figure 8 provides an overview of the theory by

putting the antecedents of empathy, the empathy-altruism hypothesis, and the behavioural consequences of empathy together. Empathy, namely empathic concern in Figure 8, is defined as an other-oriented emotion elicited by, and congruent with, the perceived welfare of someone in need. The empathy-altruism hypothesis claims that empathy (empathic concern) only produces altruistic motivation. The overview indicates that the observed behaviour is a product not only of altruistic motivation but also of the cost-benefit analysis prompted by altruistic motivations; and that this analysis involves weighing the costs and benefits associated with each possible behaviour.

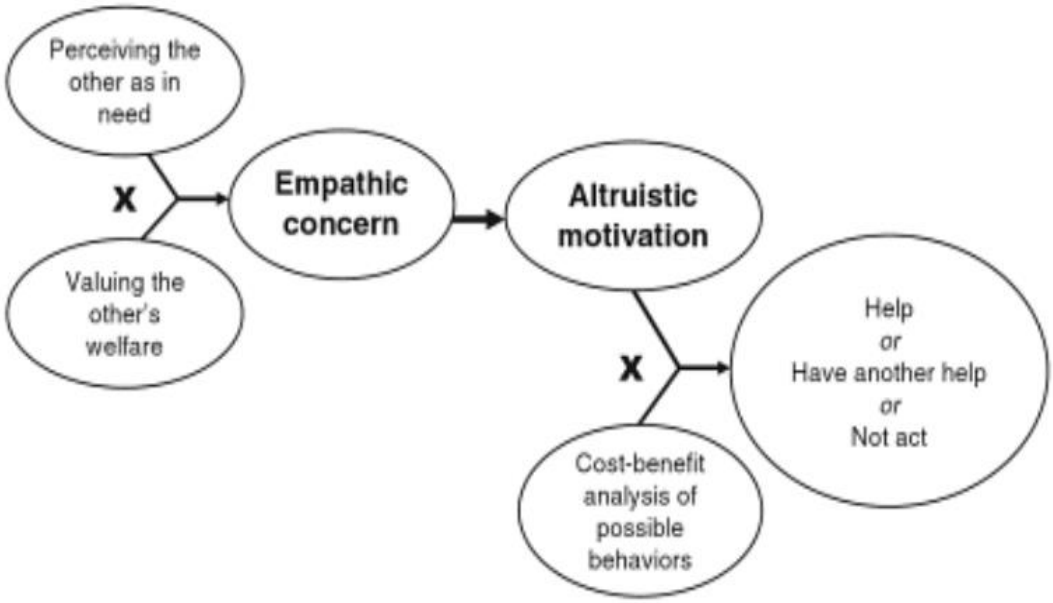

Figure 3.2 Overview of a Theory of Empathy-Induced Altruistic Motivation

Figure 8. Overview of the theory of empathy-altruism hypothesis adopted from (Batson, 2011, p. 80)

2.4.2. The Negative-state Relief Hypothesis

The contrasting negative-state relief hypothesis (Cialdini, Kenrick, & Baumann, 1982) argues that empathy induction triggers egoistic motivations. These theorists suggest that individuals who experience empathy when witnessing another

person's suffering are in a negative affective state of temporary sadness or sorrow- and that this in turn prompts them to act pro-socially (particularly refers to helping) in order to relieve their own negative state.

Both theories accept that the empathic emotion is one of the key motivations to act pro-socially (help), and empathy leads to increased helping. They also both agree a person feeling empathy for another in distress is likely to feel sadness and temporary depression, and that helping is likely to dispel the sadness and temporary depression. Where they disagree is over the nature of the motivation that is evoked by feeling empathy for another in distress. The negative-state relief hypothesis claims that the motivation is directed toward the egoistic goal of the helper by providing mood-enhancing self-rewards. The empathy-altruism hypothesis claims that the motivation is directed at least in part toward the altruistic goal of relieving the other's distress (Batson et al., 1989). However, both theories mainly focus on the explanation of the empathy-helping association. As stated in section 1.4.2 Definitions of Cooperation, the difference between cooperation and helping is the interdependent relation between the two parties. In the PGG, cooperation is obviously investigated as the outcome is interdependent (cooperation) rather than dependent (helping), and the interdependent relation is more likely to influence the behavioural response.

Moreover, a large number of empirical studies (Van Lange, 2008; Van Vugt & Van Lange, 2006) have already shown that empathy does indeed produce altruism rather than egoism. This thesis considers the point of view of the empathy-induced altruism hypothesis. One remaining issue is that the theory does not discuss whether such a motivation is strong enough to lead to increases in acting cooperatively when confronted with the public goods problem. Thus the question remains: To what extent

is empathy-induced altruism effective in producing behaviour change (i.e. increased cooperative behaviours)?

2.5. Link between Theories and the Present Empirical Studies in this thesis

A series of four empirical studies were designed in this thesis to address the empathy-cooperation link. Each, in effect, addressed the general question "What is the effect of empathy on cooperation?" Study 1 was designed to examine the empathy-cooperation link in the PGG. According to the empathy-altruism hypothesis, Parks' Integrated Model explicitly demonstrated (see Figure 3) that empathy is conceptualised as an individual difference (i.e. dispositional), further influencing the secure attachment system and subsequently affecting the predisposition to cooperate. The predisposition to cooperate plays a critical role in the transformation of the *given matrix* to *effective matrix*, and consequently affects cooperative decision-making. The SAVE framework (see Figure 4) does not explicitly mention the role of empathy in pro-sociality, however it implies that individual differences will affect D (default) and K if empathy does indeed play a role in cooperative decision-making. The group engagement theory does not explicitly point out the role of empathy on intragroup cooperation. The appropriateness framework can be applied here, since it assumes that empathy induction will affect the recognition of a situation, and in turn individual differences regarding dispositions of empathy affecting identity in a way that influences the decision to cooperate (i.e. the greater the disposition of empathy, the more likely the individual will cooperate in a situation identified).

Study 2, described in Chapter 4, was designed to explore the role of personal values, considered as a potential social cue affecting the empathy-cooperation link. According to identity-based theories (the group engagement model and the appropriateness framework) identity plays a critical role in determining cooperative

decision within a group. Shared values are essential parts of self-identification and recognition (Van Zomeren, et al., 2008), and these should in turn potentially promote cooperative behaviours. Therefore, Study 2 was designed and conducted in such a way as to examine this idea.

Studies 3A and 3B (Chapter 5) aimed to explore the impact of empathy on cooperation in the PGG when the endowment is heterogeneous, and the origin of endowment (endowed vs. earned) is also manipulated. Through the creation of heterogeneous endowments, the status concept is involved, and as such status within the group is considered another important psychological concept for Study 3. According to identity-based theories, especially the group engagement model, status is identical to the *respect* concept, which is the status within a group. The claim is that the concept of status affects individuals' identity judgments as a result of behavioural engagement within a group, which should in turn affect cooperative behaviours. To explore the concept of status in the empathy-cooperation link, Study 4 is designed to replicate Study 3. However, unlike studies 1, 2 and 3 which explore intragroup cooperation, Study 4 is examines the empathy-cooperation link under dyadic interaction. This will be discussed in the Chapter 6.

Chapter 3 Study 1: The Role of Empathy on Cooperation in PGG with Homogenous Group Setting

Summary of Chapter 3: The previous chapters have reviewed work that considered the theories and methodologies that examine the link between empathy and cooperation. The next four chapters present four laboratory studies that were designed to address the main research question for this project, "What is the effect of empathy on cooperation?" This first study specifically addresses the following research hypotheses. Hypothesis 1: There will be a main effect of empathy, such that the rates of contribution will increase in the Public Good Game (PGG); Hypothesis 2: Conditions in which empathy is induced (high-empathy condition, low-empathy condition) should decrease *generalized tit-for-tat strategy* use compared to the no-empathy condition; Hypothesis 3: Individuals' higher dispositional empathy ability should contribute more in the PGG than those with low dispositional empathy. Also, those with higher dispositional narcissism should show a negative association with contributions in the PGG.

The first study uses a typical linear PGG to examine whether inducing empathy increases cooperation, and whether individual differences, including dispositional empathy and narcissism, predict cooperative behaviour in a PGG with a homogenous group setting. Sixty-nine participants were randomly allocated to one of the following conditions: high-empathy, low-empathy and no-empathy. After administering an empathy induction manipulation, all participants completed 10-rounds of the PGG, followed by the Interpersonal Reactivity Index (IRI) questionnaire, and Narcissistic Personality Inventory (NPI). The results from Study 1 showed that the induction of empathy did not increase contributions in the first round

of the PGG, and moreover, it did not impact on contributions on all other rounds. In addition, dispositional empathy ability and narcissism personality did not correlate with behaviour in the PGG. However, age (age range from 18 to 56 years old) appeared to be a predictor of cooperation in the PGG; in the direction that older people were more likely to contribute more in the PGG overall as compared to younger people. A detailed account of the study itself, including the rationale, methodologies and findings, are presented in the rest of this chapter.

3.1. Introduction

Cooperation is widely investigated and examined using experimental economic games. As the most frequent pro-social behaviour (Iannotti, 1985), cooperation is one of the most investigated in social psychology; this is mainly because cooperation is critical in many social exchanges, from small-scale interactions between individuals up to macro-scale levels of interaction between whole societies. As stated in section 1.4.3 Measures of Cooperation, most psychologists (Batson & Ahmad, 2001; Haselhuhn & Mellers, 2005; Rumble, et al., 2010; Sanfey, Rilling, Aronson, Nystrom, & Cohen, 2003) investigate cooperation (in terms of two players' cooperation) using social dilemmas, specifically the prisoner's dilemma game and the ultimatum game. In some cases the public goods game (PGG) is used as well as the common resource dilemma, both of which involve more than two-players. As mentioned in section 2.1 PGG and its Rationale, PGG is the experimental paradigm used throughout the whole project. It is speculated that cooperative behaviour in social dilemmas is affected not only by contextual factors (e.g., the introduction of changes in payoffs, increasing communication, promoting trust), but also by dispositional factors. In order to situate the work of the present study in relation to other related work, the introduction begins with some general

details regarding contextual (e.g., the introduction of changes in payoffs, increasing communication, promoting trust) and dispositional factors (e.g., trust, social value orientation) associated with promoting cooperation. This section will firstly detail various other factors that have been the focus of researchers attention in promoting cooperation in social dilemma games. The subsequent section presents details behind the contextual and dispositional factors that are specifically explored in the present study (i.e. inducing empathy to promote cooperation, examining personality traits that in turn are thought to be associated with cooperation).

3.1.1. Contextual Factors thought to Promote Cooperation

As mentioned in section 2.1 PGG and its Rationale, one of the greatest challenges to cooperation is free riding. Free riding generally refers to individuals who always pay out less than the average contribution of others (Kurzban & Houser, 2005). It is a tempting strategy to adopt given that paying out the least while at the same time enjoying access to a public resource means that one can maximize one's own gain by exploiting the contributions of others. However, if everyone free rides, the public good will no longer exists. So, many researchers have been interested in answering the following: "What can one do to promote and maintain cooperation?" which in turn also means limiting free riding. According to the existing literature, some general answers to this question have been found in manipulations of the payoff structure of the social dilemma, as well as the introduction of a sanction system. The motivation for this is to change the cost-benefit ratios in order to make cooperation more salient. In addition manipulations have also focused on facilitating communication, trust and empathy as ways to enhance cooperation, all of which are treated as contextual manipulation regarding the game itself. These factors will be discussed below.

3.1.1.1. Sanction System

Implementing a sanction system (reward for cooperation & punishment for defection - or alternatively - free riding) has proved to be an effective method of promoting cooperation and reducing the free riding problem. For example, one of the most cited studies using this approach is by Fehr and Gächter (2000). They found that punishment constituted a credible threat for potential free riders and caused a large increase in cooperation levels (82.5% per cent full cooperation in punishment condition vs. 53% per cent in no-punishment condition). Sefton, Shupp, and Walker (2007) introduced reward by using tokens (representing money, in their case 10 cents) into the experiment, and the reward treatment was found to successfully facilitate contribution. A meta-analysis (Balliet, Mulder, & Van Lange, 2011) examining 187 studies, that have used sanctioning systems in social dilemma games, reported the effectiveness of rewarding cooperation, and punishing free riding as $d = 0.51$ and $d = 0.70$, respectively.

There are, however, negative consequences regarding the implementation of sanction systems. Some have argued that the constant threat of punishment leads to decreases in intrinsic motivation to cooperate consistently highly (Yamagishi, 1988). More to the point, the cost of actually administering sanctions is also seen as less attractive manipulation in social dilemma games (Edney & Harper, 1978; Jensen, 2010). Mulder, van Dijk, De Cremer, and Wilke (2006) found that such sanctioning systems in social dilemma games undermine the trust-belief that other members in the game are motivated to cooperate. Overall, it appears that the introduction of sanctions is an effective way to maintain cooperative levels in social dilemma games, but at the expense of reducing other qualities that are important in social exchanges, such as trust and motivation to help others. Therefore, while this is a reliable technique, it

does interfere with core attributes that are thought to be integral in social exchanges, and one may wonder how long sanctions can be implemented in a social dilemma game (beyond the typical 10 rounds) before more severe detrimental effects emerge.

3.1.1.2. Communication

Enabling communication in social dilemma games has been found to be an effective means of promoting cooperation (Bixenstine & Douglas, 1967; Rapoport & Suleiman, 1993). Typically, communication in social dilemma games involves players discussing their potential choices in a social interaction task (task-related communication), answering questions concerning the best gifts they ever received (T. R. Cohen, Wildschut, & Insko, 2010), or estimating the percentage of people at certain income levels in a certain town in the United States (R. M. Dawes, McTavish, & Shaklee, 1977) (task-unrelated communication). Communication was not only found to promote cooperation directly, but also to solve the uncertainty that "noise" brings, that is, to be more willingness to forgive an incident of "noise" in social dilemma (Tazelaar, Van Lange, & Ouwerkerk, 2004). "Noise" refers to the phenomenon in which people show discrepancies between their intended and actual behaviours as a result of errors; for example, imagine you are late to meet up with a friend because there is a delay in the public transport you are using, this means that while you intended to be there on time, you were prevented from doing so; communication here can help to limit any negative consequences that might follow from a misinterpretation of an outcome as intended, rather than by accident/error. However, not all types of communication have been shown to enhance rates of cooperation in social dilemmas (R. M. Dawes, et al., 1977). What seems to be critical is that the communication between players in such games needs to be focused around promoting cooperation by activating interpersonal norms related to fairness and trust

(T. R. Cohen, et al., 2010). This has been shown in social dilemma games presented as a single-trial interaction (Insko et al., 1993) or iterated over rounds (Wichman, 1970). Furthermore, a meta-analysis (Balliet, 2010) systematically analysed the positive communication-cooperation association (d = 1.01) from 45 empirical studies while taking into account several moderator factors (e.g., types of communication, discussion before versus during the dilemma and group size). The meta-analysis revealed that communication via speech was more effective in promoting cooperation than in written form. Interestingly there was no difference in rates of cooperation if communication has been established before the social dilemma game, or during the game, but what did matter was that there was a stronger communication-cooperation association in larger groups (n > 2) than in smaller groups (n = 2).

Overall, it appears that communication, in and of itself, is not key to promoting cooperation. Instead it appears that only when the content of communication is focused specifically on social dilemma games, and is presented in a specific medium, does the degree of cooperation seem to be associated with communication. To ensure the highest levels of cooperation, the most effective manipulations require communication to be via speech, and designed to signal information regarding intentions. This may also relate to the effectiveness of sanctioning, which is also a means of signalling what is deemed to be the most relevant behaviour in the social exchange of the dilemma task.

3.1.1.3. Trust

Apart from using a sanction system, or introducing the opportunity to communicate with other players, trust building (Balliet & Van Lange, 2013a; De Cremer, 1999; C. D. Parks, et al., 2013) is another key factor that has been used to increase cooperation, particularly in mixed-motive situations. Social dilemma games

are an example of this, because people can either be motivated to cooperate or defect (i.e. free ride). According to Mayer, Davis, and Schoorman (1995, p. 712), trust is "the willingness of a party to be vulnerable to the actions of another party based on the expectations that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party".

Research on social dilemmas has shown that trust influences expectations regarding another's motives (De Cremer, 1999), and again has some connections with communication - given that signals to motivations and intent are critical for others to determine the extent to which they will reciprocate. More to the point, trust is thought to affect cooperative decision-making in two ways: 1) contextual cues (i.e. through inducement), 2) individual differences (i.e. dispositional) - the details are discussed in the next section 3.1.2.1 *Dispositional trust.*

Though difficult to induce (typically in establishing reciprocity, and initial willingness to cooperate - which in turn signals to others good intent), it seems clear that trust is a powerful tool in promoting cooperation, because it reduces the fear of being exploited by others (Komorita & Parks, 1994). De Cremer (1999) presented empirical evidence showing that when players trusted other players, fear of free riding decreased, and reciprocity was strengthened in the PGG game. In effect what establishing trust in the game did was to strongly reinforce perceptions of fairness in the group of players (Buchan et al., 2011; T. R. Cohen & Insko, 2008).

3.1.2. Dispositional Factors thought to Affect Cooperation

3.1.2.1. Dispositional Trust

Outside of building trust by making it salient in social dilemma games, researchers have examined the extent to which people showing high levels of personality traits such as trust (dispositional trust) are associated with cooperative

decision making (Deutsch, 1973). Several studies show that in social dilemma games high trusters (who expect reciprocity) cooperated irrespective of whether others cooperated, and tended to cooperate more overall than low trusters. With regards to the PGG, studies show that people scoring high on measures of dispositional trust contributed more in a PGG than those scoring lower in dispositional trust measured by Yamagishi's Trust Scale (C. D. Parks & Hulbert, 1995; Yamagishi, 1988; Yamagishi & Sato, 1986). Nonetheless, De Cremer, Snyder, and Dewitte (2001) pointed out that the positive relationship between dispositional trust and cooperation should take situation cues and individual predispositions, specifically accountability and self-monitoring, into account. In other words, people who display high levels of self-monitoring, may be low trusters, but they are in turn concerned with the accountability of their own actions, and so their concern for how they are perceived means that they show high levels of cooperation, even though they score low on dispositional trust. Balliet and Van Lange (2013a) conduced a meta-analysis on the relation between trust (both contextual and dispositional) and cooperation. Results showed there was only a small to moderate positive association between dispositional trust and cooperation (r = .26) based on a total of 60 effect sizes. However, their analysis has been criticized, and the positive link reported by the meta-analysis has been argued to be the result of publication bias. All in all, this evidence does support the view that dispositional trust is positively associated with cooperation, but there are also limitations attached to this work.

3.1.2.2. Dispositional Social Value Orientation

To date, the most investigated personality trait in connection to cooperation is social value orientation, which measures what are thought to be stable preferences for outcomes that impact others, and oneself (Bogaert, Boone, & Declerck, 2008, p.453).

Unlike many other personality traits, social value orientations are primarily rooted in social relations rather than specific characteristics of an individual (Dovidio, 2006). As indexed by the social value orientation, those preferring outcomes that benefit others (pro-socials) contributed more in a PGG than those that showing individualist and competitive traits (pro-selfs) (De Cremer & Van Dijk, 2002). This suggests that those with a tendency to be pro-social demonstrate pro-social behaviours even in laboratory based social dilemma tasks. However, in terms of social value orientation, the measures used are in fact similar to the social dilemma games in which cooperation is also measured (Messick & McClintock, 1968). On the other hand, social value orientation measures have been found to quite accurately predict personality descriptions given by friends and roommates (Bem & Lord, 1979) and everyday activities, including volunteering for charitable causes (McClintock & Allison, 1989; Van Lange, Bekkers, Schuyt, & Van Vugt, 2007). Therefore, one may question the extent to which this is a valid measure (see critical comments in Chapters 1 and 2) on which to base any assessments between dispositions and behaviour in social contexts, if the items in both cases overlap. Further discussions on this issue can be found in section 4.1 Introduction.

3.1.3. Contextual and Dispositional Factors that are Specific to the Present Study: Empathy

A variety of contextual factors (sanction system, communication, trust) and personality traits (trust, social value orientation) that researchers have speculated to be relevant in promoting cooperation, have been discussed above. Nevertheless, few of these factors appear to be free from problems and challenges. The remaining section outlines the details regarding the specific contextual factors that have a bearing on the

present study – and their connection to the theoretical proposal outlined in Chapter 2 on which the empirical work is based.

3.1.3.1. Empathy and General Cooperative Behaviours

Empathy, as discussed at length in Chapters 1 and 2, broadly refers to an "other-oriented" emotional response congruent with the perceived welfare of another (Batson & Moran, 1999). Therefore, the discussion here will be brief, and the focus will be on contextual factors that have a bearing on the kind of manipulations explored in Study 1. While there is evidence to suggest that inducing empathy will increase cooperative behaviour, there are only a handful of studies (Batson, Klein, et al., 1995) that have examined this positive empathy-cooperation link, as discussed in the section 1.3.2 Category 2. Previous studies (Batson & Ahmad, 2001; Batson & Moran, 1999; Rumble, et al., 2010) have consistently found that empathizing with others in a prisoner's dilemma is associated with more cooperation than defection decisions. Moreover, the empathy-cooperation link has been examined in common resource dilemma games (1999) and the PGG (1995). Batson, Batson, et al. (1995) found that inducing empathy towards one of the other group members did indeed increase allocation of resources to that person, but as a result this diminished resources to the common good. In their version of PGG, participants were required to decide whom they were going to devote their tokens to, i.e. 1) the group pot, or 2) one of the other group members, or 3) keep them all for themselves. Batson et al (1995) came to the conclusion that directed induced empathy could be effective, but it came at the cost of promoting cooperation generally. However, in their experimental paradigm, empathy induction was not designed to observe behaviour change under conflict between self-interest and collective-interest, but rather to observe behaviour change under the conflicts between self-interest, other-interest and collective-interest

via empathy. Given the paucity of studies those have successfully induced cooperation via empathy at a group level rather than towards another member, Study 1 is designed to build on the techniques developed by Batson et al (1995) in order to promote cooperation under conditions in which conflicts only exist between the group's interest and self-interest. Does empathy induction modulate people's behaviours under this type of conflict?

3.1.3.2. Empathy Induction Modulating Strategy Use

Empathy induction (different contextual information) may not only influence cooperative behaviour (i.e. choosing to cooperate or defect), but also the kinds of strategies used. As discussed in section 2.1 PGG and its Rationale, unconditional cooperating, unconditional free riding and generalized tit-for-tat strategy are three strategies frequently found when dealing with iterated social dilemma games. One of the most effective strategies is *generalized tit-for-tat* strategy. This strategy is an efficient way to play multi-player iterative games (prisoner's dilemma, PGG),because simply matching the behaviour of the other player(s) does not involve developing an independent strategy of one's own (Axelrod, 1984). *Generalized tit-for-tat* strategy is a strategy based on reciprocity (Axelrod & Hamilton, 1981). It has been speculated that empathy can reduce *generalized tit-for-tat* in social dilemma games via an empathy induction method (Batson & Ahmad, 2001; Batson & Moran, 1999; Rumble, et al., 2010). The idea here being that information that signals the needs of others, - i.e. empathy induction, is designed to prioritize the focus on the needs of others, rather than developing a selfish strategy that only benefits the other player(s) if they show initial or sustained willingness to cooperate.

3.1.3.3. Dispositional Empathy

Several reviews (Eisenberg & Miller, 1987; Underwood & Moore, 1982) have argued that dispositional empathy is predictive of pro-social behaviours in a variety of contexts. However, empirical work examining a direct link between dispositional empathy and cooperative behaviours in social dilemma games is scant. For this reason dispositional empathy will be examined in the present study, with an expectation, based on the reviewed work, that there should be a positive correlation with cooperative behaviours in the PGG.

There are several items used to make assessments of dispositional empathy. In Study 1 and all others in the present thesis, dispositional empathy was measured using Davis's (1983) Interpersonal Reactivity Index (IRI), which consists of four subscales: perspective taking (PT), empathic concern (EC), personal distress (PD) and fantasy (FT). The PT scale assesses the tendency to spontaneously adopt the psychological point of view of others; FS scale taps respondents' tendencies to transpose themselves imaginatively into the feelings and actions of fictitious characters; EC scale assesses "other-oriented" feelings of sympathy and concerns for unfortunate others, and the PD subscale measures "self-oriented" feelings of personal anxiety and unease in tense interpersonal settings (Davis, 1983). Because this particular measure is the most comprehensive method of assessing dispositional empathy it was favoured over the many other methods of determining dispositional empathy. For this reason, the IRI was the questionnaire of choice used for the all the studies in this thesis.

