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## **The Game Factory: Using Cooperative Games to Promote Pro-social Behaviour Among Children**

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### **ABSTRACT**

This study examines the use of a cooperative physical games program “The Game Factory” on social behaviour among children. Children are required to work together towards positive collective outcomes. A pretest-intervention-posttest design is used. Parents and teachers assessed 90 Australian primary school children in two experimental groups and one control group. Experimental groups undertook 6 fortnightly program sessions. Results suggest that the program results in significantly improved pro-social behaviour in the school environment and general improvements in pro-social behaviour in the home environment. Findings support the use of cooperative games to increase pro-social behaviour among children.

**Key words:** child behaviour, classroom intervention, co-operative games, Game Factory

### **INTRODUCTION**

The following study represents the first evaluation of the effects of “The Game Factory”, a classroom based cooperative games program, on pro-social behaviour amongst children aged 9 to 12 years. Previous research suggests that a significant relationship exists between positive social relationships and wellbeing (e.g., Cole, Lazarick & Howard, 1987). Children in healthy social relationships generally perform better academically, sportingly and have greater self-esteem and self-worth than those with relationship problems (e.g., Battistich, Soloman, Watson, Soloman & Schaps, 1989). Battistich et al (1989) found that children unable to form good relationships are more likely to have increased rates of depression, anxiety, drug abuse, eating disorders and many more other psychiatric and social problems than are socially competent children.

The Game Factory consists of a program of physical games designed to teach skills that help children better understand and control their own behaviour in various social situations. Games are designed for inclusion of children of all abilities. Group co-operation and inclusion of all members is essential to the success of all games within the program, thus, children learn the practice of good social skills in the promotion of pro-social behaviour.

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## Pro-social Behaviour

Many adult mental health problems have long been attributed to a lack of pro-social behaviour during early childhood (e.g., Bowlby, 1977, 1981). Other researchers have suggested that social development problems become more problematic over time (e.g., Strain & Odom, 1986). Strategies for developing social skills in all children have varied considerably as a result of differing schools of thought on approaches to social skills training. What is readily apparent is the shift towards a more pedagogic approach, where social skills are actively taught in all children, as opposed to the psychotherapeutic model that prevailed throughout the 1970’s, which suggested that social skills would simply develop given the right circumstances.

Goldstein and McGinnis (1997) identified three major psychological approaches to social skills that were widely used in the 1970’s. The psychoanalytical school of thought reasoned that through interpretation of unconscious thoughts, the child would develop latent awareness in conjunction with more appropriate social behaviour. The humanistic approach centred on providing an empathic and accepting environment in the hope that children would subsequently make better choices regarding their behaviour. The behaviour modification approach sought to reinforce appropriate behaviours and so enhance the probability that these healthy behaviours would reoccur.

More recently, teaching models are taking their place on the forefront of social skills training. Based on these principals of social learning, interventions and teaching models such as the “Boys Town Education Model” (Dowd, Tobias, Connolly, Criste & Nelson., 1993) and “Skillstreaming the Adolescent” (Goldstein, Sprafkin, Gershaw, & Klein, 1998) have been implemented. The social skills training approach is further validated by research that shows it is indeed possible to teach appropriate social skills to students. The challenge lies in making sure the students can generalize these skills to other settings and situations (Mathur & Rutherford, 1996). There remains a need to conduct interventions that can successfully promote the generalisation of social skills taught in one setting to other settings and contexts. The key may be in the delivery methodology, which has varied from individual focused to group focused delivery models. If models focus on individuals who have experienced a deficiency in social skills, rather than on the whole group, they may be unable to address social behaviour in a natural setting. In addition only a minority of children (those exhibiting problem behaviour) will be targeted, as opposed to all children. The Game Factory is an inclusive program taught in general education rather than special needs settings.

The delivery model, the target group and the setting all need to be considered in interventions to promote pro-social behaviour. Although some interventions employ a delivery model consisting of variations on situational role-play, cooperative problem solving skills and feedback from facilitators, important differences lie in the target group and setting.

Many programs have focused on delivering social skills to identified problem individuals in specialised settings such as clinics and treatment centres (e.g., Kazdin, Bass, Siegel, & Thomas, 1989). This has many limitations over class-based programs such as the Game Factory. First, problem children need to be identified so that they can be referred onto the appropriate services, leading to the potential that a proportion of less readily identifiable children who will benefit from this intervention may be overlooked. There is also the problem of stigmatising children by removing them from their peers for remedial therapy (Briggs, MacKay & Miller, 1995).