3.1.3.4. Dispositional Narcissism

Another personality trait that has a bearing on pro-sociality, though for antithetical reasons to dispositional empathy, is narcissism. Narcissism is the opposite trait to empathy. As one of the dark triad personalities (i.e. Sociopathy, Machiavelism,

Narcissism), narcissism was first reported in the psychological literature in 1898 and referred to as "a tendency for the sexual emotions to be lost and almost entirely absorbed in self-admiration" (Ellis, 1898, p. 280). According to the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, narcissistic personality is a disorder in which the following clinical criteria apply: a grandiose sense of self-importance or uniqueness; a preoccupation with fantasies of unlimited success, power, brilliance, beauty, or ideal love; exhibitionism; an inability to tolerate criticism, the indifference of others, or defeat; entitlement or the expectation of special favours without assuming reciprocal responsibilities; interpersonal exploitativeness, relationships that alternate between extremes of overidealization and devaluation; and a lack of empathy. Therefore, based on these characteristics, in the present project, one avenue by which to examine the link between empathy and cooperation was to examine whether the absence of empathy (as observed in those who have narcissist tendencies) would also be associated with a lack of cooperation (i.e. more free riding).

Of the various measures of narcissism that have been developed, the Narcissistic Personality Inventory (NPI) by Raskin and Hall (1979) measures individual differences in narcissism in nonclinical populations. This is the measure adopted in the present study. In Study 1 the full-scale 40-item NPI (Raskin & Terry, 1988) was used to measure the participants' individual differences in narcissism. The seven NPI component scales are Authority, Exhibitionism, Superiority, Entitlement, Exploitativeness, Self-Sufficiency and Vanity. As some studies (Ehrenberg, Hunter, & Elterman, 1996) have shown that the self-centered personality trait narcissism seems to have a negative impact on maintaining cooperation, this negative association

was also expected to be observed between narcissism personality and lack of cooperative behaviours in the PGG used in Study 1.

3.1.4. Present Study

The present study focused on the empathy-cooperation link. The motivation was simply to assess the extent to which inducing empathy based on prior established methods would promote cooperation, and also to measure the extent to which dispositions (i.e. empathy, lack of empathy [narcissism]) predicted cooperation in the PGG.

The first main Hypothesis 1 that was tested was the following: There will be a main effect of empathy such that, according to previous work that has developed empathy induction techniques, rates of contributions will increase in the PGG. To test this, Study 1 included two different levels of empathy induction (high-empathy condition, low-empathy condition), and a baseline (no-empathy induction). In the empathy induction conditions, the aim was to induce empathy towards all three other group members, as opposed to the technique adopted by Batson et al (1995) in which empathy induction was towards only one other player.

In the case of the Batson et al., (1995) study, participants had three choices, keeping the tokens, giving the tokens to the group pot, or giving the tokens to one of the three other players. In Study 1 of this thesis, participants only need to decide how many tokens they are willing to contribute to the group pot, which is deemed as benefiting the collective. Regardless of the amount of tokens the other players contribute, the more the participants contribute, the more cooperative they are. For such purposes, the study is deliberately designed in this way to examine whether empathy induction promotes cooperation if participants are confronted with only self-interest and collective interest conflict.

Hypothesis 2: Conditions in which empathy is induced (high-empathy condition, low-empathy condition) should decrease *generalized tit-for-tat* strategies as compared to the no-empathy condition; The *generalized tit-for-tat* strategy is an efficient way to play multi-player iterative games (prisoner's dilemma, PGG); this is because simply matching behaviour of the other players is a cognitively efficient method of deciding what to do (Axelrod, 1984).

Hypothesis 3: Hypothesis 3a, individuals' dispositional empathy ability should predict their contribution in the first round of PGG, in that those with higher dispositional empathy ability should contribute more than those with low dispositional empathy. Hypothesis 3b those scoring high on dispositional narcissism should show a negative association with cooperative behaviours in the PGG.

3.2. Method

3.2.1. Participants

Sixty-nine volunteers (47 female and 22 male) were recruited from Queen Mary University of London via emails and fliers. The mean age of the participants was 22.68 years (range from 18 to 56; *SD* = 5.65). All participants gave written informed consent prior to participation. After the experiment, they were paid an amount for their participation on the basis of the tokens gained in the PGG. In each PGG 25 tokens were equal to £1, which all participants were made aware of at the start of the experiment. The actual payment ranged from £6 to £12. The Ethics Committee of Queen Mary University of London approved the study (QMREC1190). Participants were randomly allocated to one of three conditions (high-empathy condition, low-empathy condition, no-empathy condition).

3.2.2. Design and Materials

Study 1 was a between-subject design with 3 levels (empathy [high-empathy, low-empathy, no-empathy]), and the critical dependent variable was participants' proportion of contribution (PoC) per round in the main PGG, of which there were 10 rounds in total. A prior power analysis was conducted using G*power (http://www.gpower.hhu.de/en.html) to infer the required sample sizes for this study (Faul, Erdfelder, Lang, & Buchner, 2007). Assuming the effect size of empathy is the medium effect (f = 0.25) suggested by Cohen, defined for between subject repeated-measures ANOVA (J. Cohen, 1988), Study 1 required 90 participants in order to be sufficiently statistically powerful (1-β = .8). The rationale of using the medium effect size to conduct power analysis will be discussed in details in section 7.3.3 Sample Size, Effect Size and Statistical Power. In addition, the study included several items, both prior to and following the main task. There were five pre-task questions concerning participant's experiences (i.e. positive, negative and their hobbies), for example, "Describe an event that has happened to you that has made you sad in the last year" and "What hobbies do you have". Then participants were presented with the PGG task, and then they were presented with several post-task questions and questionnaires.

The PGG task was presented in E-prime 2.0. The way the game was set up was that each participant played with three other virtual players that they could see on screen- (actual photos and profiles were from past Dynamic learning and decision-making lab members - therefore participants would not have been seen them before). In the high-empathy condition, the three other people's profiles referred to a serious event that had happened to each of them (Player 1= a break up with a partner, Player 2 = a car accident, Player 3 = a stolen mobile phone). In addition, participants were

also instructed, “While you are reading this, try to imagine how the person felt about what they have just described. Try to imagine how it has affected them and how they feel as a result”. This was based on Batson & Moran’s (1999) empathy induction method. In the low-empathy condition participants read the same profiles as those in the high-empathy condition, but they were instructed, “While you are reading this, try to take an objective perspective towards what has just been described. Try to remain as objective and detached as possible.” This served as an intermediate level of empathy induction based on previous empathy induction techniques. In the no-empathy conditions, participants were not given any instructions as to how to read the profiles. In addition, the profiles referred to neutral events (Player 1 = enjoy swimming, Player 2 = ride bicycle, Player 3 = run most mornings).

In the PGG, the amounts the three virtual players contributed were fixed across the participants and based on average contributions (taking into account the standard deviation) in the partner-treatment without punishment condition in Fehr and Gächter (2000) study. The combined total contribution of the three other players on each of the 10 rounds respectively was as follows: 27, 34, 31, 24, 22, 23, 24, 18, 12, and 10.

The post-task questions consisted of nine-rating scores on similarity and empathizing with the three other players’ profiles. To examine similarity, participants were asked to consider how similar they judged themselves to be relative to each of the other three players. To measure the degree of empathizing in the game, participants were asked to rate “to what extent, did you empathize with each person in the game” on a 9-point scale, ranging from 1 (*not at all*) to 9 (*very much*). Apart from these two dimensions, participants were asked to judge the facial emotions of the other players based on the following available options: happy, neutral, sad, and angry.

The questionnaires presented at the end of the study included a questionnaire to measure empathy and a questionnaire to measure narcissism. The empathy questionnaire in Study 1 was the Interpersonal Reactivity Index (IRI) (Davis, 1983) which examines participants' dispositional empathy. The narcissism questionnaire was the 40 items Narcissistic Personality Inventory (NPI) (Raskin & Terry, 1988). Finally, there was a debriefing session at the end of the experiment. Here participants were asked by the experimenter to report the strategies they used in the PGG, and the extent to which they were aware of any interactive deception – i.e. that they were not interacting with three real other players.

3.2.3. Procedure

Figure 9 shows the procedure for the experiment. Participants took part in the experiment individually and they were led to believe that three other players were taking part online simultaneously with them.

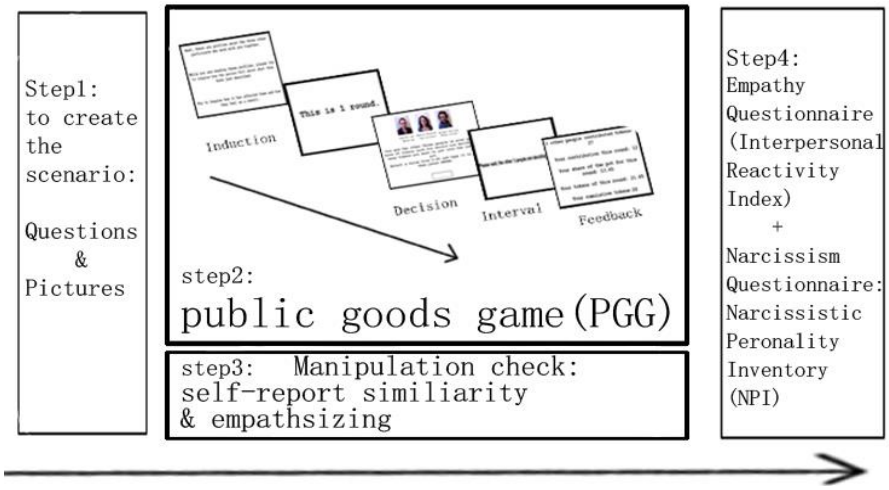

Figure 9. The procedure of experiment

After arriving at the lab, participants were escorted to the experimental cubicle. The experimenter briefly explained the requirements of the experiment. After giving informed consent, a passport photo of the participants was taken by the experimenter to use in the profiles for the experiment. In addition, they were also

required to answer the pre-task questions (5 questions) in as much detail as possible. These questions involved their positive, negative experience and hobby. Once they completed the pre-task questions, they were informed that they would be required to wait for approximately 5 to 10 minutes, while the profiles were made exchanged by the experimenter. During this time, participants read the instructions for the PGG. After uploading all four pictures to the participants' computer, the experimenter came back to the lab, showed them the three virtual players' pictures, explained the instruction and informed them a time to start the PGG. This was designed to give the impression that participants were interacting with three other players simultaneously online.

Next, the participant was presented with the profiles of three other players, and then completed the 10 rounds PGG. In each round, a fixation was presented. The number of the round was presented. Then a screen consisting of the three other profiles showed, and the instruction requesting participants to enter the amount of tokens they were willing to contribute. Once participants entered their decision, the screen jumped to the next screen showing the message "Please wait, the three other players are deciding…". The timing of this screen jump was randomly presented from 5s to 10 s. Feedback was presented indicating the three other players' total contributions on that round; the contribution of the actual participant on that round, the share of group pot that round, and the cumulative tokens as points across rounds. To ensure more engagement with the task, participants were required to copy down the feedback information into the token form provided, and they recorded the details on paper. Once they completed this, they were required to press the space key to move on to the next round. It took approximately 12 to 20 minutes to complete the PGG.

3.3. Scoring

With regards to scoring for the IRI empathy questionnaire, four subscales (PT, PD, FS and EC) were scored individually. Each subscale consisted of 7 items, with some items reverse scored (items 3, 4, 7, 12, 13, 14, 15 and 19). Specifically, PT comprised of items 3, 8, 11, 15, 21, 25 and 28; PD comprised of items 6, 10, 13, 17, 19, 24, and 27; FS comprised of items 1, 5, 7, 12, 16, 23 and 26; EC comprised of items 2, 4, 9, 14, 18, 20 and 22. Similarity and Empathizing were scored according to the ratings on the post-task questions (from 1 *not at all* to 9 *very much*). The scoring of the implementation of the *generalized tit-for-tat* strategy was based on recording the correlation between the contribution of rounds 1 to 9 for the three other players and each participant's corresponding contributions in rounds 2 to 10.

In terms of the Narcissistic Personality Index, participants were assigned one point for each response that matched the scoring key. The seven component trait keys by question were as follows: Authority: 1, 8, 10, 11, 12, 32, 33, 36; Self-sufficiency: 17, 21, 22, 31, 34, 39; Superiority: 4, 9, 26, 37, 40; Exhibitionism: 2, 3, 7, 20, 28, 30, 38; Exploitativeness: 6, 13, 16, 23, 35; Vanity: 15, 19, 29; Entitlement: 5, 14, 18, 24, 25, 27.

3.4. Results

3.4.1. Empathy Manipulation Effectiveness Check

A one-way ANOVA was conducted using mean estimates of empathizing concerning the three virtual players' profiles. The analysis revealed a main effect of empathy, $F(2, 65) = 5.95$, $p = .004$. Post hoc testing showed empathizing was significantly greater in high-empathy and low-empathy compared to the no-empathy condition, high-empathy: 5.40 (1.41), low-empathy: 5.93 (1.77), no-empathy: 4.04

(2.37), p = .017 (high-empathy & no-empathy); p = .001 (low-empathy & no-empathy). There was no significant difference between high-empathy and low-empathy conditions, p = .337.

3.4.2. Empathy Manipulation

First round data were used for a one-way ANOVA to explore the main effect of empathy, which was not found to be significant, $F(2, 66) = 0.416$, p = .661. Next a 3 x 10 (Round ([1:10], within-subject variable × Empathy [high-empathy, low-empathy, no-empathy] between subjects variable) repeated-measures ANOVA was conducted. While the main effect of round was significant, $F(5.79, 37.15) = 10.29$, $p < .001$, $\eta_p^2 = .135$; the main effect of empathy was not significant, $F(2, 66) = 0.133$, $p = .876$, $\eta_p^2 = .004$ (see Figure 10).

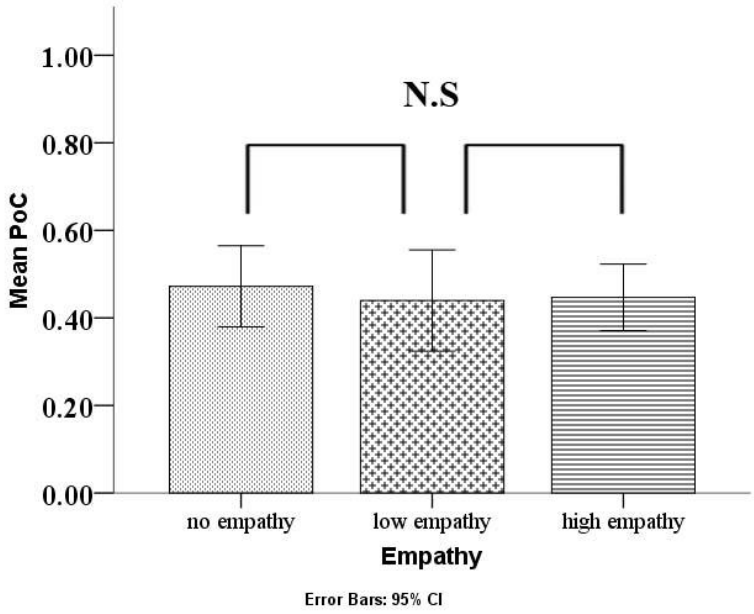

Figure 10. Mean of proportion of contribution (PoC) across 10 rounds in the three empathy conditions. Error bars represent ± 95% CI.

There was no significant interaction between round and empathy, $F(12.61, 415.99) = 0.454$, p = .945, η_p^2 = .014 (see Table 6). Greenhouse-Geisser correction was used.

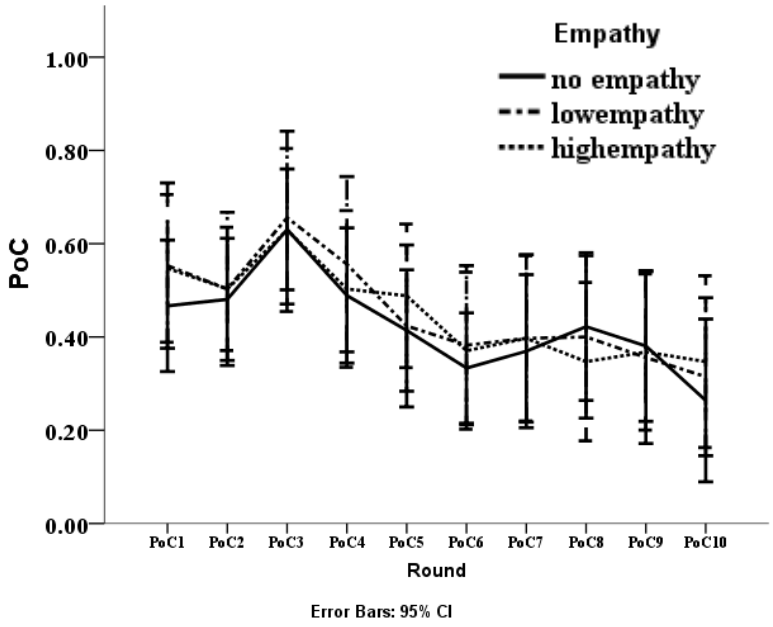

Figure 11. The average proportion of contribution (PoC) in 3 empathy conditions

Table 6 *The Mean Proportion of Contributions (PoC) in Three Conditions in Study 1*

Empathy	*n*	*M* (*SD*)	95%CI	*Generalized tit-for-tat strategy n (proportion)*
No-empathy	22	.472 (.220)	[.378, .566]	7/22 (31.81%)
Low-empathy	23	.440 (.221)	[.347, .532]	8/23 (34.78 %)
High-empathy	24	.447 (.220)	[.357, .537]	7/24 (29.17%)

Note. CI = confidence interval

3.4.3. Generalized Tit-for-tat Strategy

The number and proportion of people using *generalized tit-for-tat strategy* in each condition is shown in Table 6. A loglinear analysis revealed that there was no significant difference in the number of participants using *generalized tit-for-tat strategy* for the main effect of empathy, Z = -.004, p = .997, 95% CI [-.986, .982],

which indicates that the empathy manipulation did not modulate the tendency to use the *generalized tit-for-tat strategy* in Study 1.

3.4.4. Regression between PGG and Empathic Disposition, Narcissistic Disposition

To explore whether dispositional empathy ability (PT, EC, PD and FS) predicted contributions in the PGG, the scores of the four IRI sub-scales and overall IRI mean scores were entered into a regression analysis along with first round contribution, and age (see Table 7). Analyses failed to show that dispositional empathy ability predicted contributions. Beyond the hypothesis, age significantly predicted contribution in the first round contribution, β = .32, $t(46)$ =2.29, p = .027, indicating that the older participants (age range from 40- 56 years old in the sample) were the more likely to contribute.

Table 7 *Summary of Hierarchical Regression Analysis for Variables Prediction Contribution in First Round of PGG (N=69)*

Variables	B	SEB	β	95% CI
Step 1				
Age	.015	.007	.284*	[.002, .029]
Step 2				
Age	.017	.007	.322*	[.004, .031]
PT	.004	.061	.008	[-.118, .126]
PD	.049	.053	.116	[-.057, .155]
FS	.077	.058	.174	[-.039, .192]
EC	-.018	.078	-.031	[-.174, .138]

Note. R^2 = .081 for step 1; ΔR^2 = .044 for step 2. * $p < .05$;

In addition, a similar analysis as above was conducted on narcissistic personality scores. As shown in Table 8, seven component traits of NPI (Authority, Self-sufficiency, Superiority, Exhibitionism, Exploitativeness, Vanity and Entitlement) were calculated with none found to predict cooperative behaviour in the first round of the PGG.

Table 8 *Summary of Linear Regression Analysis for Narcissistic Personality Prediction Contribution in First Round of PGG (N=69)*

Variables	B	SEB	β	95% CI
Authority	.010	.015	.109	[-.020, .041]
Self-sufficiency	.002	.024	.014	[-.046,.051]
Superiority	.000	.023	-.001	[-.047, .047]
Exhibitionism	-.010	.022	-.074	[-.054, .033]
Exploitativeness	-.024	.026	-.147	[-.076, .028]
Vanity	.021	.031	.099	[-.040, .083]
Entitlement	-.033	.024	-.198	[-.081, .014]

Note. $R^2 = .075$

3.4.5. Deception Check

In the debriefing stage participants were presented with several questions, which were designed as a check as to whether they believed that they were actually taking part in the study with three other players simultaneously online. Thirty-eight participants reported that they believed (or at least had limited doubt) that they were genuinely interacting with the other players (deception success group) (high-empathy: *n*=12; low-empathy: *n*=11; no-empathy: *n*=15); whereas twenty-nine participants indicated they had doubts (Deception Failure Group) in the debriefing session (high-empathy: *n*=11; low-empathy: *n*=11; no-empathy: *n*=7); two participants reported that

they were not sure about their views and were not included in the analysis. An Independent Samples *t*-test was conducted to check whether interactive deception affected cooperative decisions. The analysis was not significant for the mean PoC for the 10-rounds PGG, by; deception success group (M = .425, SD = .21); deception failure group (M = .481, SD = .22), $t(65) = -1.04$, p = .30, 95%CI [-.16, .05]. However, there was a statistically significant difference for the first round of the PGG, deception success group (M = .45, SD = .29); deception failure group (M = .61, SD = .33), $t(65) = -2.10$, $p = .039 < .05$, 95%CI [-.319, -.008].

3.5. Discussion

Study 1 failed to show an association between empathy and cooperation. This is inconsistent with many studies that have reported the important role empathy plays in increasing cooperative behaviour (Batson & Moran, 1999; Rumble, et al., 2010). In addition, the evidence here failed to find any association between empathy and cooperation, regardless of the tendency of using *generalized tit-for-tat* strategy or the amount of contributions made in the PGG. What is more, the regression analysis showed that rather than dispositional empathy or narcissism predicting behaviour in the PGG, only age was a significant predictor of contributions in the first round of the PGG; this is at least consistent with work showing that pro-social orientations increase with age (Van Lange, et al., 1997), however this was not a finding that had been predicted, or central to the issues explored in Study 1.

With regards to Hypothesis 1, according to the empathy-induced altruism theory (Batson, 1991), the induction of empathy towards three other virtual players should motivate participants to contribute more than a no-empathy condition, at least in the first round of the PGG. The results indicate that there was no significant main effect of inducing empathy, which is inconsistent with previous studies (Batson &

Ahmad, 2001; Batson & Moran, 1999; Rumble, et al., 2010). There is evidence that empathy-induced altruistic motivation can increase cooperation and care in conflict situations (Stephan & Finlay, 1999). In contrast to this, the present study failed to find the predicted increase in cooperation via the empathy induction. The main reason might be that empathy may operate similarly to attentional processes, in that they operate most effectively when a target is located and is easy to specify. When the target is ambiguous, the effect of empathy appears to lose its effect, and it may in fact be the result of the "diffusion of responsibility" effect. In other words, the empathy induction may have indeed led to more empathy, but participants may have felt that the burden of responsibility to help was on others in the group. Moreover, according to the empathy manipulation effectiveness check, the empathizing rating in the high-empathy condition and low-empathy condition showed no significant difference. Therefore, in the studies in the following chapters (Studies 2, 3 and 4), only high-empathy and no-empathy contrasts were conducted, because high-empathy induction is enough to represent the empathy manipulation effect.

Although the results in Study 1 suggested that the most frequent solution in human interaction games (e.g., prisoner's dilemma) is *tit-for-tat strategy* (Nowak & Sigmund, 1993), the study also indicated that the empathy manipulations do not influence changes in strategic behaviours (i.e. a reduction in the implementation of the *generalized tit-for-tat strategy*). For those repeated interactions with the same individuals, direct reciprocity is the explanation for why people cooperate according to an evolutionary perspective (Axelrod, 1984). Under direct reciprocity, the expectation that the partner will cooperate as a return, "shadow of the future" motivates people to cooperate in order to receive the benefits of cooperation tomorrow. Direct reciprocity provides the basis for many long-term relationships in

humans, such as friendships and business partnerships. *Generalized tit-for-tat* strategy is a simple strategy that captures the essence of direct reciprocity. It might be the case that this type of situation, i.e. dealing with multi-interactions with multiple players, may have muted any possible effects that empathy would have on strategic behaviour such as *generalized tit-for-tat.*

The scenario setting check in this study showed that regardless of whether or not participants believed they were interacting with three other players, this did not affect their decision to contribute tokens across 10 rounds of PGG, but it did affect their first round contributions. The former result is curious given that participants still contributed to the group pot even though they did not believe they were interacting with real participants. More to the point this seems like irrational behaviour, especially given that in the experimental setting contributing to the common cause cost them real money. Such irrationality is difficult to explain here, and there may be other factors that account for the contributions from those that failed to believe the experimental set up, such as social desirability effects. In short, the behavioural gaps between those who believed and those who did not believe the scenario setting methods used in Study 1, highlight the importance of including scenario setting checks for laboratory experiments in which similar designs to those used here are adopted; this issue will be discussed in further detail in Chapter 4.

The findings from Study 1 were inconsistent with the positive empathy-cooperation link which were found in previous studies using other social dilemma games such as the prisoner's dilemma (Batson & Ahmad, 2001; Batson & Moran, 1999; Rumble, et al., 2010) and the ultimatum game (Barraza & Zak, 2009). Both Van Lange (2008) and Barraza & Zak's (2009) investigations demonstrated that feelings of empathy, some called them "empathic concern" -- even when not caused

by or directed toward the interaction partner -- nevertheless tended to produce more pro-social behaviour toward that partner in a social dilemma game. Explanations for the differences in the findings of the present study contrasted to the previous literature may be due the levels of ambiguity of the target of empathy, with this being ambiguous in this study but unambiguous in the aforementioned studies.

Hypothesis 3 explored the link between individual difference in dispositional traits and cooperation. However, previous work is rather mixed with regards to the stability of the association between dispositional empathy and other-regarding behaviours. Cohen (2010) used samples of undergraduates and MBA students and found that dispositional empathic concern was consistently related to disapproval of unethical practices but not related to dispositional perspective taking. In contrast, dispositional perspective taking was associated with negotiation performance but dispositional empathic concern was not (Galinsky, Maddux, Gilin, & White, 2008). Therefore, whether dispositional empathic concern, "empathy" here, tends to produce more cooperation is still unknown or at least in the present study, there is insufficient basis on which to conclude anything definitively. Similarly, the same argument extends to failing to uncover an association between narcissistic personality and cooperative behaviour in the PGG. The inconclusiveness of the results here suggests utilizing these tools in further studies.

3.6. Conclusion

In conclusion, the design of Study 1 failed to support the empathy-cooperation link, which has been demonstrated in previous studies. There are several reasons why this may have been the case. The most obvious of which is that the target of empathetic concern, which in previous studies has been easy to identify during the PGG, was not obvious in the present version of the PGG. Participants could have

directed their empathetic concern to all three other players - by increasing their contributions to the group pot, though they may not have intended to, because they may have had a preference to direct their empathetic concern to only one other member of the group. Moreover, there was no evidence that there was an association between dispositions (empathy, lack of empathy [narcissism]) and cooperative behaviours in the PGG.

The gap between Study 1 and previous studies sets forth a strong incentive to conduct further studies, and raises a critical issue of whether or not the empathy-cooperation link is in fact a reliable link. Therefore, Study 2 is designed to further explore the empathy-cooperation link, but extending the paradigm to explore the role of values, such as the social cues discussed in this chapter, are thought to play in motivating cooperation.

Chapter 4 Study 2: The Role of Empathy on Cooperation when Personal Values are Introduced

Summary of Chapter 4: The previous chapter presented work regarding the first of four studies within this thesis. Study 1 was designed to examine the role of empathy (high-empathy, low-empathy and no-empathy) on cooperative decision-making in a linear public good game (PGG). Because the findings were inconsistent with previous work that have established this link, follow up work is needed to examine the extent to which other factors may affect the empathy-cooperation link. Therefore, Study 2 is designed to explore how empathy and personal values jointly influence cooperation using a similar paradigm to the one used in Study 1. The research hypotheses in Study 2 are presented as follows: Hypothesis 1): there should be a main effect of empathy induction on cooperative behaviour in the PGG; Hypothesis 2): personal values affect cooperation; Hypothesis 3): There should be a main effect of "interactive deception" on cooperative behaviours in a social dilemma game.

The main questions Study 2 addresses are: Are the personal values of others a relevant cue when thinking about cooperating, and to what extent do values and empathizing with others support cooperative behaviours? To address these issues Study 2 presented participants (N = 120) with details of the personal values (predominately social values [e.g., family, friends] or predominately economic values [e.g., phone, bike]) that three other players of a linear PGG purportedly had. In addition, half those tested were induced to empathize with the other players; they were presented with perspective-taking instructions (high-empathy condition) just as in Study 1, while the other half were not given any empathy induction instructions

(no-empathy condition). For those that believed they were interacting with real players in a cooperative game (n=70) values did indeed seem to matter. Participants acted more cooperatively in the social value condition as compared to the economic value condition when the empathy induction method was implemented. However, empathy induction (perspective-taking instructions) in and of itself made little difference to levels of cooperation, and in fact only made a difference by minimally reducing the use of the *generalized tit-for-tat strategy* in the game.

4.1. Introduction

The aim of Study 2 was to further explore the empathy-cooperation link, while also exploring the role of a factor that has been identified as important in supporting pro-social behaviours, that is, the value that people signal as important in social exchanges. As mentioned in the previous chapter, dispositional social values orientation refers to those values that are critical to social interactions, and for which there are individual differences, i.e. some prioritize other-regarding qualities more than others (Bogaert, et al., 2008, p.453). This in turn has been shown to be associated with cooperation, and may be a mediating factor in the empathy-cooperation link. Therefore the main aim of Study 2 was to examine the extent to which the values signalled by members of the group (either predominately socially oriented or economically oriented) would lead to increases in cooperative behaviour in a PGG in the presence as well as the absence of empathy induction. Study 2 examined three hypotheses.

Hypothesis 1 was essentially designed to further explore the findings from Study 1. Given that Study 1 failed to reveal a strong empathy-cooperation link, the aim of Study 2 was to streamline the design of the experiment, in order to provide a better opportunity to expose the empathy-cooperation link. This was achieved by

simply focusing the comparison between high empathy induction instructions and the effects on cooperation against a condition in which no empathy induction instructions were provided.

Hypothesis 2 examined the impact of other cues on cooperation, in particular the role of personal values in cooperative behaviour. Values are commonly considered as "relatively stable individual preferences about desirable states and behaviour that reflects socialization" (Bilsky & Schwartz, 1994, p. 164). In addition, personal values consist of social, economic, theoretical, aesthetic, political and religious values (Vernon & Allport, 1931). A large body of research has demonstrated that there is a strong relationship between people's personal values and their personality type, as well as the decision making strategies they implement (Bilsky & Schwartz, 1994; Olver & Mooradian, 2003; L. Parks & Guay, 2009). Bardi and Schwartz (2003) speculate that identifying personal values could be used as a way to gauge the extent to which people will behave well socially. For example, providing information about one content domain of values (e.g., religiosity) influenced corresponding relevant behaviour in another domain (Schwartz & Huismans, 1995). Moreover, in reference to the connection between values and cooperation, some researchers have focused on the role of cultural values on cooperative behaviours (Probst, Carnevale, & Triandis, 1999). What is more, legitimacy values and moral values were considered to motivate cooperation (Tyler, 2010, pp. 34-38).

A highly influential body of research has shown an association between individual difference, based on personal values (specifically social value orientation (Van Lange, 1999) involved "individualists" or "pro-socials" (Simpson, 2004)), and levels of cooperation (Balliet, Parks, & Joireman, 2009; Bogaert, et al., 2008). The majority of these studies suggested that pro-socials behaved more cooperatively than

pro-selfs. Pro-socials and pro-selfs are distinguished on the basis of the measurements of peoples' social value orientation.

In contrast, relatively few studies have examined the extent to which value information could affect individuals' cooperative decision-making behaviour. For instance, Volk, Thöni, and Ruigrok (2011) measured the extent to which personal values were associated with levels of cooperation in a social dilemma game. They found that individuals who highly valued pro-social values (e.g. equality) were more likely to cooperate than free ride. If, as implied by Volk et al's (2011) study, personal values signal pro-sociality, then this indirectly provides evidence for a potential link between the actual values that people hold and their cooperative behaviour. If so, then the prediction would be that by manipulating the types of values (economic – i.e. selfish, social – i.e. pro-social) shared by a group, this in turn should impact on rates of cooperation in a social dilemma game, such as a PGG.

Hypothesis 3: Here the aim is to further explore the issue of introducing deception in a social dilemma game, and the extent to which the pattern of results found in Study 1 would be replicated. In the present version of the PGG, there are three virtual players and only one real participant involved in each experimental set up, just as in Study 1. The reason for using fictional players was to allow for careful control of the range of empathic experiences that would impact on real participants' behaviour during the PGG. Nevertheless, to keep the experimental set up as close to real as possible, the contributions that the virtual players' made, though pre-programmed, were based on data obtained in a real four player PGG experiment (Fehr & Gächter, 2000). Experimental designs such as the one adopted in the present study involve a critical issue regarding "interactive deception"; this means participants are deceived into believing that they are interacting with genuine participants. Typically

what is done is that several participants are placed into the same room and play a game at the same time, to give the illusion they are actually interacting with the others in the room, but in actual fact they are not (Rand, Greene, & Nowak, 2012, study 7). In other cases, studies used programmed strategy or pre-design strategies to mimic real players while participants played a prisoner's dilemma games (Batson & Ahmad, 2001; Batson & Moran, 1999; Rumble, et al., 2010). Similarly, Kurzban and Houser (2005) used a pre-designed 10-round PGG in order to create a realistic set-up for participants; this also involved interactive deception. Moreover, research on *tit-for-tat strategy* and proof of its success as a strategy is often explored using computer tournaments (Axelrod & Hamilton, 1981). Thus, the experimental design used presently makes it possible to validly measure the role of empathy and cooperation. However, one critical difference between these past studies and the present study is that a measure of awareness of "interactive deception" was included, just as in Study 1. This measure was used to gauge the extent to which it differentially impacts on cooperative behaviour in an iterative PGG. Recall that in Study 1 the evidence revealed that belief/lack of belief in interacting with other players in the game did not impact overall contributions in the PGG, but did impact the contributions made in the first round. Therefore, clearly it is important to record the extent to which participants detect the deception as a basis on which to analyse the data, which most studies employing this type of deception do not do.

In summary, the aim of Study 2 is to examine two unexplored issues in the domain of cooperation. Hypothesis 1): there should be a main effect of empathy induction on cooperative behaviour in the PGG; Hypothesis 2): to investigate the role of the values on cooperative behaviours in a PGG or not were examined; Hypothesis 3): to examine the effects of interactive deception on cooperative behaviours in a

social dilemma game. If personal values serve as cues to cooperation, which people use to inform their decisions to cooperate (Keltner, et al., 2014; C. D. Parks, et al., 2013), then when the group shares values that are social values, this should elicit higher levels of cooperation than when the group shares economic values. In Study 2, values were signalled through stories of suffering in which the cause of suffering was social or material. To the best of my knowledge, Study 2 is the first ever attempt to explore the role of personal values, through this method, as a way to examine the impact of values on cooperation. Based on prior work, I predict that social value information will promote people to behave more cooperatively than those conveying economic values. In addition, given the design used, Study 2 also aimed to explore the impact of interactive deception on cooperative behaviour. The objective here is to provide important insights regarding work that adopts similar methodologies that lead to interactive deception, but that have yet to examine the behavioural impact of this method.

4.2. Method

4.2.1. Participants

Study 2 included 120 participants (80 female and 40 male) in four conditions of 30 participants each. Participants were recruited from Queen Mary University of London via email announcements and posted fliers. Participants were aged between 18 and 49 (M = 22.09, SD = 4.94). They provided informed consent prior to participation. On completion of the experiment, participants received between £6 and £15 based on their performance in the linear PGG (25 tokens = £1). When debriefed, all participants were asked whether they believed they were interacting with three other players online. Forty-nine participants reported they did not believe they were

interacting with three other real players, and one participant reported that he was not sure. The Ethics Committee of Queen Mary University of London approved this research study (QMREC1190).

4.2.2. Design and Materials

This experiment was a 2 × 2 (Value [social value, economic value] × Empathy [empathy, no-empathy]) between-subjects design, and participants were randomly allocated to one of the four experimental conditions. The critical dependent variable was the number of tokens participants contributed to the common pot on each of the 10 rounds, which is also the operational definition of cooperation in such economic game.

Study 2, just like Study 1, recorded other details in a set of questions given before and after the study. The pre-task questions included questions on personal information (age and gender), and questions concerning the participant's positive and negative experiences over the past year. Participants were also presented with the Interpersonal Reactivity Index (IRI) (Davis, 1983) questionnaire which is used to measure their dispositional empathizing ability, and consists of four subscales: perspective taking (PT), empathic concern (EC), personal distress (PD) and fantasy (FT). Unlike Study 1, Study 2 did not examine the link between dispositional narcissism and cooperative levels. The reason for this was that Study 2 was focused on examining the empathy-cooperation link, and given that dispositional empathy did not yield any significant results, it was deemed even less likely that dispositional narcissism would, and so to streamline the study, only dispositional empathy was included.

The participant's photo was taken using a phone camera and uploaded on-screen along with photos of the three virtual players; these steps were designed so that

participants believed they followed the same procedures as the other three players they were interacting with online. The details of the profiles were based on a published value survey (Osman, 2014). The most common values were predominately non-materialistic which formed the Social Value condition (e.g., family, friends, health; 86%, 45% and 30%, respectively), with the least common, predominately materialistic, values (e.g., mobile phone, bicycle, pet; 3%, 3%, 3%, respectively), forming the Economic Value condition. The profiles of the three virtual players were matched on the basis of number of words of the personal events. Below is the profile from a virtual player in the Social Value condition in which theme was "friend":

> *I speak to my best friend nearly every day. She is the closest person to me outside of my family. Recently we fell out. This isn't the first time that this has happened, and I know that we can fix this, but it is still upsetting.*

Below is the profile from a virtual player in the Economic Value condition in which the theme is "phone":

> *I speak on my mobile phone nearly every day. It is the object most close to me other than my laptop. Recently I broke my phone. It fell out of my bag. This isn't the first time that this has happened, and I know that I can fix this, but it is still upsetting.*

The PGG was carried out via a computer using E-prime 2.0. In the PGG program, the number of tokens the three players contributed on each round was fixed, and the same for each participant. The number and variance in the tokens contributed was based on Fehr and Gächter (2000) study's using average contributions (taking into account the standard deviation) in their partner-treatment without punishment condition. The combined total contribution of the three other players on each round was as follows: 27, 34, 31, 24, 22, 23, 24, 18, 12 and 10; identical to Study 1.

The post-task questions recorded participants' impression towards the three other virtual players on a 9-point scale, ranging from 1 (*not at all*) to 9 (*very much*), based on the extent to which they empathized with each of them. In addition, participants were also required to rate, on the same 9-point scale, the extent to which their personal values related to those of each of the three other players.

During the debriefing session participants were asked if they thought they were interacting with real players online or not, whether they knew the other players, and what strategies were used. They were then debriefed about the experimental set up.

4.2.3. Procedure

Each participant was tested individually in a soundproofed experimental cubicle facing a computer monitor. After signing the consent form and reading the information sheet, participants filled in the pre-task questions, and their photos were taken. Participants were then asked to wait for approximately 5 minutes and told that this time was needed to coordinate the other players that were taking part in the experiment, where the interactive deception was involved. During this time participants were told to carefully read the instructions for PGG.

Before participants took part in the PGG task, they were presented with their own picture, alongside the three other players' pictures and were told that they were playing the game with these three people. Then the Empathy condition was presented with the empathy induction procedure. They were told: "Next you will see profiles of the three other participants who will work together with you. While you are reading these, try to imagine how the person felt about what they have just described. Try to imagine how it has affected them and how they feel as a result". In the no-empathy condition, they were shown the other three profiles and simply told: "Next you will

see profiles of the three other participants who will work with you.". Participants then started the PGG. For each round, participants were first presented with the index of the round number, for example, "This is Round 2". Next, participants were required to decide how many of their 20 tokens to contribute to the group pot. At this time the three others players' pictures were also presented. After they had made their decision, they entered their choice into the computer. Next, they were required to wait between 4 to 12 seconds, as randomly determined by the program. Then feedback was presented in exactly the same manner as in Study 1, including "Other people contributed tokens: (the sum of three other players' contribution), Your contribution this round is: (the number of tokens they contributed), Your share of the pot for this round: (the number of tokens they received from the pot), Your total number of tokens on this round: (the total number of tokens they will receive on that round), and Your cumulative total of tokens across rounds: (the total number of tokens they will receive across all rounds)". Participants were required to copy down those values into the form using pencil and paper provided. The reason for this was to make sure that participants attended to all the feedback information presented on screen on each round. When they completed all this, they were required to press space key to continue to the next round. This procedure was repeated until all 10 rounds were complete.

On completion of the PGG, participants were then presented with the post-task questions, which included self-reporting on empathizing and similarity; this was then followed by the IRI. Finally, participants were fully debriefed about the study and its purpose.

4.2.4. Scoring

With regards to scoring for the IRI empathy questionnaire, the four subscales (PT, PD, FS and EC) were scored individually. Each subscale consisted of 7 items; with some items reverse scored (item 3, 4, 7, 12, 13, 14, 15, and 19). Specifically, PT comprised of items 3, 8, 11, 15, 21, 25, 28; PD comprised of items 6, 10, 13, 17, 19, 24 and 27; FS comprised of items 1, 5, 7, 12, 16, 23 and 26; EC comprised of items 2, 4, 9, 14, 18, 20 and 22. Similarity and Empathizing were scored according to the rating in the post-task questions, and ranged from 1 (*not at all*) to 9 (*very much*).

4.3. Results

The results section is divided as follows: First self-reported similarity and empathizing scores are presented, then analyses of the rates of contribution in the PGG are presented, along with analyses of the frequency of *generalized tit-for-tat strategy* in each of the four conditions. Finally, a regression analysis is used to examine the potential association between first round's contribution in the PGG and dispositional empathy ability.

4.3.1. Self-report Empathy and Similarity

To begin with, the analyses examined if there were group differences based on self-report similarity and self-report empathy of participants' personal values, and those of the three other players in the social value and economic value conditions. There were no significant differences for self-reported similarity between the four conditions. In terms of self-reported empathy, based on the three profiles that participants read of the other group members, there was a significant interaction between value and empathy. This suggests that in the high-empathy condition, self-reported empathy in the economic value condition (M = 5.09, SD = 17.63) was lower

than in the social value condition (M =6.33, SD = 17.63), F(1,116) =7.48, p = .007, η_p^2 = .061.

4.3.2. PGG: First Round

In the first round, the mean of contribution rate was 0.52 (SD = 0.30), 95% CI [0.47, 0.58], which was located at the interval of 40% ~ 60% of the overall personal endowments. At this stage in the PGG (N = 120) the value manipulation did not impact on the number of tokens contributed, F(1, 116) = .435, p = .511, η_p^2 = .004, and neither did the induction of empathy, F(1, 116) = 2.89, p = .09, η_p^2= .024. There was also no significant interaction between value and empathy on first round contributions, F(1, 116) = 0.001, p = .99, η_p^2 <.0001.

4.3.3. PGG: All Rounds

Contributions made in each round by each participant were entered in a 2 × 2 × 2 × 10 Value [social value, economic value] × Empathy [empathy, no-empathy] × Deception [deception success, deception failure] as the between-subject variables × Round [round 1-10] as the within-subject variable) mixed ANOVA to examine the main manipulations of the study. The Mauchly's test indicated that the assumption of sphericity had been violated, χ^2 (44) = 166.63, p <.001, therefore Greenhouse-Geisser corrected tests were reported (ε = .71).

Table 9A shows the mean contribution of tokens for the four conditions. The analyses revealed a marginally significant 10 Round × Value × Empathy × Deception four-way effect, F(6.42, 712.38) = 55.95, p =.059, η_p^2 = .018. Apart from this, all other analyses failed to reach significance. Further analyses were conducted based on classifying participants according to whether they believed they were interacting with

three other players online into deception success group (n = 70) and deception failure group (n = 49) for further analysis.

In terms of the deception success group (n = 70), a 10 × 2 × 2 (Round [round 1-10] × Value [social value, economic value] × Empathy [no-empathy, empathy]) repeated-measures ANOVA was conducted. As shown in Table 9B, there was a significant interaction between Value × Empathy, $F(1, 66) = 6.782$, $p = .011$, $\eta_p^2 = .093$. A post-hoc power test was calculated by G*power (http://www.gpower.hhu.de/en.html), ($1- \beta = 1.00 > .80$). Pairwise comparisons showed that in the empathy condition, there was a significant difference between the economic value condition and the social value condition, $p = .004$, $\eta_p^2 = .118$; not found in the no-empathy condition, $p = .736$, $\eta_p^2 = .002$, which indicates that when empathy was induced, for those presented with social values stories, contributions were higher than for those that received value stories regarding economic values.

Table 9*A. The Mean Contribution for the Four Conditions (N=120); B. The Mean Contribution for the Deception Success Group (n=70); C. The Mean Contribution for the Deception Failure Group (n=49)*

A The Mean Contribution for the Four Conditions (N=120)

Value	No-empathy			Empathy		
	M (*SD*)	*n*	95% CI	*M* (*SD*)	*n*	95%CI
Economic value	9.95(4.86)	30	[8.19, 11.71]	6.47(7.61)	30	[3.73, 9.23]
Social value	9.53(4.39)	30	[7.94,11.13]	9.82(3.93)	30	[8.40, 11.24]

B *The Mean Contribution for those Deception Success Group (n=70)*

Value	No-empathy			Empathy		
	M (*SD*)	*n*	95% CI	*M* (*SD*)	*n*	95% CI
Economic value	9.44 (3.00)	24	[8.21,10.66]	6.73 (4.25)	22	[4.92, 8.54]
Social value	9.14 (2.04)	11	[7.86,10.42]	10.38 (3.00)	13	[8.71,12.04]

C *The Mean Contribution for those Deception Failure Group (n=49)*

Value	No-empathy			Empathy		
	M (*SD*)	*n*	95% CI	*M* (*SD*)	*n*	95% CI
Economic value	10.47 (4.91)	6	[6.42,14.51]	9.71 (4.90)	17	[7.31, 12.11]
Social value	9.93 (4.91)	8	[6.43,13.43]	9.37 (4.91)	18	[7.04,11.71]

The main effect of round was significant, $F(6.24, 411.86) = 9.98$, $p < .001$, $\eta_p^2 = .13$, $(1- \beta = 1.00 > .80)$, suggesting that overall contributions dropped over round, which is a typical effect in the PGG literature. The analysis also found a marginally significant interaction between round × empathy, $F(6.24, 411.86) = 1.92$, $p = .073$, $\eta_p^2 = .028$, $(1- \beta = .976 > .80)$. Pairwise comparisons showed that there was only a significant difference between the no-empathy condition ($M = 10.97$, $SD = 4.63$, 95% CI [9.41, 12.54]) and high-empathy condition ($M = 8.07$, $SD = 6.42$, 95% CI [5.90, 10.24]), for the first round contribution, $p = .034$, $d = 0.52$.

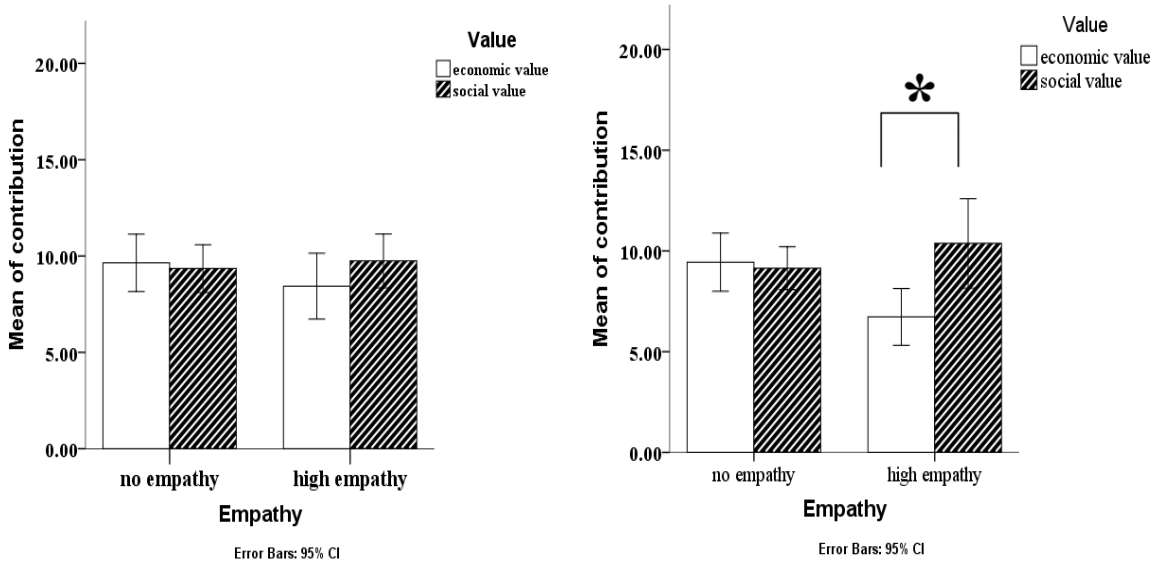

Figure 12. A. Average contributions in four conditions for all data (*N*=120); B. Average contributions in four conditions for deception success group (*n*=70); (the left figure is A and the right figure is B, the same rule applies for the following figures in this thesis.).

Turning now to the deception failure group (*n*=49), while it is hard to interpret the behaviour of this group, their pattern of contributions does provide some interesting insights. In Study 2 the tokens at the end of PGG converted into real money. Therefore rationally, the deception failure group should consistently make zero contributions in every round because pro-sociality is dis-incentivized as they believe they are not interacting with real players. However, just as in Study 1, in Study 2 the social nature of the PGG set up appears to have encouraged the deception failure group to contribute reliably above zero (M = 9.71, SD = 4.77, $t(48)$ = 14.25, p < .001), as shown in Table 9C. A repeated-measures ANOVA was performed on the deception failure group across 10 round PGG and first round PGG data, with no significant main effect or interactions.

4.3.4. Generalized Tit-for-tat Strategy

To test the effect of the main manipulation (empathy & values) on the frequency of employing the *generalized tit-for-tat strategy*, a loglinear analysis was

performed on the number of participants using the strategy in each condition. Prior studies suggest that the *tit-for-tat strategy* is a common strategy employed in social dilemmas such as the prisoner's dilemma; the *generalized tit-for-tat strategy is the matching strategy in PGG*. Therefore, contributions of the participants from 2nd to the 10th round were correlated with the mean contributions of the three other players' from 1st to 9th round. If the correlation is significant, those players were classified as using *generalized tit-for-tat strategy*, and if it is non-significant, those players were classified as using *other strategy*. Table 10 shows the number and proportion of people using the *generalized tit-for-tat strategy* in each condition. A log-linear analysis revealed more participants were classified as using the *generalized tit-for-tat strategy* in the no-empathy condition as compared to the empathy condition, Z = 2.815, p = .005 (N =120); Z = 2.926, p = .040 (n=70). While the empathy induction manipulation did not lead to increases overall in the contributions made in the PGG, it did affect the types of strategies that participants employed and discouraged *generalized tit-for-tat* usage.

Table 10 A. *The Number and Proportion using Generalized Tit-for-tat Strategy in Four Conditions (Value × Empathy) (N=120); B. The Number and Proportion using Generalized Tit-for-tat Strategy in Four Conditions (Value × Empathy) for the Deception Success Group (n=70)*

Value	No-empathy	Empathy
Economic value	11/30 (36.67%)	5/30 (16.67%)
Social value	11/30 (36.67%)	3/30 (10%)

Value	No-empathy	Empathy
Economic value	10/24 (41.67%)	2/11 (18.18%)
Social value	10/22 (45.45%)	2/13 (15.38%)

4.3.5. Regression between PGG and Empathic Disposition

To test for an association between dispositional empathy and contribution rates in the PGG, a Linear Regression analysis was carried out on the first round contribution, age and the score of subscales (PT, PD, FS, EC) of the IRI. As seen from Table 11, none of subscales of the IRI predicted first round contributions in the PGG for the deception success group.

Table 11A. *Summary of Hierarchical Regression Analysis for Variables Prediction Contribution in First Round of PGG for Deception Success Group (n=70); 11B. Summary of Hierarchical Regression Analysis for Variables Prediction Contribution in First Round of PGG for Deception Failure Group (n=49).*

Variables	B	SEB	β	95% CI
Step 1				
Age	-.051	.202	-.037	[-.458, .355]
Step 2				
Age	-.131	.250	-.094	[-.636, .374]
PT	.938	.806	.186	[-.688, 2.564]
PD	-.346	.745	-.079	[-1.848,1.156]
FS	.105	.648	.026	[-1.202,1.413]
EC	-.1.342	1.471	-.197	[-4.308,1.625]

Note. R^2 = .001 for step 1; ΔR^2 = .0054 for step 2. * $p < .05$;

Variables	B	SEB	β	95% CI
Step 1				
Age	-.058	.190	-.044	[-.439, .323]
Step 2				
Age	-.118	.191	-.091	[-.503, .266]
PT	.384	1.425	.040	[-2.489, 3.256]
PD	3.608	1.520	.374*	[.543, 6.673]
FS	.084	1.190	.011	[-2.316, 2.484]
EC	-3.355	1.870	-.279	[-7.126, .417]

Note. R^2 = .044 for step 1; ΔR^2 = .141 for step 2. * $p < .05$;

4.4. Discussion

As well as replicating Study 1, Study 2 was also designed to examine potential relevant cues that could influence cooperation, in an online interactive social dilemma game (PGG). To this end, Study 2 found that, consistent with Study 1, the empathy induction manipulation did not, in and of itself, lead to increases in cooperation relative to the no-empathy condition, but it did impact on the types of strategies that were employed in the PGG. In addition, Study 2 found that values, for those that believed that they were interacting with real players online, did impact on cooperative behaviours in the PGG, when there is perspective taking instruction. In particular, when participants were interacting with players that were revealed to have predominately social values, contributions were higher than those interacting with players that had mostly economic values. This supports Hypothesis 2. Also, consistent with evidence from Study 1, Study 2 found that participants contributed to the pot even though they did not believe they were interacting with real players.

Again, as with Study 1, Study 2 failed to find an empathy-cooperation link, posited to be the result of presenting a social dilemma task without face-to-face interactions, thought to be important for empathy to take effect (Batson & Moran, 1999; Rumble, et al., 2010; Xu, et al., 2012). In Study 2 the empathy manipulation was identical to other studies that have demonstrated enhanced effects on pro-social behaviours, which is why it is more likely that the mixed findings are a result of differences concerning the PGG procedures, rather than the fact that empathy *per se* is less effective as an emotional cue when interacting online. In Studies 1 and 2 participants were asked to decide the amount of tokens they would contribute to the group pot, whereas in previous studies participants could decide to contribute their tokens to a group pot, or an individual player. This may be a critical difference

because when empathy was induced in Batson, Batson, et al. (1995)'s study, participants increased their cooperation for the target player they most empathized with, which was not possible in the present study.

In Study 2 participants were presented with details of the personal experiences of the other players and so could, in theory, empathize with this, and reveal their pro-social tendencies by cooperating more overall. While empathy did not reveal itself in cooperative behaviours *per se*, those induced to empathize were less likely to use the *generalized tit-for-tat strategy* is often relied on as an efficient and defensive means of guarding against betrayal of pro-sociality (Komorita, Parks, & Hulbert, 1992). Moreover, this study explored dispositional empathy ability as a predictor of first round contributions in the PGG; however, only weak evidence for a connection was found. Again, this may be the result of the procedures adopted in the PGG, or because there is an unstable association between empathy and cooperation when interacting with others online.

Secondly, Study 2 did find evidence to suggest that signalling pro-social behavioural dispositions online is a useful cue that participants use to determine the extent to which they cooperate, consistent with Parks' Integrated Model (C. D. Parks, et al., 2013). As previous work has shown, if one is provided with information that reveals pro-social behaviours such as trustworthiness (Stave, 1983), cooperative behaviour with strangers increases. While this study is the first of its kind to provide evidence of the mediating role of values in a linear PGG, it lends further support to the work of Volk, et al. (2011) which suggested that values do play a role in cooperation. One question that those findings raise is what role values play for determining cooperative behaviours in the PGG. Given that the overall pattern of contributions decays over rounds, which is consistent with previous studies of PGG

(Ledyard, 1994), one way of conceptualising the role of values is that signalling social values reduces the decay, relative to signalling economic values. Thus, the findings from the present study limit claims that signalling materialistic values *per se* is a way of increasing cooperation overall, at least for the linear PGG. In order to support this claim, further studies using the PGG would have to show that participants (either interacting with real or virtual players) make higher contributions systematically across rounds when not providing any information in contrast to providing information signalling economic values.

In line with standard economic versions of the linear PGG based on recommendations by economists and psychologists (Hertwig & Ortmann, 2001) Study 2, as with Study 1, used real financial incentives rather the fixed payments or credits. However, Studies 1 and 2 introduced a form of social-interaction-deception, "interactive deception", as participants were led to believe they were interacting with real players. Even though this was present, Study 2 revealed that, compared with other studies, overall first round contributions were within the standard 40% ~ 60 % range of endowments (Ledyard, 1994). This suggests that the decision making behaviour that was observed was in line with previous economic studies that involve genuine (though typically not direct face-to-face) interactions with real players. Nevertheless, to examine the impact of interactive deception on decision-making behaviour participants were asked if they did indeed believe they were interacting with real players, and only a small proportion did not. What is curious is that these participants continued to make contributions knowing that they were not interacting with real players, when the rational strategy would be to contribute nothing on each round. One explanation for this is that participants were subject to social desirability bias, as speculated in Chapter 3, which is the tendency to present oneself in a positive

social manner to be accepted by others (Edwards, 1957; King & Bruner, 2000). Despite this, 58% of participants in Study2 who indicated that they believed they were genuinely interacting with real players, revealed observable patterns of behaviours consistent with the prediction in Study2. Future studies that include manipulations such as the ones used here should include checks to identify if participants are aware of the presence of deception, whatever kind is used.

4.5. Conclusion

Overall, Study 2 showed that signals of social values as compared to economic values maintained cooperation in a social dilemma game when there were perspective-taking instructions designed to induce empathy. Moreover, empathy reduced the likelihood of a typical reciprocal strategy (*generalized tit-for-tat*). Taken together both Studies 1 and 2 suggest that empathy is a weak method for increasing cooperative behaviours, but that in combination with other factors, such as signalling of pro-sociality through personal values, does at least maintain reasonable levels of cooperation in a PGG. Given this, the aim of Study 3 was to further explore other factors that can, in combination with induced empathy, increase cooperation in a PGG.

Chapter 5 Study 3: The Empathy-cooperation Link in PGG with Heterogeneous Group Setting

Summary of Chapter 5: This chapter presents Study 3 consisting of two experiments (Experiments 3a, and 3b), both designed to further explore the empathy-cooperation association, with a focus on status. Whereas Study 1 focused on purely establishing a link between empathy and cooperation, and Study 2 aimed to replicate and extend the findings from Study 1, Study 3 now builds on this work to explore the extent to which empathy impacts on cooperative behaviours when the status between individuals in a social dilemma game is manipulated. By focusing on status, the aim is to look at the way in which different types of social structures impact on behaviour in a social dilemma game, and whether in fact empathy can have a significant impact in supporting cooperative behaviours.

The following hypotheses were examined in Study 3 in which social status was manipulated: Hypothesis 1: The low-status group is more dependent than those in the high-status group in the community; therefore, the low-status group will show greater levels of cooperation, irrespective of the inducement of empathy; Hypothesis 2: There should be greater cooperation in groups that have achieved their status through chance (Experiment 3A) than through efforts (Experiment 3B); Hypothesis 3: According to the empathy-altruism hypothesis, empathy induction will promote cooperation; Hypothesis 4: Those with higher empathic disposition will make higher first round contributions in a linear public good game (PGG); Hypothesis 5: Empathy induction will reduce the likelihood of using *generalized tit-for-tat strategy*.

Study 3 considered the extent to which empathy mediates cooperative behaviours when individuals' status within group (i.e. having more [high-status] or

less [low-status] resources than their group members) is either determined by chance or effort. The general method employed in Study 3 was similar to both Studies 1 and 2. Study 3 involved one real player and three virtual players taking part in a linear PGG. The findings from Experiment 3A and 3B showed that, regardless of whether individuals were endowed with their status (Experiment 3A chance-status) or earned their status (Experiment 3B effort-status), individuals in high-status conditions devoted a lower proportion of contributions (PoC) than their low-status counterparts, which suggests that the high status group behaved less cooperatively than the low status group. Empathy in and of itself did not lead to increases in PoC but did maintain PoC for the low-status group when status was determined by effort (Experiment 3B effort-status). Overall, the results from Study 3 suggest that empathy-induced altruism is a weak motivator of cooperation in a group setting when financial incentives are made especially salient.

5.1. Introduction

Equality of opportunity can be determined by *chance* or determined by *effort*; that is, *ceteris paribus* (all else being equal) the opportunity for gaining resources is through chance factors, which all members of a group are exposed to, or through achieving more resources through effort alone. To what extent is successfully promoting pro-social behaviours dependent on the way in which status is achieved through chance or effort? This empirical question forms the basis of Study 3. As mentioned in Chapter 1, pro-social behaviour is a broad category of acts that are agreed on by a significant segment of society or one's social group, as generally beneficial to others (Penner, Dovidio, Piliavin, & Schroeder, 2005) with cooperation the most frequent pro-social behaviour. Status is a term that includes, but is not limited to, constructs such as socioeconomic status (SES), social influence resource-

holding potential, and social class (Kafashan, Sparks, Griskevicius, & Barclay, 2014), the latter of which has been found to affect behaviours associated with social engagement (Cote, 2011; Kraus & Stephens, 2012).

Some experimental work suggests a link between how status is achieved and pro-sociality in terms of displays of cooperative behaviour. In equal opportunity via chance manipulations (Muehlbacher & Kirchler, 2009), tokens are randomly assigned by the experimenter to participants to mimic acquisition of wealth via inheritance (Komorita, et al., 1992) or via lotteries. Equal opportunity via effort is examined by assigning tokens based on performance on a specific task, which is designed to mimic situations in which access to greater wealth is achieved by meeting performance criteria in job settings (Kroll, Cherry, & Shogren, 2007a). Taken together, the general findings suggest that pro-sociality weakens when status is achieved through effort rather than by chance (Muehlbacher & Kirchler, 2009; Rockmann & Northcraft, 2008). While this work suggests that generally the basis on which status is achieved does in turn impact displays of pro-sociality, it does not speak on issues regarding the link between status and pro-sociality *per se*, which is also an important component for addressing the target question motivating this study.

One key motivation of Study 3 is to examine the link between status and pro-sociality, which Kafashan, et al. (2014) claim is functional in one of two ways, either pro-social behaviour can be used to help achieve status (Willer, 2009a), or possessing status can change the costs and benefits of engaging in pro-social behaviour. With regards to the latter, evidence suggest that low-status individuals are more likely to show pro-social behaviour than high status individuals when it comes to charitable donations (Bennett, 2012; Piff, Kraus, Côté, Cheng, & Keltner, 2010). Some work has looked at the extent to which this pattern of behaviour extends to other contexts such

as laboratory tasks, for instance, a linear public goods game (PGG) which consists of only one Nash equilibrium in which everyone contributes nothing and one Pareto efficient solution in which everyone contributes everything (Abele, et al., 2010). Here each of four players can choose to contribute a certain amount of their endowments to a common pot (i.e. an index of cooperation), which is distributed equally amongst all four players. In typical versions of the linear PGG each player is endowed with the same amount of tokens (homogenous set up). Heterogeneity, which can serve as a proxy for different levels of status, can be introduced via distribution of an unequal amount of tokens amongst players (Cherry, Kroll, & Shogren, 2005). Consistent with research on status and charitable donations, there is some evidence to suggest that low-status individuals (i.e. those endowed with less tokens than the group) contribute more than high status individuals (Piff, et al., 2010). Given that experimental manipulation of endowment heterogeneity in the PGG creates a lab-analogue of having low-status and high-status, a similar paradigm is used in the present study. Based on previous work assuming a functional relationship such that status affects the costs and benefits of pro-social behaviour, it is predicted that having low-status, regardless of the way of it was achieved (i.e. chance, effort), will lead to greater displays of pro-sociality through contributions to a public good. However, this manipulation alone does not tackle the issue of how to artificially promote pro-social behaviours in both low-status and high-status groups.

According to the theories presented in Chapter 2, different social statuses affect one's costs and benefits analysis with resultant changes in behaviour. Therefore, if changes occur to a person's relative status within a group, the proclivity for cooperative behaviour will change due to either the change of exchange of material resources or the relative identity they could potentially obtain. However,

these theories do not consider whether empathy induced altruistic motivation increases cooperation in such contexts. The empathy-altruism hypothesis (Batson, 2011) predicts that if people feel empathic concern for another group member, altruism will be motivated towards them.

To address the main objective of Study 3, and to examine many of the outstanding empirical questions raised by research examining equal opportunity, status, cooperation and empathy, two experiments were conducted for Study 3 to explore the role of empathy when the endowments were heterogeneous and the origin of status were manipulated. Each experiment (Experiment 3A, Experiment 3B) assessed the extent to which empathy influenced cooperative behaviour in an iterated linear PGG. Cooperation was indexed by proportion of contributions (PoC) to a community resource in one of three modes of equality. Experiment 3A (chance-status) assessed behaviour under conditions in which status was determined by *chance* (i.e. a draw of a ball from a box with equal distribution of red and blue balls). Experiment 3B (effort-status) assessed behaviours when status was determined by *effort* (i.e. performance on a cognitive test of executive functioning), again in which there was equal opportunity but unequal resources.

The following five main hypotheses are made for Study 3: Hypothesis 1) based on the resource exchange theory (H. H. Kelley & Thibaut, 1978), the low-status group will be more dependent on the community than those in the high-status group; therefore, the low-status groups will show greater levels of cooperation, regardless of the inducement of empathy; Hypothesis 2) there will be greater cooperation in groups that have achieved their status through chance than through effort; Hypothesis 3) according to the empathy-altruism hypothesis (Batson, 2011), inducing empathy towards the suffering of others will promote cooperation in Study 3; Hypothesis 4)

those with higher empathic disposition will make higher first round contributions in the PGG (Here empathic disposition in general is measured using a subscale of the Interpersonal Reactivity Index (IRI), though Studies 1 and 2 have failed to show this); Hypothesis 5) empathy induction will reduce the likelihood of using *generalized tit-for-tat strategy* (Axelrod & Hamilton, 1981), because *generalized tit-for-tat strategy* is considered as the most effective strategy for egoists (consistent with the findings from Study 2). This strategy tends to produce more overall personal gain than a strategy of relentless defection, even though defecting is optimal on each individual trial (Axelrod, 1984).

5.2. General Method

5.2.1. Overview

Study 3 comprised of two experiments, in which real participants were exposed to a series of 10 rounds in a linear PGG while interacting with three fictional players, just as in Studies 1 and 2. The assignment of participants to the key experimental conditions (high-status vs. low-status) in Experiment 3A was based on a random draw of a coloured ball picked from an occluded black box (chance-status). In the black box there was one blue ball and one red ball, so the probability of their assignment to high-status or low-status group was 50%, respectively. Participants were assigned to the low-status condition if they picked the blue ball and the high-status condition if they picked the red ball. The endowment allocation distribution in the high-status was as follows: real player 30 tokens, fictional players each with 20 tokens, whereas that of low-status was: real player 10 tokens, fictional players each with 20 tokens. In Experiment 3B, participants were assigned to status conditions (high-status vs. low-status) according to their performances on a digit cancellation test

(effort-status). The endowment allocation distribution was the same as Experiment 3A. A prior power analysis was conducted using G*power (http://www.gpower.hhu.de/en.html) to infer the required sample sizes for this study (Faul, et al., 2007). Assuming the effect size of empathy is the medium effect (f = 0.25) suggested by Cohen, defined for between subject repeated-measures ANOVA (J. Cohen, 1988), the required total sample size is 72, when the power ($1-\beta = .8$).

These two experiments' data analysis followed the same structure. First, the analyses assessed the effectiveness of the empathy manipulation using a mixed repeated-measures ANOVA to examine the effects of empathy and status on cooperation using proportion of contribution (PoC) in the PGG. Next, the number and proportion of participants using a *generalized tit-for-tat strategy* across all conditions were examined to check whether the tendency to use a *generalized tit-for-tat strategy* was affected by the manipulation. Finally, a regression analysis was conducted to assess whether dispositional empathy measured by IRI predict the first round contribution in the PGG.

Experiment 3A

In Experiment 3A the aim was to examine the effects of empathy on cooperation in situations in which status (high vs. low) in the PGG game was achieved via chance.

5.2.2. Method (Experiment 3A)

5.2.2.1. Participants

Ninety-four volunteers (58 female and 36 male) were recruited from Queen Mary University of London via emails and fliers. The mean age of the participants was 20.71 years (range from 17 to 32; *SD* = 3.09). Based on the condition they were assigned to, they were given different final payments. In the high-status condition,

participants were paid between £10 and £15; in the low-status condition, participants were paid from £5 to £7.

All participants gave written informed consent prior to participation. After the experiment, they were paid an amount for their participation on the basis of the tokens gained in the PGG. In each PGG 25 tokens was equal to £1, which all participants were made aware of at the start of the experiment. The Ethics Committee of Queen Mary University of London approved the study (QMREC1190).

5.2.2.2. Design and Materials

Experiment 3A was a 2 × 2 (Empathy [high-empathy, no-empathy] × Chance-status [high-status, low-status] between-subject experimental designs. The critical dependent variable was participants' proportion of contributions (PoC) in each round of the PGG, which comprised 10 rounds in total. Participants' contributions from round to round were assessed. In addition, the experiment recorded other dependent measures in a set of questions given before (demographics, personal stories, hobbies) and after (dispositional empathy, estimates of similarity, estimates of empathy, believability of study, strategy development) the main task. The pre-task questions included questions regarding age and gender, the participants' positive (i.e. "Describe an event that has happened to you that has made you happy in the last year") and negative experiences (i.e. "Describe an event that has happened to you that has made you sad in the last year"), and their hobbies. Post-task questions consisted of rating scales to assess participants' judgements of similarity to, and empathy towards each of the three virtual players. The post-task questions recorded participants' impression (similarity, empathizing) towards the three other virtual players on a 9-point scale, ranging from 1 (*not at all*) to 9 (*very much*). Moreover, participants were also presented with IRI questionnaire, which is widely used to measure adults'

dispositional empathizing ability and consists of four subscales, Perspective Taking (PT), Empathic Concern (EC), Personal Distress (PD) and Fantasy (FT) (Davis, 1983). Participants' photos taken at the start of the experiment, using a phone camera, were uploaded on screen along with the photos of the three virtual players; these steps were designed to ensure that participants felt that all of the participants in the game were experiencing the same procedures, and were supposedly interacting live online. Finally, as with Studies 1 and 2, debriefing questions were presented to participants to assess whether they believed that they were interacting with three other players online, and whether they recognized the three other players.

The PGG was programmed and implemented via a computer using E-prime 2.0 software. The game was arranged such that each participant was playing with three other players whose actual profiles, included stories (regarding either negative events they experience, or their chosen hobbies) and photos, were prepared in advance; this method is often referred to as "interactive deception". In the high-empathy condition, the three other players' profiles referred to a negative event that had been experienced (Player 1 = a break up with a partner, Player 2 = a car accident, Player 3 = a stolen mobile phone), which to some extent can be categorized as social pain/psychological pain. In addition, participants were instructed on the empathy induction method, in the same way as in Studies 1 and 2. In the no-empathy condition, the profiles referred to neutral events (Player 1 = swimming, Player 2 = ride bicycle, Player 3 = running most mornings). There were no perspective-taking instructions as to how to read the profiles.

The assignment of participants to each experimental condition was carried out prior to the main experiment. This study involved a status manipulation, in which half of the real participants were endowed with 30 tokens (high-status) and the other half

were endowed with 10 tokens (low-status) on each round. All the three other virtual players were set to given 20 tokens per round regardless of high-status or low-status group. In this PGG program, the amount contributed by the three virtual players was fixed for all participants, in a similar way as Studies 1 and 2. Besides, to help the participant better understand their payoff in the experiment, an equation explaining the method of calculating their tokens per round was also presented to the participants before starting the public goods programs, e.g., $(30-?)+\frac{(?+?a+?b+?c)*(1+40\%)}{4}$ in the high-status condition and $(10-?)+\frac{(?+?a+?b+?c)*(1+40\%)}{4}$ in the low-status condition (? refers to the amount of contribution to the common pot).

5.2.2.3. Procedure

Each participant was tested individually in a soundproofed experimental cubicle facing a computer monitor. After reading the information sheet and signing the consent form, participants were required to pick a ball from a black box without looking inside and were told the colour of ball determined their group for the experiment. If they picked the red ball, the participants were assigned to high-status condition; if they picked the blue ball, they were assigned to low-status condition.

Next, the experimenter told the participant that since the experiment required them to work with three other players online together, they are required to do some preparation. "As we said in the information sheet, you are going to play this joint task with three other players online. Yet we cannot let you talk with each other, since we need to conduct this study under controlled conditions. What we do is exchange your profile with three other players. In order to do that, we need to collect your picture and some personal information." Having been informed of the confidentiality of their data, participants were asked to fill in the pre-task questions, and to have their photo

taken, with a neutral facial emotion, in front of a white wall background. Participants were then asked to wait for approximately 5 minutes and told that this time was needed to coordinate the other players that were taking part in the experiment. During this time participants were told to carefully read the instructions for the PGG. They were given the instructions that corresponded with the colour of ball they picked. In the high-status condition, they were instructed that they were to be given 30 tokens per round, whereas in the low status condition, the instructions informed participants that they were to be given 10 tokens per round.

The experimenter came back to the experimental cubicle after uploading the participants' picture to the computer running the PGG program. The experimenter asked the participants to describe their understanding of the instructions to demonstrate understanding of the task. Then the experimenter showed participants the three other players' pictures alongside their own picture. "These are the players you are going to play with. And you will see their profile in the program." To be more persuasive, the real participant picture was always the first picture presented, followed by the three other face photos. After entering some basic information (participant number, gender, age), they were presented again with instructions for the PGG program. They were then asked to wait again while the experimenter asked the other players to get ready. When the experimenter returned, after between 30 to 60 seconds, they were instructed to press the SPACE key to start the experiment.

In the PGG program, the high-empathy condition was presented with the empathy induction procedure. They were instructed: "Next you will see profiles of the three other participants who will work together with you. While you are reading this, try to imagine how the person felt about what they have just described. Try to imagine how it has affected them and how they feel as a result". In the no-empathy condition,

participants were instructed: “Next you will see the profiles of three other participants who will work together with you.” Participants were then consecutively presented with the picture and profile of each of the three players to read after which the PGG was started. For each round, when participants were required to decide on how many of their tokens to contribute, they were presented with the pictures of the three other players. In the high-status condition, it was from 0 to 30 tokens; whereas in the low-status condition, it was from 0 to 10 tokens. After they had made their decision, they entered their choice, and were required to wait between 4 to 12 seconds, randomly determined by the program. After which they were given feedback, “Other people contributed tokens: (the sum of three other players’ contributions); Your contribution this round is: (the number of tokens they contributed); Your share of the pot for this round: (the total number of tokens they will receive on that round); and Your cumulative total of tokens across rounds (the total number they will receive across all rounds)”. The program then moved on to the next round. This procedure was repeated until all 10 rounds were complete. Participants were required to copy down all the values presented in each round using a pen and the form provided. The reason for this was to make sure that participants attended to all the feedback information presented on the screen on each round. On completion of the PGG, participants were presented with the post-task questionnaires, and debriefed about the details of the study, its purpose and the interactive deception issue.

5.2.3. Results (Experiment 3A)

5.2.3.1. Empathizing Manipulation Check

For Experiment 3A, an independent-samples *t*-test was conducted on judgments regarding the extent to which participants empathized with the experiences of the other players they were interacting with in the PGG, in the no-empathy (n = 49)

and high-empathy (n = 45) conditions. Empathizing judgments were significantly higher in the high-empathy conditions (M = 4.75, SD = 1.44) than no-empathy conditions (M = 3.71, SD = 1.96), $t(92) = -2.91$, $p = .005$, $d = -.604$, 95% CI [-1.75, -0.33].

5.2.3.2. Empathy & Status Manipulation

The mean and standard deviations of the PoC of all 10 rounds in the four conditions for are shown in Table 12A for empathy (high-empathy, no-empathy) and chance-status (high-status, low-status) conditions. A univariate analysis was conducted with the PoC in the first round as a dependent variable, and empathy and chance-status as fixed-factor variables. There was no Chance-status × Empathy interaction on first round contributions, $F(1, 90) = 0.50$, $p = .82$, $\eta_p^2 = .001$; the main effect of empathy was not statistically significant, $F(1, 90) = 2.04$, $p = .16$, $\eta_p^2 = .022$; and the main effect of chance-status was not statistically significant, $F(1, 90) = 3.47$, $p = .066$, $\eta_p^2 = .037$.

Table 12 A. *The Mean Proportion of Contributions (PoC) in Four Conditions (Chance Status × Empathy);* B. *The Mean Proportion of Contributions (PoC) in Four Conditions (Effort Status × Empathy)*

Chance-status	No-empathy			High-empathy		
	n	*M* (*SD*)	95%CI	*n*	*M* (*SD*)	95%CI
Low-status	26	.565 (.183)	[.494, .635]	20	.548 (.183)	[.467, .628]
High-status	23	.441 (.182)	[.365, .516]	25	.494 (.180)	[.421, .566]

B

Effort-status	No-empathy			High-empathy		
	n	*M* (*SD*)	95%CI	*n*	*M* (*SD*)	95%CI
Low-status	24	.472 (.205)	[.389, .555]	25	.597 (.205)	[.516, .678]
High-status	28	.382 (.206)	[.306, .456]	21	.306 (.206)	[.217, .394]

Focusing on the PoCs across rounds, a 10 × 2 × 2 (Round [1:10]), within-subject variable × (Empathy [high-empathy, no-empathy]) × (Chance-status [high-status, low-status]) between-subject variables repeated-measures ANOVA was conducted. The interaction between chance-status and empathy was not significant, $F(1, 90) = 0.87$, $p = .36$, $\eta_p^2 = .01$ (see Figure 13A); the main effect of empathy was not significant (see Figure 14A), $F(1, 90) = 0.23$, $p = .64$, $\eta_p^2 = .003$; the main effect of chance-status was significant (see Figure 14B), $F(1, 90) = 5.55$, $p = .02$, $\eta_p^2 = .058$; the main effect of round was significant, $F(9, 810) = 5.87$, $p < .0001$, $\eta_p^2 = .06$. Thus, the findings here suggest that overall contributions declined over rounds, as is typically found in PGG studies, and overall contributions were higher in the low-status group compared to the high-status group. All other unreported interactions were non-significant. The Greenhouse-Geisser correction was used in all cases.

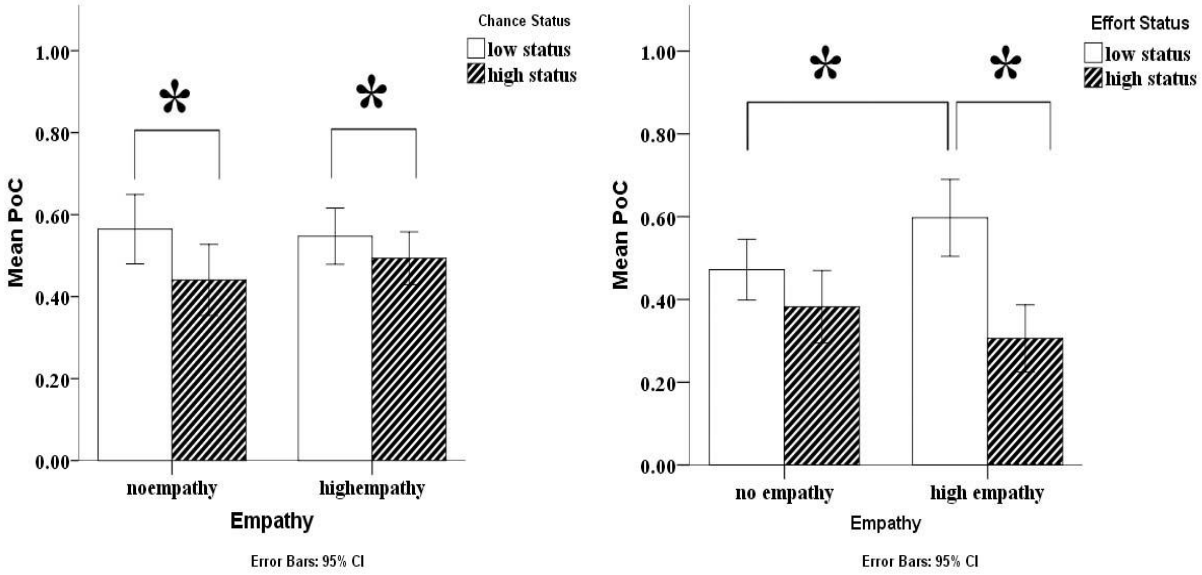

*Figure 13.*A. The mean of proportion of contribution (PoC) across 10 rounds in the chance-status and empathy conditions; *B.* The mean of proportion of contribution (PoC) across 10 rounds in the effort-status and empathy conditions; * denotes $p < .5$.

5.2.3.3. Generalized Tit-for-tat Strategy

The same methods used in Studies 1 and 2 to calculate the use of *generalized tit-for-tat strategy* were used here. A significant correlation between participants' contributions and those of the other players was classified as *generalized tit-for-tat strategy*, and anything non-significant was classified as "*other strategy"*. The results in Table 13 show the number and proportion of people using *generalized tit-for-tat strategy* in each condition. A loglinear analysis revealed that there was no significant difference in the number of participants using *generalized tit-for-tat strategy* for the main effect of empathy, Z = -.019, p = .985, 95% CI [-.727, .714].

5.2.3.4. Regression between PGG and Empathic Disposition

The analyses also explored whether dispositional empathy ability (PT, EC, PD and FT) predicted first round contributions in the PGG. The scores of the four IRI sub-scales and overall IRI mean score were entered into a regression analysis along with first round contribution, and age. Analyses of data from Experiment 3A (see

details Table 14A) failed to show that dispositional empathy ability predicted contributions.

Table 13 *The Number and Proportion Using Generalized Tit-for-tat Strategy in All Conditions Across the Two Experiments*

Conditions	*Generalized tit-for-tat* strategy
Low-status (chance-status) no-empathy	5/26 (19.23%)
High-status (chance-status) no-empathy	5/23 (21.73%)
Low-status (chance-status) high-empathy	4/20 (20%)
High-status (chance-status) high-empathy	8/25 (32%)
Low-status (effort-status) no-empathy	5/24 (21.73%)
High-status (effort-status) no-empathy	5/28 (17.85 %)
Low-status (effort-status) high-empathy	5/25 (25%)
High-status (effort-status) high-empathy	4/21 (19.05%)

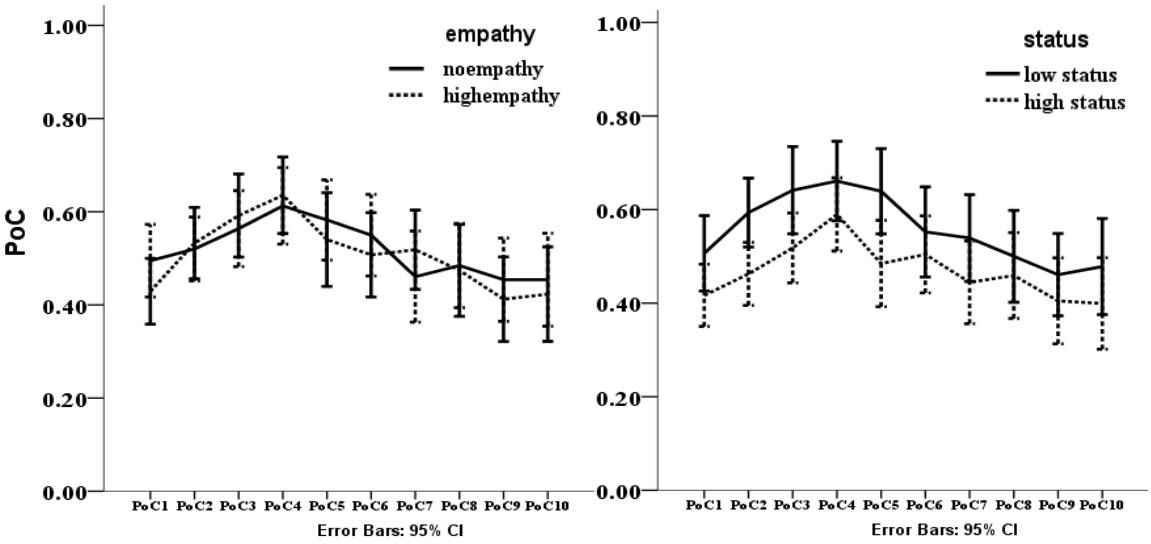

Figure 14. A. Main effect of empathy on the proportion of contribution (PoC); B. Main effect of chance status on the proportion of contribution (PoC)

Table 14 A. *Summary of Hierarchical Regression Analysis for Variables Predicting Contribution in First Round of PGG (N=94) (Chance Status × Empathy); B. Summary of Hierarchical Regression Analysis for Variables Predicting Contribution in First Round of PGG (N=98) (Effort Status × Empathy)*

Variables	B	SEB	β	95% CI
Step 1				
Age	.003	.009	.035	[-.014, .020]
Step 2				
Age	.003	.009	.040	[-.014, .021]
PT	-.043	.039	.028	[-.121, .036]
PD	-.032	.040	-1.20	[-.112, .048]
FS	.003	.034	.010	[-.065, .071]
EC	-.024	.056	-.049	[-.136, .087]

Note. R^2 = .035 for step 1; ΔR^2 = .019 for step 2. ** p< .05; 2 missing data*

Table 14B

Variables	B	SEB	β	95% CI
Step 1				
Age	-.001	.007	-.009	[-.014, .013]
Step 2				
Age	.005	.007	.077	[-.008, .018]
PT	.083	.046	.205	[-.008, .173]
PD	-.045	.043	-.114	[-.130, .039]
FS	-.015	.038	-.041	[-.090, .061]
EC	.113	.062	.217	[-.010, .236]

Note. R^2 = .009 for step 1; ΔR^2 = .107 for step 2. ** p< .05;*

5.2.3.5. Deception Check

Participants' data was further analysed, based on their answer to the debriefing question on whether they believed they were playing the PGG against three other "real" participants. A Round (1-10) × Deception success (yes 1, no 2) repeated-measures ANOVA was conducted (45 missing data). The results found that the interaction between round and deception success was not significant, $F(6.95, 326.59) = 0.915$, $p = .494$, $\eta_p^2 = .019$; and the main effect of deception on contributions in the PGG was also not significant, $F(1, 47) = 0.16$, $p = .691$, $\eta_p^2 = .003$.

5.2.4. Discussion (Experiment 3A)

The key significant finding in Experiment 3A supported Hypothesis 1 regarding status. The findings revealed that the low-status group behaved more pro-socially than those in the high-status groups. In addition to status both the empathy manipulation and measure of dispositional empathy (e.g. IRI) used in Studies 1 and 2, were used to assess a commonly documented association between empathy and cooperation. In contrast to previous studies (Batson & Moran, 1999; Rumble, et al., 2010), the findings from Experiment 3A, consistent with Studies 1 and 2, failed to show an effect of empathy on measures of cooperation, or an association between dispositional empathy and cooperation. Exploratory analyses examined if there was an association between levels of empathy and the likelihood of using a *generalized tit-for-tat strategy*. Here too there was no impact of empathy on this behavioural measure. In Experiment 3A status was determined by chance in order to mimic situations of wealth determined by lotteries. However, in real life settings status can also be determined by effort. Therefore, Experiment 3B was devised with two purposes in mind. First, to examine the extent to which the same pattern of results

would be found under a different system of status acquisition, and secondly to further examine the reliability of the association between empathy and cooperation.

Experiment 3B

Experiment 3B was designed to examine the role of empathy on cooperation when status was determined by effort (effort-status), and to replicate the basic pattern of results found in Experiment 3A. In all respects but one, namely the way in which status was achieved, the design and procedure of Experiment 3B was identical to Experiment 3A.

5.2.5. Method (Experiment 3B)

5.2.5.1. Participants

Ninety-eight volunteers (71 female and 27 male) were recruited from Queen Mary University of London via emails and fliers. The mean age of the participants was 21.10 years (range from 17 to 44; *SD* = 4.06). The payments for participating were the same as Experiment 3B.

5.2.5.2. Design and Materials

Experiment 3B was a 2 × 2 (Empathy [high-empathy, no-empathy] × Effort-status [high-status, low-status] between-subjects experimental design. The critical dependent variable was participants' PoC in the 10 rounds of the PGG. The digit cancellation test is a 23 × 40 matrix which was generated by Matlab software (http://uk.mathworks.com/products/matlab/). In this there are 106 number threes displayed in the matrix. The participants were presented with this matrix on a printed A4 piece of paper and required to cross out the number three as many times as possible within two minutes. The cut-off point of 94 was obtained in a pilot test. Prior to the pilot, the number was set at 84 because this was the median of the group

(*n* = 55, *Mdn* = 84.00, *M* = 80.17, *SD* = 1.58) conducting the experiment. However, when the experiment was initially conducted, most participants (10 out of 12) achieved scores above the 84 threshold. Considering this, the threshold was increased to 94, based on the mean achieved by the piloted high-status group (*n* =10, *Mdn* = 95.5, *M*= 93.60, *SD* = 5.13). Those achieving a score equal to or above 94 were allocated to the high-status condition, and those scoring less than 94 were allocated to the low-status condition. All participants were informed of the allocation procedure prior to performing the test.

5.2.5.3. Procedure

In Experiment 3B, the participants were required to perform a digit cancellation test instead of picking a colour ball in a black box to allocate them into high-status or low-status conditions. Apart from the allocation of participants to high-status or low-status conditions, which was determined by their performance on the cancellation test, all other experimental procedures were exactly the same as the Experiment 3B.

5.2.6. Results (Experiment 3B)

5.2.6.1. Empathizing Manipulation Effectiveness Check

To begin, the aim of this analysis was to establish whether empathy judgments for Experiment 3B differed between the no-empathy (*n* = 52) and high-empathy (*n* = 46) conditions. Empathy judgments were significantly higher in the high-empathy condition (*M* = 6.20, *SD* = 1.73) compared to the no-empathy conditions (*M* = 3.97, *SD* = 1.67), $t(96) = -6.483$, $p < .0001$, $d = 1.31$, 95% CI [-2.92, -1.55].

5.2.6.2. Empathy & Status Manipulation

Table 12B presents the means and standard deviations of the PoCs across the 10 rounds in each of the four conditions: empathy (high-empathy, no-empathy) and effort-status (high-status, low-status). The same analyses were conducted as for Experiment 3A. Here, the interaction between effort-status and empathy was statistically significant for first round contributions, $F(1, 94) = 21.11$, $p < .0001$, $\eta_p^2 = .183$; the main effect of empathy was not significant, $F(1, 94) = 0.90$, $p = .34$, $\eta_p^2 = .01$; but the main effect of effort-status was significant, $F(1, 94) = 15.14$, $p < .001$, $\eta_p^2 = .139$. A 10 × 2 × 2 (Round [1:10]), within-subject variable × (Empathy [high-empathy, no-empathy]) × (Effort-status [high-status, low-status]) between-subject repeated-measures ANOVA was conducted. While the interaction between effort-status and empathy was significant, $F(1, 94) = 5.90$, $p = .017$, $\eta_p^2 = .059$; the main effect of empathy was not significant (see Figure 15A), $F(1, 94) = 0.34$, $p = .56$, $\eta_p^2 = .004$; the main effect of effort-status was significant (see Figure 15B), $F(1, 94) = 21.11$, $p < .0001$, $\eta_p^2 = .183$. Because the interaction was significant, post-hoc pairwise comparisons were conducted, which found that in the high-empathy condition, the low-status condition contributed significantly more than those in the high-status condition, $F(1,94) = 23.23$, $p < .0001$, $\eta_p^2 = .198$, 95% CI [.171, .412] but in the no-empathy condition, there was no significant difference on the contribution rate between low-status condition and high-status condition, $F(1,94) = 2.498$, $p = .117$, $\eta_p^2 = .026$, 95% CI [-.023, .203]. Moreover, the interaction between round and effort-status was significant, $F(9, 846) = 2.52$, $p = .017$, $\eta_p^2 = .026$; the main effect of round was that, in general, contributions decreased over round, $F(9, 846) = 4.15$, $p < .0001$, $\eta_p^2 = .042$; All other unreported interactions were non-significant.

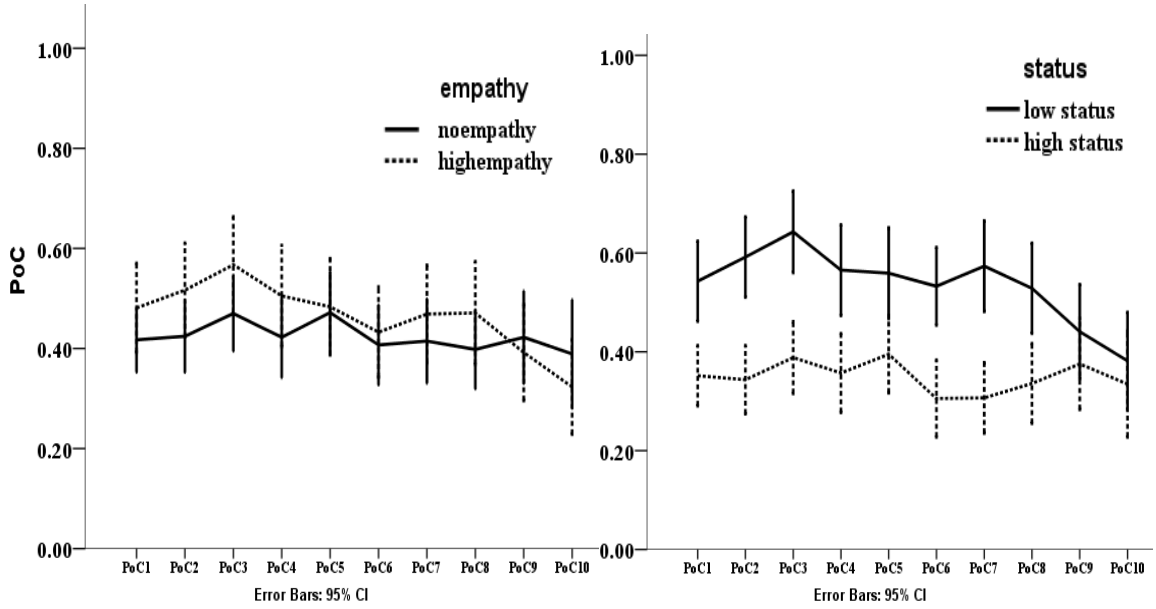

Figure 15. A. Main effect of empathy on the proportion of contribution (PoC); B. Main effect of effort status on the proportion of contribution (PoC)

5.2.6.3. Generalized Tit-for-tat Strategy

The number and proportion of people using *generalized tit-for-tat strategy* in each condition are shown in Table 13. A loglinear analysis revealed that there was no significant difference in the number of participants using *generalized tit-for-tat strategy* suggesting that empathy did not affect the proportion of *generalized tit-for-tat strategy* use, Z = .035, p = .972, 95% CI [-.721, .745].

5.2.6.4. Regression between PGG and Empathic Disposition

Dispositional empathy ability (PT, EC, PD and FS) was used as a basis for predicting first round contributions in the PGG. The scores of the four IRI sub-scales and overall IRI mean score were entered into a regression analysis along with first round contribution, and age. Table 14B shows that none of subscales (PT, PD, FS, EC) of dispositional empathy ability predicted the first round of contributions in the PGG.

5.2.6.5. Deception Check

Like Experiment 3A, Participants data were further analysed according to their answer to the debriefing question on interactive deception: either Yes, they believed that the experimental set-up was as described (i.e. that they were playing with 3 other real participants), or No they did not believe the experimental set-up, and were unconvinced that they were interacting with 3 other participants in the PGG. A Round (1-10) x Deception success (yes 1, no 2) repeated-measures ANOVA was conducted (5 reported unsure; 8 missing data). The results found that the interaction between round and deception success was not significant, $F(6.27, 519.99) = 0.314$, $p = .935$, $\eta_p^2 = .004$; and the main effect of deception on contributions in the PGG was not significant, $F(1, 83) = 0.28$, $p = .598$, $\eta_p^2 = .003$.

5.2.7. Discussion (Experiment 3B)

Consistent with the results from Experiment 3A and Hypothesis 1, the low-status group showed more cooperation than those in the high-status group. While not predicted, Experiment 3B revealed that for those in the low-status group high-empathy condition there was evidence that they showed greater levels of cooperation than those in the low-status no-empathy group. This suggests a highly localized effect of empathy on cooperation. In all other respects empathy did not impact on cooperation. Consistent with the null effects reported in Experiment 3A, in Experiment 3B, there was no reliable evidence that dispositional empathy was associated with levels of cooperation, and also no evidence that levels of empathy were associated with strategic behaviour in the PGG, in particular the *generalized tit-for-tat strategy*.

5.3. Summary and Conclusion of Study 3

Overall, the central concern for this study was to explore the extent to which empathy could increase cooperation in situations where there were differences in status (high vs. low), and differences in the way in which status had been achieved (chance vs. effort). To this end, the effects of inducing empathy on cooperation were generally weak, and restricted to the low-status groups. More specifically, only in the earned status condition (Study 3B), empathy promotes cooperation for those low status groups. In addition, exploratory analysis suggests that dispositional empathy does not predict cooperative behaviour, and that there is no link between empathy induction and the reduction of *generalized tit-for-tat strategies* in the PGG (Axelrod & Hamilton, 1981). Taken together the findings are generally inconsistent with the positive empathy-cooperation link that has been explored using the prisoner's dilemma (Batson, 1991; Batson & Moran, 1999; T. R. Cohen & Insko, 2008; Van Lange, 2008), and also inconsistent with the empathy-altruism assumption (Batson, 2011) in which feeling sad or sorry for another person enhances altruistic motivation, and ultimately leads to increased cooperative behaviour.

To begin, the results showed that low-status groups contributed more PoC than those high-status groups regardless of chance or effort. This is consistent with work showing that high-status individuals (either high income or highly socially privileged) are less pro-social than low-status individuals (Galinsky, et al., 2008). Why is it that the relative status of endowments within a group affects people's cooperative levels when it comes to the public good? In the present study it may be the case that low-status groups behaved pro-socially to improve their standing in a social hierarchy (Willer, 2009b) and thus encouraged pro-sociality as a means of obtaining group identity (Kraus, Piff, & Keltner, 2009). In addition, the association

between low-status groups and greater charitable and helping behaviours (Cote, 2011; Cote, House, & Willer, 2015; Piff, et al., 2010) suggests that this group hold greater feelings of compassion and may be more sensitive to the concept of fairness; this may also help to account for why the effect of empathy on cooperation was localized to low-status groups.

While in general, and consistent with evidence from Studies 1 and 2, empathy does not appear to have a strong effect on cooperation, in Study 3B empathy increased cooperation for the low-status group when the status was determined by effort. One reason for this may be that this group show greater compassion and are more sensitive to fairness (Kraus, et al., 2009), but this does not explain why empathy only impacted those in the lower effort-status and not those in the lower chance-status group. One possible explanation is based on the differences in control that people experienced (Osman, 2014). When the mechanism by which resources are allocated is via *chance*, then clearly there is no sense of control or real ownership that people can feel with regards to having more or less than others (unless one experiences an illusion of control). In contrast, when resources are achieved through *effort*, then people are likely to feel greater ownership and responsibility over the resources they acquired, and that the manner by which they acquired them was under their control. Some have argued that limited control over the attainment of resources leaves low-status individuals, compared to high-status individuals, more dependent on others (Kraus, et al., 2009), which in turn encourages more pro-social behaviour. If an experienced lack of control amplifies pro-sociality due to a dependence on others showing pro-social behaviours, then it is expected that those in the low-status group would show greater pro-social behaviours than the high-status group in the chance-status condition. This is also indicated by the findings of Study 3. What is hard to

determine is whether differences in behaviour resulting from acquiring status through effort or chance is a matter of degree (i.e. levels of control), or a matter of kind (i.e. control vs. no control).

Overall in Experiments 3A and Experiment 3B, those that earned their status contributed less to public goods than those that achieved their status by chance, which is consistent with previous studies that found a "house money effect" (Clark, 2002; Dannenberg, Riechmann, Sturm, & Vogt, 2012; Reinstein & Riener, 2009). This is a situation in which "people may spend or invest windfall money more recklessly than they would their own, even with wealth effects taken into account" (Clark, 2002, p. 223). Also, when tokens were gained through effort, this tends to generate more self-interested behaviour (Cherry & Shogren, 2008). By looking more closely it is possible to track evidence of this behaviour in the present study. Table 12 shows that, for the low-status group, in the no-empathy condition under effort-status, the PoC was lower (.472) compared to in the high-empathy condition under effort-status (.597) and both high-empathy (.548) and no-empathy conditions (.565) under chance-status. While empathy may not have promoted cooperation, these results suggest that it may have prevented a decline in cooperation in the effort-status, whereas in the chance-status it did not because of the "house money effect". Also, for both high-status groups, the PoC of both no-empathy and high-empathy conditions obviously less in effort-status (.382 & .306) than those in chance-status (.441 & .494), which also implies evidence of the "house money effect". In short, the "house money effect" led to a decrease in cooperation for both high-status and low-status groups; however, empathy helped low-status groups maintain levels of cooperation over rounds.

Regarding the limited role of empathy in Study 3, as well as Studies 1 and 2, it may be the case that the use of real financial incentives weakens any impact that

empathy is likely to have in promoting cooperation. When developing the paradigm used in this project, it was important to take heed of critical comments from the economics literature regarding incentives schedules that are in line with the aims of the specific task or game (Hertwig & Ortmann, 2001). What is common to many previous studies discussed in this thesis that have found empathy-induced cooperation, is that their payment system is either in a fixed show-up fee set-up (Xu, et al., 2012) or course credits for participation in the experiment (Batson, Batson, et al., 1995; Batson & Moran, 1999; Rumble, et al., 2010). In contrast, in Studies 1, 2 and 3 participants' payments were directly associated with their choice-behaviour, ranging between £7.46 and £17.41. Even though empathy-induced altruism may appear to promote cooperation (Batson & Moran, 1999), it may only be the case for studies in which participants are not playing for real money. When they do, the cost of cooperative behaviour is so high that empathy is not strong enough to override a self-maximizing strategy (Ma-Kellams & Blascovich, 2013). Therefore monetary incentives may mute the effect of empathy because they alter what participants regard as salient motivators of behaviour.

What appears to be clear is that while people start off with good intentions in the first few rounds of the PGG, as they approach the end of the game greater selfish behaviours emerge, consistent with many previous studies using a linear iterated PGG (Fehr & Gächter, 2002). More to the point, it may be the case that in social exchanges people opt for a typical tried and tested simple strategy, such as *tit-for-tat* (Axelrod, 1984; Axelrod & Hamilton, 1981; Nowak & Sigmund, 1993), which limits the extent to which inferences regarding others' complex intentions are needed. Generally *tit-for-tat* was the most popular strategy employed across all three experiments (approximately 40% on average). Because *generalized tit-for-tat* is so robust, and so

commonly employed, this too might contribute to muting the effects of empathy on cooperation. The insight that Study 3 has revealed also points to a need to examine ways of countermanding the potential muting effects of monetary incentives and simple behavioural strategies. It may be that promoting cooperation requires the induction of empathy and trust (De Cremer, et al., 2001), as well as increasing communication (Bixenstine & Douglas, 1967; Yamagishi & Yamagishi, 1994) and the range of strategies used (Axelrod, 1984; C. D. Parks, et al., 2013).

5.4. Conclusion

In summary, status and the way in which it is achieved (earned, inherited) appears to be a more salient factor in determining the level of cooperation observed in a multiplayer game than empathy. The findings from Study 3, taken together with the findings from Studies 1 and 2 bring into question the extent to which empathy can effectively promote cooperation when other critical factors are considered. In addition, Study 3 raises the questions of what the meaning of fairness is, and what role empathy can have when there is inequality of resources. Fairness helps people to manage uncertain situations by giving them "confidence that they will ultimately receive good outcomes and because it makes the possibility of loss less anxiety-provoking" (Lind & van den Bos, 2002, pp. 195-196). Empathy may trigger more concerns and reactions towards unfairness, which in turn may motivate behaviours in order to reduce inequality (i.e. inequality aversion). Up until now, empirical work has been focused on supporting this under situations of equality of outcome (Brosnan & de Waal, 2014; Choshen-Hillel & Yaniv, 2011; Dannenberg, et al., 2012). Study 3 was unable to find evidence, using the unexplored inequality of resources condition, to support the general intuition of the impact of empathy on cooperation, although recent research studies indicate that high initial levels of economic inequality alone

have relatively few deleterious welfare effects (Nishi, Shirado, Rand, & Christakis, 2015). Up until now the method that has been used to explore the empathy-cooperation link has been the online paradigm in which participants interact with three other fictitious players. The motivations for using this method were to carefully control the different factors that are thought to influence cooperation, specifically empathy. However, given that across three studies, there has been a consistent failure in finding a robust empathy-cooperation link, Study 4 was designed to replicate Study 3, but using a dyad in which participants were interacting with real players, as well as with real incentives, which has been a consistent method of motivating participants to take part in Studies 1-3.

Chapter 6 Study 4: The Empathy Effect on Cooperation in Two-player PGG

Summary of Chapter 6: Chapters 3, 4 and 5 used similar experimental paradigms to explore the role of empathy on cooperation when empathy itself, or empathy with personal values and status were manipulated. All three studies demonstrated that empathy induction had a weak effect on promoting cooperation, inconsistent with previous studies (Batson & Ahmad, 2001) that have used the same empathy induction method.

There are two possible reasons for the differences in results between the present project and previous studies. Firstly, Studies 1-3 involved "interactive deception". It is still unclear as to whether the introduction of "interactive deception" affects the empathy-cooperation link, but it is possible that this type of paradigm weakens the effect because participants have doubts as to whether they are interacting with others. Second, there may be an issue in the group size (n = 4) in the public goods game (PGG). As mentioned throughout the empirical chapters, what is notable in previous successful demonstrations of the empathy-cooperation link in social dilemma games is that a single target is identified and empathy can be directed towards them, which in turn converts to greater levels of cooperation. Therefore, as discussed, the weak effect observed in Studies 1-3 of empathy on cooperation may potentially be the result of diffusing the target of empathizing. In response, Study 4 was designed to overcome both these potential limiting factors. Study 4 used a two-player version of the PGG in which both players were real. The research hypotheses for Study 4 are as follows. Hypothesis 1: The role of empathy induction on the contributions in the 2-player PGG will be significant, specifically that in the high-

empathy conditions both players will contribute a larger proportion into the common pot; Hypothesis 2: Heterogeneity will increase the overall contribution rate in the PGG; Hypothesis 3: Based on the research findings in Study 3, low status people (Player A) will contribute proportionally more than high status people (Player B) in the [10, 20] conditions; Hypothesis 4: Empathy induction will reduce players use of *generalized tit-for-tat* strategy.

The main focus of Study 4 was to replicate the basic status effect reported in Study 3, but using a 2-player version of the PGG. One hundred and sixty volunteers were recruited and randomly assigned into one of the four conditions (high-empathy heterogeneous endowments [Player A = 10 tokens; Player B = 20 tokens], no-empathy heterogeneous endowments [Player A = 10 tokens; Player B = 20 tokens], high-empathy homogenous endowments [Player A = 20 tokens; Player B = 20 tokens], no-empathy homogenous endowments [Player A = 20 tokens; Player B = 20 tokens]), and different roles (Player A or Player B). Overall, despite attempts to give empathy the best chance of influencing cooperation, Study 4 results found that for both Player A and Player B, the empathy induction technique did not lead to significant increases in cooperation in the PGG.

6.1. Introduction

As discussed throughout, previous studies have reported a positive effect of empathy on cooperation levels in both the prisoner's dilemma (Rumble, et al., 2010) and ultimate game (Stephan & Finlay, 1999), which are paradigms for investigating dyadic interaction. However, in the three studies of this project thus far, the effect of empathy induction on cooperative behaviour in the four-player PGG has been relatively restricted, irrespective of whether empathy was induced in a pure set-up (Study 1), or with additional manipulations regarding value cues (Study 2) or status

(Study 3). To rule out potential confounding variables which may lead to null effects, a 2-player variant of the PGG was designed (Spraggon & Oxoby, 2009). As there are only two players involved in this 2-player PGG, the manipulation of empathy is clear, with no ambiguity in identifying the relevant target of empathy. Moreover, the two real participants meet face-to-face in the laboratory prior to entering the separate cubicles to reinforce the fact that each player is playing with a real player, or target of their empathetic experiences. Study 4 examines four hypotheses.

Hypothesis 1: It was predicted that the role of empathy on the contributions made in the PGG will be significant in that in the high-empathy conditions both players will contribute more to the group pot than those in the no-empathy conditions. As speculated, it may be that one-to-one interactions help people to personalize one another and to see each other as unique individuals rather than relying on categorical identities as the basis for classifying each other (Brewer & Miller, 1984). In addition, studies that have found a positive empathy-cooperation link used paradigms such as prisoner's dilemma and ultimate game, in which there is a dyadic interaction rather than multiple group members' intragroup interaction. Moreover, based on the reviewed literature in this thesis, no other studies have examined status using a 2-player PGG set up, and so this should provide new insights into the potential role of empathy in a specialized social set-up.

Hypothesis 2: According to previous studies (e.g., Fung & Au, 2014), heterogeneity leads to an increase in cooperation overall. Therefore, in groups in which there were heterogeneous endowment groups [10, 20], the cooperative rate will be higher than in the homogeneous endowment groups [20, 20].

Hypothesis 3: Regardless of the presence or absence of the empathy induction, Player A in the [10, 20] conditions (low-status groups) will devote a higher proportion

of contribution (PoC) than Player B in the [10, 20] conditions (high-status groups), at least in the first round of the PGG. Study 3 consistently revealed in both experiments that low-status groups behaved more cooperatively than high-status groups. Therefore, given the similarity between the experimental set up in Study 3 and Study 4, it is predicted that the equivalent low status individuals (i.e. those endowed with less than their game partner) will contribute more in the PGG.

Hypothesis 4: The empathy induction will modulate the use of the *generalized tit-for-tat* strategy in both players. According to the evolutionary theoretical explanations discussed in section 2.2 Theories about Human Cooperation, the strategy for strangers who interact repeatedly is direct reciprocity with *Tit-for-tat* strategy based on direct reciprocity (Axelrod & Hamilton, 1981). The last hypothesis for Study 4 is to explore whether the empathy induction will be more likely to reduce the tendency for using *generalized tit-for-tat* strategy, as was assessed in studies 1, 2, and 3.

6.2. Method

6.2.1. Participants

The study recruited 160 volunteers (87 female and 73 male) from Queen Mary University of London via emails and fliers. The mean age of the participants was 22.86 years (range from 18 to 50; *SD* = 4.97). Prior to starting the study participants gave informed written consent and were allocated to one of four conditions – i.e. 40 in each condition (20 dyads). Remuneration for participation was based on the tokens gained in the PGG at a rate of 25 tokens equals £1. Depending on the condition they were assigned to, they were given different payments. In the high-empathy heterogeneous condition (he10:20) and no-empathy heterogeneous condition

(ne10:20) participants were paid between £4 to £9.6 for Player A and £8-9 for Player B. In the high-empathy homogenous condition (he20:20) and in the no-empathy homogenous condition (ne20:20) participants were paid from £5 to £13. The Ethics Committee of Queen Mary University of London approved the study (QMREC1190).

6.2.2. Design and Materials

Study 4 was a 2 × 2 (Empathy [no-empathy, high-empathy] × Condition ([10, 20], [20, 20]) between-subjects experimental design. The four conditions were referred to as he10:20, he20:20, ne10:20, ne20:20. The critical dependent variable was the proportion of participants' contributions (PoC) in each of the 10 rounds of the PGG. A prior power analysis was conducted using G*power (http://www.gpower.hhu.de/en.html) to infer the required sample sizes for this study (Faul, et al., 2007). Assuming the effect size of empathy is the medium effect (f = 0.25) suggested by Cohen, defined for between-subjects repeated-measures ANOVA (J. Cohen, 1988), the required total sample size is 72 pairs, when the power ($1-\beta = .8$), and actual power equals .805.

The experimental cubicle included a computer with two monitors. A folding screen was placed between the two computer monitors to separate the participants. The PGG was programmed and conducted via a computer using E-prime 2.0 software. In the high-empathy conditions, the same empathy induction instructions were provided as those used in Studies 1-3. In the no-empathy conditions, no perspective-taking instructions were provided.

In [10,20] conditions (he10:20 and ne10:20), Player A was assigned 10 tokens in each round, whereas Player B was assigned 20 tokens in each round; in [20, 20] conditions (he20:20 and ne20:20), both Player A and Player B were assigned 20 tokens for each round.

A paper-based pre-task mathematic calculation test consisted of four questions. Each question is used to assess one extreme situation that might happen in in the PGG (20,20) (0,0) (0,20) (20,0), as a way to assess the extent to which participants understand the different outcomes in the rounds. A calculator was also prepared for participants. This pre-task mathematic calculation test is often used in prisoner dilemma games to assess instruction comprehension.

A paper-based post-task questionnaire was also presented at the end of the study and used as a manipulation check to assess the effectiveness of the empathy induction manipulation, just as in Studies 1-3. In addition, as with Studies 1-3, Study 4 included post-task questions that recorded participants' impression towards the other players on a 9-point scale, ranging from 1 (*not at all*) to 9 (*very much*). This was based on the extent to which they feel compassion or pity towards the partner.

6.2.3. Procedure

Two participants were tested together in a soundproofed experimental cubicle. They were seated facing a computer monitor and separated using a folding screen, as shown in Figure 16. After reading the information sheet and signing the consent form, one of the two players was asked to pick a ball from a black box without looking. If they picked the red ball, the participant was assigned as Player A; if they picked the blue ball, they were assigned as Player B. They were then allowed to enter the experimental cubicle. In front of each computer monitor, there were labels indicating their corresponding roles (i.e. Player A, Player B).

Figure 16. Laboratory setting for 2-player PGG in Study 4

Once seated and allocated to their role, participants were required to answer a pre-task question in pencil and paper. For high empathy conditions the question was "Describe an event that has happened to you that has made you sad in the last year".. In the no-empathy conditions, the pre-task question was "Describe a type of sport that you enjoy". Player A and Player B were not allowed to communicate with each other during this part of the experiment.

After 2 minutes the responses to the pre-task question were handed in to the experimenter who placed them in an envelope. Whilst this was happening the two players could communicate with each other.

After this, a pre-task mathematic calculation test was presented which took up to 5 minutes to complete. The experimenter returned after 5 minutes and provided the correct maths test answer to the participants allowing the participant a minute to check the answer for themselves.

Next, they were given the relevant instructions, token form and PGG money allocation, based on the assigned condition. After the instructions were explained to the participants, a practice round of the PGG was initiated.

In the high-empathy condition, the PGG program was presented with the empathy induction procedure. Participants were instructed: “Please open the envelope and read the note about your partner. While you are reading this, try to imagine how the person felt about what he/she has just described. Try to imagine how it has affected him/her and how he/she feels as a result”. In the no-empathy condition, participants were instructed: “Please open the envelope and read the note about your partner.”

The experimenter then gave the participant the envelope containing the other players’ response note and a rating sheet. However, unbeknownst to the participants, the experimenter had surreptitiously switched the envelopes containing the participants written replies for ones with pre-prepared responses. This was done make sure that all participants received the same details, and so the effects of empathy could be carefully controlled. The pre-prepared notes for each condition were as follows. In the high-empathy conditions (he1020; he2020), the note concerned details regarding a break up with their long-term partner;

Break up story: “Well, I don’t know if this will be interesting to anybody else, but the only thing I can think of is that two weeks ago my boyfriend and I broke up. We’ve been together since year 12 in school and had kept the relationship up since Uni. It has been great going out while we have been together at QMUL as well. I thought he felt the same, but things have changed. Now he wants to date other people. This has got me down and been on my mind, been a bit hard to cope.”

In the no-empathy conditions (ne1020, ne2020), the note concerned a neutral story regarding swimming;

Swimming story: "Well, I enjoy swimming. I go swimming about a couple of times a week. I always go to my local swimming pool, which is about 10-minutes' walk from my house. I usually swim about 1000 meters each time I go. It takes me about a half hour to complete the swimming session and then I spend about a half hour using the sauna and steam room and then have a shower afterwards. I usually do this after work before going home for dinner."

Participants read the pre-prepared stories and were asked to rate them on the rating sheet prior to starting the PGG. For each round of the PGG, participants were first presented with the round number and the number of tokens they were endowed with. They were then required to decide on how many of their tokens to contribute to the pot. Player A (0 to 10 for he1020 and ne1020, and 0 to 20 tokens he2020 and ne2020) made the decision first followed by Player B (0 to 20 for all conditions),with this method continuing throughout the duration of the game. Both players did not know the other players' decision until post-round feedback was presented. After the participants entered their choice, and were required to wait between 4 and 12 seconds, randomly determined by the program. They were then given feedback, "Player A: your contribution this round; your final tokens this round; your cumulative tokens; Player B: your contribution this round; your final tokens this round; your cumulative tokens:" The program then moved to the next round. This procedure was repeated until all 10 rounds were complete. Participants were required to copy down all the values presented in each round using the pencil and form provided. The reason for this was to make sure that participants attended to all the feedback information presented on the screen on each round.

On completion of the PGG, participants were required to answer some questions in the debriefing session in terms of the strategy they used, and their understanding of the optimal decision. Finally they were debriefed on the details about the study and its purpose.

6.3. Results

The first set of analyses discussed concerns the empathizing manipulation check, then the effect of empathy on cooperative behaviours in PGG is examined, and this is followed by the analysis of the percentage of those using the *generalized tit-for-tat strategy* in each condition for both players.

6.3.1. Empathizing Manipulation Check

An independent-samples *t*-test was conducted on judgments regarding the extent to which participants empathized with the experiences of the other player in the no-empathy (n = 80, M = 4.75, SD = 2.53) and high-empathy (n = 80, M = 7.40, SD = 1.57) conditions. Empathizing judgments were significantly higher in the high-empathy condition (breakup story) than no-empathy condition (swimming story), $t(158) = 7.94$, $p < .0001$, d = -1.25, 95%CI [-3.31, -1.99]. This confirms that the empathy induction method was successful in promoting empathic concern towards the target.

6.3.2. Empathy and Condition Manipulation

The mean and standard deviation PoC (over 10 rounds), in each of the four conditions for both players are shown in Table 15.

Table 15 *The Mean Proportion of Contribution (PoC) in Four Conditions*

Condition	No-empathy			High-empathy		
	n	*M* (*SD*)	95%CI	*n*	*M* (*SD*)	95%CI
[10,20] Player A	20	.539 (.290)	[.410, .668]	20	.704 (.290)	[.574, .833]
[20,20] Player A	20	.513 (.290)	[.384, .643]	20	.567 (.290)	[.437, .696]
[10,20] Player B	20	.585 (.304)	[.450, .721]	20	.622 (.304)	[.486, .758]
[20,20] Player B	20	.523 (.304)	[.387, .758]	20	.555 (.304)	[.419, .691]

Note. CI = confidence interval

For Player A, a Multivariate analysis was conducted for the first round PoC, no interactions or main effects found to be significant. In addition, a 10 × 2 × 2 (Round [1:10]), within-subject variable × (Empathy [high-empathy, no-empathy]) × (Condition [(10, 20); (20, 20)]) between-subject repeated-measures ANOVA was conducted. Again none of the interactions or main effects were significant. The same statistics was conducted for the data for Player B. Following the same pattern as Player A, none of the interaction and main effects were found to be significant. The Greenhouse-Geisser correction was used in all cases.

As shown in Figure 17, there were no statistically significant differences in first round PoC across the four conditions. To compare the first round PoC of Player A and Player B in the [10, 20] condition, a Univariate analysis was conducted and did not reveal a significant main effect of empathy, $F(1, 76) = .015$, $p = .903$, $\eta_p^2 < .0001$. There was also no significant main effect of player, $F(1, 76) = 1.282$, $p = .261$, $\eta_p^2 = .017$, and no significant interactions, $F(1, 76) = .094$, $p = .760$, $\eta_p^2 = .001$. Thus, there was no significant difference between both players in the contributions they made in the first round, regardless of the empathy induction manipulation.

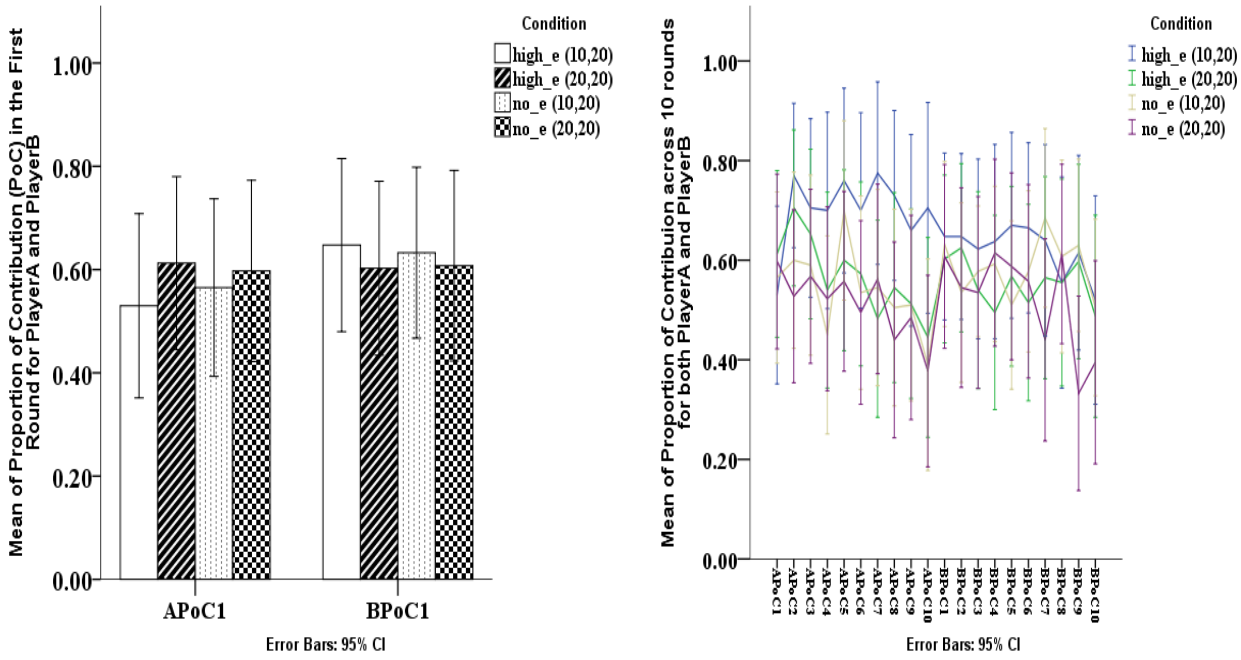

Figure 17. A The mean of proportion of contribution (PoC) in first round for Player A and Player B (80 pairs, N = 160) in four conditions; B The mean of proportion of contribution (PoC) for both players in four conditions; Error bars represent ± 95% CI.

6.3.3. Generalized Tit-for-tat Strategy

Table 16 shows that Player A's contribution positively correlated with that of Player B's in each sequential round starting at the 3rd round, and likewise, Player B's contribution was positively correlated with Player A's contribution in the subsequent rounds. This data indicates that, in general, both players adopted the *generalized tit-for-tat* strategy after the 3rd round of the PGG.

The number and proportion of Player A and Player B using *generalized tit-for-tat* strategy in each condition are shown in Table 17. Chi-square tests were conducted and revealed that there was no statistically significant difference across the four conditions for Player A ($\chi^2(6) = 8.00$, $p = .238$) or for Player B ($\chi^2(9) = 12.00$, $p = .213$), indicating that the empathy induction did not reduce the likelihood of players using *generalized tit-for-tat* strategy as expected.

Table 16 *The Mean Contribution in Earlier Rounds for Player A and the Sequential Rounds for Player B's Correlations Overall*

Player A correlated with Player B in the later round			Player B correlated with Player A in the later round		
	r	*p*		*r*	*p*
Ac1-Bc2	.181	.109	Bc1-Ac2	.096	.397
Ac2-Bc3	.356**	.001	Bc2-Ac3	.427**	<.001
Ac3-Bc4	.481**	<.001	Bc3-Ac4	.548**	<.001
Ac4-Bc5	.584**	<.001	Bc4-Ac5	.467**	<.001
Ac5-Bc6	.500**	<.001	Bc5-Ac6	.555**	<.001
Ac6-Bc7	.512**	<.001	Bc6-Ac7	.656**	<.001
Ac7-Bc8	.632**	<.001	Bc7-Ac8	.596**	<.001
Ac8-Bc9	.414**	<.001	Bc8-Ac9	.582**	<.001
Ac9-Bc10	.467**	<.001	Bc9-Ac10	.430**	<.001

Table 17 *The Number and Proportion Using Generalized Tit-for-tat Strategy in All Conditions for Player A and Player B*

Conditions	Player A (Player A (2-10round) & Player B (1-9round))	Player B (Player B (2-10round) & Player A (1-9round))
He1020	5/20 (25%)	3/20 (15%)
He2020	3/20 (15%)	1/20 (5%)
Ne1020	1/20 (5%)	2/20 (10%)
Ne2020	5/20 (25%)	6/20 (30%)

6.4. Discussion

The findings in Study 4 show that the empathy induction method that has been used in this entire project did not promote cooperation in a 2-player PGG in which both players were real. Therefore, Study 4 did not support the first hypothesis. In terms of empathy induction on cooperative behaviour, the findings are inconsistent with previous research studies, but consistent in general, with the findings of Studies 1, 2 and 3. As empathy-altruism theory claims that empathy triggers altruism towards another I expected cooperation in high-empathy conditions to be higher than in the no-empathy condition. More to the point, this study was specifically designed to encourage this effect by using a 2-player PGG experimental setting. While the rationale behind including the manipulations introduced in Study 4 fit with the general claims regarding how empathy is likely to promote cooperation, the study was still unable to detect this link. One of the key remaining reasons for these mixed findings may be the use of real financial rewards, which may have muted any effects of empathy. While most social dilemma experiments conducted by social psychologists do not tend to use real financial incentives, there seems validity in using them here, as finance incentives appear the most common and direct method of motivating behaviours, particularly in the work place.

Consistent with previous studies, the findings from Study 4 did support Hypothesis 2 in that heterogeneity did indeed result in an increase of overall contribution. This corroborates evidence from some previous studies (Buckley & Croson, 2006; Chan & Mestelman, 1999; Cherry, et al., 2005; Fung & Au, 2014; Kroll, et al., 2007a; Secilmis & Guran, 2012). For example, Cherry (2005) suggested that when groups had heterogeneous endowments in public goods problems, the contribution levels were significantly lower than when groups had homogeneous

endowments. Moreover, Karaivanov (2009) also argued that the endowments heterogeneity has a negative effect on the total provision of public goods, because it leads to non-contribution by some participants who contribute under homogeneity.

With regards to Hypothesis 3 in Study 4, the low-status group was predicted to behave more cooperatively than the high-status group. Therefore, Player A should have contributed a higher proportion of their tokens than Player B in the [10, 20] groups, since only in [10, 20] conditions there was a status manipulation. That both players behaved similarly did not support Hypothesis 3 (nor replicate the findings of Study 3) in which it was predicted that Player A would behave more cooperatively than Player B in the [10, 20] condition. Buckley and Croson (2006) argued that the less wealthy subjects (less endowment participants, Player A here) would give more as a percentage of their income than the more wealthy subjects (more endowment participants, Player B here). Nevertheless, unlike the result of Secilmis (2012), they found that regardless of income levels, participants contribute approximately the same percentage of their income (their endowments) to the dynamic public good. Obviously, the inconsistency of research findings for previous studies is controversial. According to the group engagement framework (Weber, et al., 2004) and inequality aversion model (Fehr & Schmidt, 1999) individuals with higher incomes (high status) give a higher fraction of their income to the public good than individuals with lower income (low status). And the principle of *noblesse oblige* applies. This is generally used to imply that nobility extends beyond mere entitlements and requires the person who holds such status to fulfil social responsibilities. The idea emerged to guarantee that those in the upper echelons of society (higher status) act benevolently toward others who have less (lower status). In contrast, more and more empirical evidence (Piff, et al., 2010) has shown that lower status individuals are more dependent on

others to achieve their desired life outcomes and more likely to act in a pro-social fashion, that is, contribute more to the public goods. In Study 4, both high status and low status groups contributed the same proportion of their endowments, whereas in the Study 3 (both Experiment 3A and Experiment 3B), the lower status groups contributed a higher proportion than the higher status group. The difference raises the question as to the role of status of cooperative behaviour as collective action.

Finally, with regards to the *generalized tit-for-tat* strategy, according to Cohen (2008), *generalized tit-for-tat strategy* teaches participants to realize the long-term cost of defect and as a result, they are more likely to adhere to mutual cooperation. According to evolutionally biologists, reciprocity is the norm when individuals repeatedly interact with the same individual (see section 2.2 Theories about Human Cooperation). Furthermore, as demonstrated by Axelrod (1984), the *generalized tit-for-tat strategy* is the strategy of reciprocity. The overall data analysis for *generalized tit-for-tat* usage for both Player A and Player B, shown in Table 16, revealed that from the third round onwards, both players adopted such a strategy. Whether in fact empathy induction reliably modulates both players' *generalized tit-for-tat* usage is an issue that requires further attention however. Indeed, as shown in Table 17, and inconsistent with the hypothesis, empathy induction did not modulate the likelihood of using such a strategy regardless of players' classification.

6.5. Conclusion

In conclusion, the results of Study 4 fail to show that an empathy induction method, typically employed by several key cited studies, promotes cooperation in a dyadic interaction between two players. Moreover, unlike what was found in Study 3, status was not found to be a salient factor which raises questions regarding the processes involved in decision-making in a 2-player PGG, and to what extent are they

differ to those used in the more conventional 4-player PGG. Finally, it appears that one of the key issues that may explain the lack of an empathy-cooperation association in this project is the presence of financial incentives. When a decision has to be made whether to cooperate or defect in a social dilemma game, these financial incentives may be more salient than empathy.

Chapter 7 General Discussions of the Findings

7.1. Summary of the Findings of this Dissertation

The general research question that this thesis was concerned with was to explore the role of empathy on human cooperative behaviour when there is conflict between individual interest and collective interest. As discussed in section 2.2 Theories about Human Cooperation, unlike evolutionary biologists or economists, social psychologists are much more interested in investigating the situational factors and individual differences that modulate human cooperative behaviour (Van Lange, Balliet, Parks, & Van Vugt, 2013). This thesis explored several situational and dispositional factors regarding the promotion of cooperation from a unique perspective with a focus on how empathy induction and empathy personality traits modulate human cooperation. The aim of this discussion is to consider the implications of the project in regards to research in the social psychological domain, which investigates the empathy-cooperation link.

7.1.1. Situational Empathy

According to the definition of empathy used in this thesis, empathic concern is an other-oriented response to the perceived suffering of others, which consequently produces an incentive to behave pro-socially in order to support or alleviate this suffering. |The manipulation of contextual signals (others' suffering), in order to induce an empathic response to achieve a behavioural change (via increases in cooperative behaviour in a PGG), failed to result in any strong empirical support for the empathy-cooperation link across the 4 studies. No matter whether participants were assigned with equal endowments (Studies 1 and 2), unequal endowments (Studies 3 and 4), or even when the target of empathy was easily identifiable (Study

4), empathy induction treatments failed to produce reliable increases in cooperative behaviour in the PGG. This is in direct contrast to the most widely accepted empirical findings (e.g., Batson, 1999; Rumble et al., 2010) and current theories (empathy-altruism hypothesis or negative-state relief hypothesis) in the social psychology literature.

A highly localized situation in which empathy did impact on cooperative behaviours was revealed in Study 2 however. Personal values are considered as another social motivation for promoting cooperation in collective societal action. Study 2 found that those who believed they were interacting with real players in a cooperative game, acted more cooperatively in the social value condition, compared to the economic value condition, when there was empathy induction (in that case perspective taking instruction).

Another highly specialized situation in which empathy induction was found to have an effective role of modulating cooperation was for those in low status groups when status was determined by effort (Study 3). This finding implies that both status and the origin of status play a relevant role in the empathy-cooperation link in intragroup cooperation. However, in terms of dyadic cooperation in the 2-player PGG (Study 4), status was not found to be effective enough to elicit this target behaviour change. One thing to note here is that in Study 4 status was determined by chance, whereas the empathy-cooperation link found in the low status group in Study 3 was when status was determined by effort. This suggests that while people are sensitive to unequal resource distribution, and empathy induction techniques can amplify this sensitivity, any effect empathy has in directing behavioural change is highly specific, and the basis on which unequal resource distribution is determined clearly matters. Again, this challenges the considerable body of work in the social psychology domain

that suggests that the empathy-cooperation link is robust, and reliable (Batson, et al, 1995).

Why did empathy induction not lead to significant increases in cooperation in the current studies (Studies 1, 2, 3 & 4)? There are some potential reasons for this null effect of empathy-cooperation link.

a) Previous studies (e.g., Batson & Ahmad, 2001; Rumble, et al., 2010) which found reliable positive effects of empathy induction on cooperation adopted the prisoner's dilemma paradigm, categorized as a two-player social dilemma. However, in the series of experiments in this thesis, Studies 1, 2 & 3 used a 4-player PGG. Therefore, I inferred that the reported null effect of empathy induction might be due to the dilution of empathy induction, which is found in larger groups ($n > 2$). Study 4 was designed to account for this but the data failed to support the statement that empathy induction works solely in dyadic cooperation. The 4-player PGG and 2-player PGG can be said to explore intragroup cooperation and dyadic cooperation respectively. To some extent, dyadic cooperation is a special example of intragroup interaction, but investigates one-to-one interaction. What is the critical difference between the intragroup interaction ($N = 4$) and dyadic interaction that leads people to respond differently to others' stories of suffering? Whether group size increases or decreases cooperation is a running debate in the field of cooperation research. Olson stated that contributions usually decreased as group size increased, as they believed that in larger groups, non-cooperative behaviour is difficult to detect and therefore, self-interested people will be less willing to contribute (Ledyard, 1994, p. 45). Those studies suggested the larger group is, the less cooperative it is. However, it does not explain why group size influences the empathy-cooperation link. What is it about the situational cues specific to the intragroup and dyadic interactions that lead to people

acting differently in the two contexts? One study has suggested an explanation based on the "collapse of compassion". This implies that as the number of people in need of help increases, the degree of compassion (empathic response in our case) people feel, ironically, tends to decrease. They accounted for it by suggesting that the needs of large groups can be potentially overwhelming, and, as a result, people engage in emotion regulation to prevent themselves from experiencing overwhelming levels of emotion. When people confront groups, they are more likely to elicit emotional regulation than when they confront individuals; therefore, people feel less compassion (empathy) for groups than for individuals (Cameron & Payne, 2011). This suggests that intragroup interaction is more likely to elicit emotional regulation than dyadic interaction, and could be a possible explanation for the null effects found in Studies 1, 2 & 3 of this thesis. However, Study 4 also found no positive connection between empathy and cooperation for a dyadic interaction, in which people confront an individual and therefore there must be other reasons contributing to the null effect.

b) The second and potentially most important reason is the monetary incentive involved. The critical decision in the PGG is the amount of money to contribute. It is a multi-motivation decision making task. The involvement of financial incentives strengthens one of the multi-motivations – egoism, which leads to not contributing to the public goods. The design of the game is to elicit altruism induced by empathy, however the nature of payoff, i.e. money, is not altruistic? In comparisons to previous studies (e.g., Batson & Moran, 1999), the strengthened egoism here overrides altruism to lead to a more cooperative behaviour. The coexistence of financial incentive-induced egoism and empathy-induced altruism did not necessarily lead to the behaviour change however. Further discussion about the introduction of financial incentive will be presented in 7.3.2 financial incentive.

c) Another potential reason is the gender of participants. Previous studies (Batson & Ahmad, 2001), which found a positive connection between empathy induction and cooperative behaviour in the social dilemma games used female-only participants. In contrast, in the series of experiments in this thesis, both male and females were recruited in the studies. Whether the gender issue lead to the null effect of empathy-cooperation link will be an interesting topic to pursue and investigate more deeply.

In summary, this thesis consistently explored the empathy-cooperation link in four studies in which empathy was artificially induced via instructions, and yet this alone was not able to reliably impact on cooperative behaviours in a social dilemma game. The only contextual factors, in addition to empathy, that lead to changes in cooperative behaviour were for those that had achieved a low status via poor performance in a cognitive task, and players' belief that they were interacting with others who had signalled pro-social values.

7.1.2. Dispositional Empathy (and lack there of)

There is some research to suggest that there is a link between personality traits and pro-social behaviours (Eisenberg, 2002; Peterson & Seligman, 2004) and dispositional empathy significantly predicts an individual's behaviour in social dilemma games (T. R. Cohen, 2010). What is more, there is evidence indicating that the empathic concern subscale measured by IRI correlates with helping behaviour in a variety of situations (see Davis, 1994, for a review), and further evidence suggesting that individuals with narcissistic personality, psychopathy, and autistic spectrum disorder (ASD) – all of which show characteristically a lack of empathy, in turn behave less cooperatively (Colombi et al., 2009; Krueger & Tackett, 2006). For example, Sally and Hill (2006) found that participants with autism were much more

likely to accept low initial offers and refuse fair proposals in the ultimatum game, and were more reluctant to shift between versions of the prisoner's dilemma. In addition, there is work showing that specific psychopathic personality inventory subscales (Machiavellian egocentricity) are negatively associated with cooperation in a one-shot prisoner's dilemma (Curry, Chesters, & Viding, 2011). This evidence clearly suggests that those with empathy deficit personality disorders act less cooperatively in economic games.

Nevertheless, despite this body of work, in Studies 1, 2 and 3 of this project there was no positive correlation between individual differences in empathetic ability (and lack of empathic ability – i.e. narcissism) and cooperative behaviour in the PGG (the first round or the average contribution across 10 rounds). These findings raise the question as to whether researchers can rely on personality traits measured by questionnaires to predict individuals' behaviours, such as cooperation in a social dilemma game. In three studies with approximately 400 participants, there was not sufficient evidence to support a personality-cooperation link, particularly between dispositional empathy and cooperation. It may be the case that this particular method of examining empathic disposition does not load reliably well on cooperative behaviours as measured in a PGG; however, it is not clear why this relationship is found in other social dilemma games. The PGG involves making decisions regarding a continuous measure (i.e. number of tokens), whereas in other social dilemma games, the decisions that are required are dichotomous (i.e. cooperate or defect).

The other individual difference explored in this thesis in Study 1 was narcissism; likewise, the dispositional narcissistic personality failed to predict cooperative behaviour in the PGG. Besides dispositional empathy and narcissism, the most widely studied individual difference is social value orientation, with most

research (Balliet, et al., 2009; Bogaert, et al., 2008) showing that it is a reliable tool for measuring an individual's social preference (social value orientation) to predict cooperative behaviour. However, as discussed in section 4.1 Introduction, the social value orientation measure is unlike self-report questionnaires (statements/descriptions of situations), as it involves decomposed games consisting of six primary items and nine optional secondary items which overlap with features that appear in actual social dilemma games. For example, one of the items of measuring social value orientation is "You receive and others receives 100-50; 94-56; 88-63; 81-69; 75-75; 69-81; 63-81; 63-88; 56-94; 50-100 matched items", the participants need to circle one of 9 items (Murphy & Ackermann, 2014). Because of this (highly similarity in situation setting), social value orientation has become a more reliable tool, to predict behaviour in other types of social dilemma, than empathy and narcissism, as it successfully distinguishes individual differences. Therefore, this casts doubt about the validity of the existing self-report questionnaire to reflect actual individual differences.

Certainly, complex social behaviours are almost always influenced by multiple components and mechanisms. "Social behaviour is the product of reciprocal interactions between the characteristics of the person and the characteristics of the situation." (Penner & Orom, 2010, p. 60). Social-cognitive processes are important because motives are not directly observable. Inferences are attributed to motives that underlie behaviour (e.g., Carlston & Graziano, 2010) and the motivation for any single act is usually ambiguous (Schroeder & Graziano, 2015). In the case of pro-social personality, it is unlikely that the social-cognitive components and emotional components will be activated by the same cues, or activated at the same time. In turn this may be the reason why it is not easy to reliably identify how these components combine and in turn then lead to behavioural differences (Schroeder & Graziano,

2015, p. 245). Therefore, for further investigations of the personality-behaviour link, multiple components need to be considered such that a more detailed profile of the individual, their own motives, their values, and their own pro-social tendencies are assessed, along with a variety of pro-social behaviours, and not just use a single social dilemma game.

7.2. Theoretical Considerations

As stated in Chapter 2, there were a variety of theories and models discussing the motivations of people acting cooperatively, essentially addressing the question: *Why do people cooperate?* The discussion here considers the implications of the work from this project in response to the existing models and theories exploring the basis behind cooperative behaviours.

Theories in the social psychology domain tend to explain the motivations of human cooperation either from the view of economic motivations (resource exchange) or from the view of social motivations (group identity). From the view of economic motivations, resource exchange is the main incentive for people to act cooperatively, both from a traditional rational choice model (Elster, 1986) and a more psychologically orientated framework, such as the interdependence theory (H. H. Kelley & Thibaut, 1978), SAVE (Keltner, et al., 2014). In contrast, from the view of social motivations, the main incentive for people to act cooperatively is because they associate cooperation with a particular identity, which is discussed by the appropriateness framework (Weber, et al., 2004) as well as the group engagement model (Tyler & Blader, 2003).

As indicated from Figure 3, Parks' integrated model explicitly points out that dispositional empathy affects the secure attachment system. This means it has a role in determining the dispositions to cooperate, and can influence cooperative decisions.

What is claimed is that dispositional empathy operates in such a way to transform actual behaviour through a motivational system, and this transformative process can be identified using Parks' Integrated Model of decision making in social dilemmas. However, the studies (Studies 1, 2 and 3) from this project failed to support the prediction that dispositional empathy is positively related to actual cooperative behaviour.

Why is it that, rather than empathy *per se*, personal social values promoted cooperation in the PGG as found in Study 2? In the social values condition of this study, the profiles concerning socially oriented values, such as family and friends, led to higher rates of cooperation than the economic values condition. One could speculate that, by sharing personal information regarding the social situation, the social values condition helped participants develop a sense of identity. As this was a value that they would willingly want to identify with, this in turn may have helped them form an attachment to the group. In contrast, in the economic values condition, the information participants shared was based on communicating a materialistic loss. As participants would have detected that the common theme was an identity regarding the loss of economic goods, this may have been an identity they were less willing to associate with. Therefore, under such circumstances this type of information sharing did not play a good enough motivating role to support cooperative behaviour, though it did not in turn lead to increases in defective behaviours, such as increased free riding. Taken together, these speculations would be consistent with identity-based theories (e.g., the appropriateness framework (Weber, et al., 2004) as well as the group engagement model (Tyler & Blader, 2003)).

Another central aim for the thesis was to explore the role of status on the empathy-cooperation link. The group engagement model explicitly points out the

importance of status. In this model, two types of status are considered, *pride* and *respect*. The former refers to the status of the group in large contexts, while the latter refers to one's status within one group. The status involved in Study 3 and Study 4 is consistent with status as viewed by the model as *respect*. Through manipulating the resources participants possessed, namely the financial tokens in the studies, status was created. As argued by the group engagement model, higher *respect* (status) affects an individual's identification judgment, and in turn results in acting in a more cooperative fashion. Moreover, the appropriateness framework also considers the importance of status, although not so obviously as the group engagement model. The appropriateness framework stresses the role of recognition of situation, identity and rules. Weber, et al. (2004) considered status as part of human's social structure (p. 294) and anticipated that the superficial features of the situation (different status within group) can lead to fundamentally different understandings, and therefore markedly different choices, whereas the rational choice model anticipates identical choices. Therefore, given the pattern of findings in Study 3, consistent with the appropriateness framework and the group engagement model, people are clearly sensitive to status and this informs the basis on which they make decisions that impact a group.

There has already been a large body of theoretical and empirical studies discussing whether empathy induction triggers egoism or altruism. However, the behavioural consequence of empathy induction, especially under the circumstance of the public goods problem, is still under theoretical consideration. Behaviour change is the ultimate goal for enriching research studies in behavioural and social science. Both the empathy-altruism hypothesis and negative-state relief hypothesis were not supported; because in the present project the behavioural consequence of empathy

were that it did not necessarily lead to cooperative decisions. However, a caveat could be that both hypotheses could be interpreted as being specific to helping behaviours rather than cooperative behaviours *per se*. The thesis extended both hypotheses in order to make the prediction that empathy induction produces the motivation (altruism from empathy-altruism hypothesis and egoism from negative-state relief hypothesis), to cooperate in a mixed-motives situation. Though, as has been clearly stated, the evidence from this thesis simply does not support this extended prediction.

7.3. Methodological Considerations

In each of the four studies that comprised this thesis the method used to uncover cooperative behaviour was the linear PGG. One of the key reasons for adopting this method is that there are fewer studies examining the link between empathy and cooperation in this type of social dilemma game as compared to other typical games (prisoner's dilemma, ultimatum game). However, having explored the link between empathy and cooperation across four studies, the following discussion now considers the potential methodological issues that may have contributed to the lack of evidence for the link between the two in this project. The specific focuses in this discussion are on: 1) the employment of an interactive deception method, 2) the involvement of financial incentives, and 3) the issue of effect sizes/sample sizes.

7.3.1. Interactive Deception

Interactive deception, to create a group interaction, was introduced in Studies 1, 2 and 3 in order to better observe intragroup cooperative behaviour under controlled conditions. In Studies 1 and 3, interactive deception did not appear to have any significant effect on cooperative decisions, whereas in Study 2 (personal values involved), interactive deception significantly influenced cooperative behaviour in the

PGG. However, in Study 4 where there was no interactive deception, there was also no evidence for an empathy-cooperation link. Taken together these findings raise questions regarding the extent to which interactive deception did in fact significantly impact on the lack of empathy-cooperation link. However, it is worth also recognizing that the lack of empathy-cooperation link in Studies 1- 3, may be the result of different reasons compared to Study 4.

In the version of the PGG used in the Studies 1, 2 and 3, three virtual players and only one real participant were involved. The reasons for using fictional players were to allow for careful manipulations of the range of empathy and the impact it would have on the participants' behaviour during the PGG. The feedback response of the three virtual players' contribution was pre-programmed based on real players' data from a published study. This type of experimental design involved two critical factors that are not the concern of studies using four players: a) is it acceptable to use a computer program to give feedback on the behaviour of other players in a PGG; b) is it acceptable to deceive players into believing that they are interacting with players online. With regards to the first issue, research on *tit-for-tat strategy* and proof of its success has often been demonstrated using a computer tournament (Axelrod & Hamilton, 1981). Alongside *tit-for-tat*, *random*, *downing*, *joss*, these types of feedback on decision-making behaviour in multi-player games is also provided through computer tournaments (Axelrod, 1984, p. 31), which in turn also seems to suggest that, at least some of the research community, do not deem the first issue as a problem. The second issue concerns deception that led participants to believe that they were interacting with others; this was defined as "interactive deception". The employment of "interactive deception" is common because it provides a practical solution to setting up social experiments with social dilemma games. However, what

it commonly done is that several participants are interacting with a social dilemma game in the same room, and this gives them the false sense that they are interacting with an anonymous partner in the room, when in fact they are interacting with a "fixed" virtual player (Rand, et al., 2012, Study 7). Other studies also adopt a type of pre-programmed strategy or pre-design strategy, similar to the one used in this project (Batson & Ahmad, 2001; Batson & Moran, 1999; Rumble, et al., 2010). Therefore, the experimental design is not at odds with prior published experimental work, and is an accepted method of studying group behaviour, and has been used as a method for measuring both empathy and cooperation.

The point of contention with regards to the use of interactive deception really is from the point of view of economists and behavioural economists. Instructions were presented so that participants were guided towards believing that they were interacting with three real players. Van Lange et al., (2013) commented that most social dilemma researchers tend to implement this kind of deception in their experimental studies. The use of deception is a provocative issue. Economists are less trusting of the findings of experiments that involve deception, and they argue that any form of deception will undermine the general validity of experiments (McClelland, 1985). Within psychology, Hertwig and Ortmann (2001) strongly advise against the use of deception, whereas others are more lenient in their recommendations (Christensen, 1988). Some suggest that, for many social psychological experiments, deception may seem inevitable, especially when it comes to inducing empathy and examining the effect on pro-social behaviours in economic games (Batson, 2011). Some empirical studies do not include measures to access whether participants believe the deception or not (Rumble, et al., 2010; Yamagishi, Mifune, Liu, & Pauling, 2008) while other studies that assess participants' belief in the experimental

deception omit the data from participants who expresses doubt regarding the plausibility of the deception (Batson & Ahmad, 2001; Batson & Moran, 1999).

The use of deception has become more and more extensive and a commonplace feature of social psychology experiments. Deception is employed in such experiments because it is important to keep the respondent unaware of the personality or attitude dimension that is under exploration, as thus when using deception it is possible to examine the participants' responses genuinely by minimizing the effects of subjective desirability (Kelman, 1967). Hertwig and Ortmann (2001) explicitly pointed out that the two benefits of using deception are: a) the experimenters can help to avoid the knowledge of the true purpose of a study that might affect behaviour; and b) without it, it can produce situations that are unlikely to arise naturally. The necessity of retaining deception as a methodological tool seems to be generally accepted in psychology. Moreover, some research studies have revealed that participants enjoyed the experience more, received more educational benefit from it, and did not mind being deceived (Christensen, 1988).

With the increased popularity of using deception in social psychological experiments, some special concerns are raised in terms of the negative consequences of its use. The use of deception is criticized repeatedly as ethically unacceptable and morally reprehensible by behaviour economists, because it involves deceit and lying. More importantly, the concern is more about its adequacy as a methodology for social psychology; namely, the extent to which the use of deception will affect the target behaviour that they intend to explore. This concern is also fully discussed alongside the present studies data. Given the mixed pattern of results revealed in the present thesis and subsequent complications of interpreting these findings with regards to the

effects of interactive deception on cooperation, the use of real players in future work is strongly recommended.

7.3.2. Financial Incentives Involved

Because economic games were used, the aim of the project was to adhere to some basic principles regarding the use of these types of games, in particular the use of incentives that were tied to decisions in the game. Put alternatively, decisions taken in a social dilemma game should have real consequences just as they do in real life. The aim of the project was to enhance the ecological validity of the four studies, and so all studies used financial incentives which were directly associated with participant's decision in the experiments. This is seemingly different from many other psychological studies using social dilemma paradigms where course credit or fixed amount money is the motivator to take part in the game (Batson & Ahmad, 2001; Batson & Moran, 1999), which in turn does not translate to real consequences for decisions taken in the game. Given that money is one of the most salient incentives that motivates human behaviour (Camera, Casari, & Bigoni, 2013), it is likely that this motivator may have contributed to weakening the empathy-cooperation link reported in prior studies (Batson & Ahmad, 2001; Batson & Moran, 1999).

Do financial incentives matter? Hertwig and Ortmann (2001) presented a full discussion and reached a conclusion that financial incentives matter more in some areas (e.g., games and markets) than in others (e.g., judgment and decision), in both psychological and economic domains. Yet, in the end, they still proposed that psychologists studying behavioural decision should consider using financial incentives when possible, while at the same time recognizing that this may interfere with participant's intrinsic motivation. It may well be the case that financial incentives that mimic real consequences for decisions taken in the real world make

participants more sensitive to the actual financial gains they may achieve, interfering with their intrinsic motivation to behave more pro-socially in social dilemma games. However, it is unclear how to resolve the problem of generating an analogue of social situations in which conflicts between personal and social gains occur, which have consequences that are not financially incentivised. Thus far, the literature appears to be split between studies that employ a flat-fee or course credit, and studies, particularly behavioural economic studies, in which financial incentives are critical to ensure both motivation, and real consequences of decisions taken. One example of a set of studies in the project that suggests that the use of financial incentives is important, are Studies 3 and 4, in which status is determined by the relative amount of resources. This is a reasonable analogue of real life situations in which the relative amount of resources can indeed influence the way in which people behave towards each other.

7.3.3. Sample Size, Effect Size and Statistical Power

Historically, researchers in psychology have relied heavily on null hypothesis statistical significance testing as a starting point for many of its analytic approaches (APA, 2010). In response, many have recommended that effect sizes be reported as a supplement to null hypothesis significance tests (C. O. Fritz, Morris, & Richler, 2012; K. Kelley & Preacher, 2012; Lakens, 2013; Peng, Chen, Chiang, & Chiang, 2013). This was particularly important in this project because the statistical analyses for the four studies resulted in null hypothesis significance tests. Therefore, in order to obtain a more generally interpretable, quantitative description of the size of an effect from the simple identification of statistical significance, the estimates of effect size were presented. This was deemed a useful way for determining the practical or theoretical importance of an effect, as well as the relative contribution of different factors or the

same factor in different circumstances, and the power of an analysis (C. O. Fritz, et al., 2012).

To infer the required sample size in each condition, there were two ways of obtaining the effect size 1) based on the previous published empirical studies; 2) based on the presumed generalized effect size (Cumming, 2014); to reach the statistical power (1-β >=. 80). In the three most closely related empirical studies (Batson & Ahmad, 2001; Batson & Moran, 1999; Rumble, et al., 2010), none of them reported sufficient statistical data to calculate the effect size of empathy-cooperation link, although all these studies reported a positive link. In this case, the second way of a presumed medium effect size for social science phenomena (f = 0.25) suggested by (J. Cohen, 1988) are followed. In this thesis, the tool G*power was used to conduct relevant statistical calculation such as effect size, required sample size and statistical power.

The thesis involves two types of statistical power, a prior power and a post hoc power (Faul, et al., 2007). In *a priori* power analysis (J. Cohen, 1988), sample size N is computed as a function of the required power level (1-β), the pre-specified significance level α, and the population effect size to be detected with probability (1-β). A priori power analysis provides an efficient method of controlling statistical power before a study is actually conducted and could be recommended whenever resources such as the time and money required for data collection are not critical. Whereas, a post hoc power analysis often makes sense after a study has already been conducted. It becomes possible to assess whether or not a published statistical test has in fact had a fair chance of rejecting an incorrect null hypothesis. In Studies 1 and 3, the prior power analyses were conducted to infer the required sample size (N). In Study 2, a post hoc power analysis was conducted, as showed in section 4.3.3 PGG

All Rounds. These statistical terminologies help better understand the basis on which a potential empathy-cooperation link could be detected in the studies included in this thesis. Given the power analyses conducted across the thesis, the actual sample sizes are close to or exceed the required sample sizes recommended by prior power analysis, and are in line or exceed prior published work in this area.

7.4. Implications and Ideas for Further Studies

The present project includes four studies each designed to explore the empathy-cooperation link. They present some challenges to previous work that purports to have shown that this is a reliable link. As a result, the discussion has highlighted several factors that may have contributed to the lack of reliable evidence for this link; moreover, these factors also point to possible future approaches to exploring the link. First, a great deal more attention should be focused on the personality-situation-behaviour approach instead of personality-behaviour approach to interpret the influence of individual differences on behaviour. It is important to establish the reliability of the association that many researchers have claimed exists between traits such as dispositional empathy and cooperative behaviours. Second, given this thesis only investigated repeated interaction between/amongst strangers, different relationship contexts in dyadic interaction could better expose the empathy-cooperation link. This is because if there is an established relationship, the inducted empathetic concern may have a more secure basis on which to influence behaviour – because the concern for the other is more likely to be genuine. Third, economic disparity between people is ever more salient an issue under conditions of economic crises in the real world, and other such unstable economic conditions that people experience on a day-to-day basis. Therefore, how economic disparity modulates the perception of status, which in turn effects the way in which people of different status

cooperate (or not) with each other, is an important avenue of research and clearly more work that builds on the impact of social status on cooperative behaviours will be ever more relevant, if the gap between high and low status continues to increase (Piketty, 2014). Moreover, if there are differences in the way that people with different status cooperate with each other, then it is ever more important to find ways in which cooperation (particularly of those with high status) can be promoted. This present project reveals that empathy only has a weak effect, and it targets people that already have an inclination to cooperate (i.e. low status group). So, the question would be, how can people in high status positions cooperate more with those of low status conditions? As yet, the empirical work that currently exists cannot provide a good answer to this.

In terms of methodology, there are several approaches that were taken in this current project that have not commonly been adopted in social psychology studies examining the link between empathy and cooperation, and it may be the case that the evidence base needs to be improved by using key best practices. First, each research study should report the effect size. This enables following studies to accurately calculate required sample sizes for each experimental condition. Second, a prior statistical power test should be calculated instead of a post hoc statistical power test in order to avoid some of the concerns regarding the reliability of the findings reported. Third, experiments should introduce financial incentives especially in contexts in which decisions are made that carry costs – as they would in the real world, For example, in social exchanges in which there are differences in status (e.g., real life management contexts). Finally, the experimental design should avoid employing deception in any form, and based on the work from this project, many of the

problematic issues may have been avoided if an approach like this was adopted consistently throughout the project.

7.5. Conclusion

Public goods problems, as multiple-person social dilemmas, are situations in which a person's individual rationality leads to collective irrationality. That is, behaviour that is directed towards the personal benefit of the individual in turn costs the rest of a group. Thus, the most challenging problem for public goods is free riding, that is, placing one's own interest above the interests of others, by contributing next to nothing, and benefiting from the contributions of others. This project was designed to find possible solutions to the public goods problem, based chiefly on the idea that a key emotion relevant in social exchanges, namely empathy, can promote cooperative behaviour, which in turn could reduce free riding. Moreover, another underpinning assumption of this project was that, people's motivations, when faced with social interactions generally, are weighted towards being socially proactive, - i.e. people are not completely driven to free ride in all social exchanges. Following this, the whole project involved manipulating empathic concern for others in a group so as to, in turn, trigger increases in cooperative behaviour; thus attempting to solve the public goods problems. However, the series of studies in this thesis only found a limited effect of empathy as a means of resolving the individual-collective interest conflict. Instead other factors were more prominent in determining the level of contribution in the public goods game, particularly the shared values of the group (more cooperative in social shared values relative to economic values), and relative status (particularly the basis on which status was achieved – i.e. by chance or by effort). Possible explanations that may have contributed to the weak empathy-cooperation link were speculated to be the result of two core concerns. The first of

which was the introduction of deception, namely that participants were led to believe they were interacting with other players in the game, when they were in fact not interacting with anyone. This may have interfered with the way in which participants were playing the game. The second was the introduction of real financial incentives, which may have overridden the effects of empathy-induced altruism. One of the most important goals for future work is for researchers to build theories, which pay particular regards to the modulating effect of status on the empathy-cooperation link, in mixed-motive social dilemmas. Finally, based on the review of the literature, the current issues that still pervade are substantive, and they concern the consistency with which of key terms (e.g., empathy, cooperation) are used in theory and in empirical practice, and this should continue to direct future studies in this field.

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Appendices

Appendix 1: Interpersonal Reactivity Index (adopted from (Davis, 1983))

INTERPERSONAL REACTIVITY INDEX

The following statements inquire about your thoughts and feelings in a variety of situations. For each item, indicate how well it describes you by choosing the appropriate letter on the scale at the top of the page: 1, 2, 3, 4, or 5. When you have decided on your answer, fill in the letter on the answer sheet next to the item number. READ EACH ITEM CAREFULLY BEFORE RESPONDING. Answer as honestly as you can. Thank you.

ANSWER SCALE:

1	2	3	4	5
DOES NOT DESCRIBE ME WELL				DESCRIBES ME VERY WELL

1. I daydream and fantasize, with some regularity, about things that might happen to me. (FS)
2. I often have tender, concerned feelings for people less fortunate than me. (EC)
3. I sometimes find it difficult to see things from the "other guy's" point of view. (PT) (-)
4. Sometimes I don't feel very sorry for other people when they are having problems. (EC) (-)
5. I really get involved with the feelings of the characters in a novel. (FS)
6. In emergency situations, I feel apprehensive and ill-at-ease. (PD)
7. I am usually objective when I watch a movie or play, and I don't often get completely caught up in it. (FS) (-)
8. I try to look at everybody's side of a disagreement before I make a decision. (PT)
9. When I see someone being taken advantage of, I feel kind of protective towards them. (EC)
10. I sometimes feel helpless when I am in the middle of a very emotional situation. (PD)
11. I sometimes try to understand my friends better by imagining how things look from their perspective. (PT)
12. Becoming extremely involved in a good book or movie is somewhat rare for me. (FS) (-)
13. When I see someone get hurt, I tend to remain calm. (PD) (-)
14. Other people's misfortunes do not usually disturb me a great deal. (EC) (-)
15. If I'm sure I'm right about something, I don't waste much time listening to other people's arguments. (PT) (-)
16. After seeing a play or movie, I have felt as though I were one of the characters. (FS)
17. Being in a tense emotional situation scares me. (PD)

18. When I see someone being treated unfairly, I sometimes don't feel very much pity for them. (EC) (-)

19. I am usually pretty effective in dealing with emergencies. (PD) (-)

20. I am often quite touched by things that I see happen. (EC)

21. I believe that there are two sides to every question and try to look at them both. (PT)

22. I would describe myself as a pretty soft-hearted person. (EC)

23. When I watch a good movie, I can very easily put myself in the place of a leading character. (FS)

24. I tend to lose control during emergencies. (PD)

25. When I'm upset at someone, I usually try to "put myself in his shoes" for a while. (PT)

26When I am reading an interesting story or novel, I imagine how I would feel if the events in the story were happening to me. (FS)

27. When I see someone who badly needs help in an emergency, I go to pieces. (PD)

28. Before criticizing somebody, I try to imagine how I would feel if I were in their place. (PT)

NOTE:(-) denotes item to be scored in reverse fashion (6 minus their scoring)
PT = perspective-taking scale
FS = fantasy scale
EC = empathic concern scale
PD = personal distress scale

Appendix 2: The Pre-designed Profiles for Study 1

(Break up) Jennifer Law,

Well, I don’t know if this will be interesting to anybody else, but the only thing I can think of is that two weeks ago my boyfriend and I broke up. We’ve been going out together since year 12 in school and had kept the relationship up since university. It has been great going out while we have been together at QMUL as well. I thought he felt the same, but things have changed. Now he wants to date other people. This has got me down and been on my mind, been a bit hard to cope.

(Car accident) Rebecca Thornton,

So, my friend was driving after we went shopping, and we ended up in a car crash. We were hit on the passenger side, front. The other driver was going much faster than the speed limit and crashed into us. All I remember from the crash was glass flying everywhere and the loudest, most terrible noise of metal crushing metal. We were ok because we wearing our seat belts, but we both got whiplash and I ended up with a broken rib. It was scary knowing that if we hadn't been wearing our seat belts, we could have died.

(Mobile phone was stolen) Michael Sullivan,

The upsetting thing that happened to me in the last month was my mobile phone was stolen. I went to Paris with my friends. We were focusing too much on taking photographs of an amazing view and not paying attention to what was happening around us. On getting back to the hotel after a long tube ride I noticed my iPhone was missing. My mother gave me the phone as a gift only 2 months ago.

Neutral information about those 3 participants:

1) Jennifer Law, I enjoy swimming, although I don't swim very well.
2) Rebecca Thornton, ----- I ride a bike to university every day.
3) Michael Sullivan, ----- I run most mornings.

Appendix 3: Debriefing Questions for Study 1

1) Did it appear to you that there were, in fact, three other players competing alongside you at the exact time during this experiment?
2) When deciding the amount of tokens to contribute towards the pot, was there a particular strategy or rule that you applied?
3) Did you find any flaws with this experiment? Were the instructions clear to you?
4) Did you know the three other players before you attended the experiment?
5) What was your motive for attending this experiment today?

Appendix 4: Pre-questions for Study 2

Personal information

Full Name:_____ Gender: _____Age:_____

Q1: Describe an event that has happened to you that has made you happy in the last year.

Q2: Describe an event that has happened to you that has made you sad in the last year.

Q3: What types of sports do you enjoy?

Q4: What hobbies do you have?

Q5: What's your favourite food?

Appendix 5: Three Pairs Value Stories for Study 2

Stories

High frequency value stories: (Family, Friends, Health)

Family

My grandfather had an operation recently. I went to visit him in hospital whenever I could. It has been worrying because I am really close to him and it's been very stressful and emotion for me and my family. But he is recovering now.

Friends

I speak to my best friend nearly every day. She is the closest person to me outside of my family. Recently we fell out. This isn't the first time that this has happened, and I know that we can fix this, but it is still upsetting.

Health

I was riding my bicycle down the main road last month. I lost control and crashed into a lamppost. The bike didn't flip, thankfully, but my arm was severely injured. I had to go to hospital, and they put my arm in a sling. It took me approximately 3 weeks to recover.

Low frequency value stories (Pet, Phone, Bicycle)

Pet

My pet dog Scruffy had an operation recently. I went to visit him at the vets whenever I could. It has been worrying because I am really close to him and it's been very stressful and emotion for me and my family. But he is recovering now.

Phone

I speak on my mobile phone nearly every day. It is the object most close to me other than my laptop. Recently I broke my phone. It fell out of my bag. This isn't the first time that this has happened, and I know that I can fix this, but it is still upsetting.

Bicycle

I was riding my bicycle down the main road last month. I lost control and crashed into a lamppost. The bike didn't flip, but unfortunately it did get bust up. I had to take it into the repair shop, because it was seriously damaged. It took approximately 3 weeks to get fixed.

Appendix 6: Debriefing Questions for Study 2

Debriefing questions:

1) Did it appear to you that there were, in fact, three other players competing alongside you at the exact time during this experiment?
2) When deciding the amount of tokens to contribute towards the pot, was there a particular strategy or rule that you applied?
3) Did you find any flaws with this experiment? Were the instructions clear to you?
4) Did you know the three other players before you attended the experiment?
5) What was your motive for attending this experiment today?
6) Do you know how could you get the maximal money theoretically?

Appendix 7: The Digit Cancellation Test for Experiment 3B (Study 3)

Digit Cancellation Test

Please Cross Out all the number 3 in two minutes.

3

5	8	3	2	0	2	5	0	6	4	4	6	8	3	5	9	1	3	1	8	9	6	5
8	2	1	3	5	5	0	8	7	7	7	5	0	7	1	9	6	8	3	2	0	7	0
2	6	6	3	4	7	0	0	2	1	8	3	2	2	1	4	8	8	5	9	5	8	8
9	1	3	0	6	5	3	8	8	8	0	9	4	6	1	9	7	3	5	8	0	5	5
4	2	3	5	5	9	5	5	7	9	1	2	3	8	0	3	2	6	1	7	4	0	6
7	0	0	2	2	1	5	1	5	7	4	5	3	2	2	6	3	2	1	6	5	5	6
5	7	8	4	1	4	2	4	9	7	7	7	0	4	2	5	3	9	3	5	8	0	6
3	9	4	9	0	2	9	5	5	4	5	2	7	1	3	8	2	6	8	3	6	7	9
4	7	0	9	0	5	8	0	2	7	7	8	4	1	1	2	3	2	1	8	2	6	1
7	7	9	1	3	0	4	9	8	5	1	5	6	0	9	6	0	1	5	5	9	5	4
9	5	2	5	7	0	9	6	8	5	6	9	5	0	5	6	4	5	1	7	7	2	8
8	2	6	3	3	3	5	4	3	3	6	3	0	6	3	6	4	2	8	9	5	7	4
1	2	6	7	6	0	2	8	3	7	0	9	3	4	2	3	0	0	7	7	8	7	7
1	2	2	5	9	1	8	2	8	1	7	9	9	6	3	3	6	1	5	8	3	3	1
8	9	9	2	6	3	4	8	4	0	9	5	9	8	3	1	0	0	3	4	3	0	6
6	2	6	4	5	0	2	3	0	5	1	1	3	7	9	1	1	6	4	8	6	8	9
0	5	5	8	2	7	9	9	7	5	3	3	6	9	4	2	6	7	8	3	0	7	1
5	2	8	7	7	6	1	2	4	5	1	2	5	7	6	3	5	8	9	2	3	5	4
8	4	5	1	8	1	5	9	2	6	7	2	8	9	0	5	0	2	4	4	1	7	0
3	1	0	1	8	0	9	5	3	9	1	2	9	7	5	9	2	8	5	0	8	7	2
2	3	4	3	5	4	6	5	3	9	9	0	0	2	7	0	3	6	9	8	7	3	6
2	7	8	8	6	4	6	9	7	9	0	8	8	7	6	7	1	0	5	2	6	9	8
2	8	7	6	9	2	4	7	0	6	0	4	5	6	5	9	0	3	7	6	9	5	3
3	9	5	6	4	8	5	3	7	9	8	5	1	7	8	8	4	5	6	7	8	2	0
5	5	0	1	2	5	9	0	8	1	8	3	2	7	9	1	3	6	4	6	5	2	9
2	8	7	0	6	0	3	0	2	3	5	9	7	3	3	9	8	4	2	6	0	8	4
6	7	4	8	2	8	2	8	6	0	7	9	5	5	7	4	5	8	6	2	0	3	9
8	0	6	4	6	4	4	4	2	5	5	9	5	7	2	8	8	1	1	4	5	1	3
1	1	7	4	0	0	2	3	6	7	5	6	9	5	0	8	4	9	1	9	9	9	6
7	2	8	4	9	1	4	5	0	1	1	7	5	9	0	3	0	8	8	2	8	6	0
6	2	0	5	2	9	6	8	9	4	5	3	0	1	3	6	0	3	1	2	9	9	5
4	1	7	2	6	8	5	4	6	0	0	5	1	9	3	8	1	6	6	2	9	1	3
9	2	5	2	3	6	3	6	3	3	0	2	1	7	0	0	3	3	4	7	3	8	3
0	2	0	8	7	0	8	0	0	7	3	7	1	2	1	0	7	0	6	3	3	4	9
5	9	2	9	0	3	3	3	8	5	6	7	6	6	4	3	1	5	7	6	7	5	7
2	3	1	6	0	4	4	1	6	7	8	0	6	4	7	1	2	8	3	1	2	0	3
0	2	5	3	9	0	5	2	8	6	6	2	3	1	6	0	6	7	0	0	9	5	6
5	4	5	5	0	5	0	3	5	8	6	2	1	5	7	7	2	9	8	3	9	6	4
8	3	0	6	3	3	2	2	0	0	6	6	3	9	4	3	3	3	3	2	3	4	5
5	7	9	8	5	4	1	2	9	1	7	7	7	4	9	8	1	3	6	9	3	0	9

Appendix 8: The Pre-task Mathematic Calculation Test for Study 4

Participant No._____

Pre- Mathematic Calculation Test

Assume You are Player1, You and Player2 are given 20 tokens Each. Both need to contributie some, all or none of their tokens to the group pot (from 0 to 20). The group pot will increase by 40% and then be split evenly between both players.
Thus, your money will be calculated as follows:

$$\square = (20 - \text{your contribution}) + \frac{(\text{your contribution} + \text{Player2 contribution}) * 1.4)}{2}$$

1) IF your contribution= 20; Player2 contribution = 20;

Your Money = ☐

2) IF your contribution= 0; Player2 contribution = 0:

Your Money = ☐

3) IF your contribution= 20; Player2 contribution = 0;

Your Money = ☐

4) IF your contribution= 0; Player2 contribution = 20;

Your Money = ☐

Appendix 9: Post-question for High-empathy Condition (No-empathy Condition) for Study 4

Name: _____Gender: _____Age: _____Participant No._____

Q: Describe an event that has happened to you that has made you sad in the last year. (Q: Describe a type of sports that you enjoy.)

Participant No._____

To what extent do you feel compassion or pity about your partners' stories written in the note? (**1= not at all to 9 = very much)**

1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
not at all								**very much**

Appendix 10: Debriefing Questions for Study 4

1) When deciding the amount of tokens to contribute towards the pot, was there a particular strategy or rule that you applied?
2) Were the instructions clear to you?
3) Did you know how to get the maximal money for yourself ideally?
4) Did you know how to make your partner to get the maximal money?
5) Did you know how to get the maximal money for both of you?
6) What did you think of the note about your partner? Was it real?