The Game Factory operates on the principal that social skills are best learnt in social situations. Children do the majority of their social interaction in the classroom setting. In this cooperative situation, children who may not show readily apparent manifestations of problems with social behaviour will be automatically included in the intervention. Children not only learn important principles of social competency, but also play a role in teaching these to their peers.

Strategies of teaching social problem solving skills to classes of children have been used with positive results in both primary schools and in middle schools (e.g., Dill, 2000). A good example is described in “The Special Edge Behaviour - A Whole-School Model of Behaviour Reform”, published by the California Department of Education (2000). This program is valuable in its inclusion of the 70-80% of students without obvious serious problem behaviours. These students have still benefited from “primary preventative techniques” using universal interventions, which are implemented through a school-wide system.

Strategies to promote the generalisation of pro-social behaviour across the spectrum have been discussed as long ago as Stokes and Bayer (1977) who suggested that when students are taught social skills, it is important to teach them in as natural an environment as possible. Stokes and Bayer suggested that unless social skills can be reinforced in a natural setting, they will not be utilised and taken on board by students. Class groups are an example of a natural situation where social skills can be both learnt and applied. Stokes and Bayer state that social skills need to be “loosely” taught. This means the intervention must be flexible enough to mould to students’ demands. It is believed that methods that employ tighter controls may work against skill generalization. In line with this thinking, The Game Factory is designed to be tailored by the facilitator to suit the immediate needs of the class.

Stokes and Bayer also suggested that reinforcement should be used sparingly. This is because it is necessary to taper back reinforcement in the hope that students will be able to then take on an active role in reinforcing their own behaviours. Facilitators need to realize that reinforcement in natural settings often occurs infrequently. Finally, the students themselves need to learn how to generalize, which can be done by providing opportunities in games to apply principles they have learnt in previous sessions to everyday situations.

Numerous investigations have analysed the relationship between play and integral child development, concluding that play is a vital activity of great importance in human development (e.g., Garaigardobil, Maganto & Etxeberria, 1996; Hansen, Meissler & Ovens 2000; Landazabel, 1999). In general, the results of these studies suggest that child play is systematically related to personal and social development (e.g., Landazabel, 1999). Playing games allow children to communicate, socialize and interact with their peers while forming relationships, promoting moral consciousness and self-awareness. Playing games has been found to promote positive effects and interactions among peers, and less aggressive and hyperactive behaviour (e.g., Carlson, 1999) to aid in the development of social skills and pro-social behaviour, as well as a decrease in levels of aggressive behaviour (e.g., Garaigardobil et al 1996).

### **The Game Factory program**

The Game Factory is a program of cooperative physical games, which have been structured to make group cooperation essential to game success and to encourage pro-social skills. Students of all abilities learn skills and mechanisms, which will help them to better understand and control their own behaviour. The program consists of a compilation of physical games requiring the use of minimal props, to be facilitated by a trained teacher. The games challenge and encourage children’s resilience while requiring cooperation to succeed. Importantly, success is not determined on an individual basis, but rather as an overall group success. Previous research has found that the use of cooperative games over and above competitive ones enables children to more readily focus on the experience of play rather than only on the outcome (e.g., Orlick, 1982).

The Game Factory games aim to help children analyse their individual and group behaviours. In these games it is important for the children to think about consequences before they act. The games require recognition of the personal skills needed for teamwork and the ability to resist negative thoughts and negative peer pressure.

Two examples of games implemented in this study are "Islands" and "Timeball" (McCaskill, 1994). Islands is a game that requires the children to have close physical contact with others, and is particularly useful for integration of isolated students into the group or class. A hula-hoop is placed on the ground for approximately every three children in the class. The children walk around the hoops for a minute or two until the teacher blows a whistle. They are then required to stand inside the hoops in groups of three or more. This game can then be further developed to be conducted in a certain minimum time span, or may require students to form groups that must include both boys and girls. Children are encouraged to break from their normal circle of friends to achieve the overall class goal. Decisions must be made to join a group to achieve a successful outcome. Due to the relative size of the hoops to students, players must hold onto each other to maintain balance. This close physical contact has been incorporated into the game to help break down psychological barriers between children.

Timeball is a game that requires good communication, concentration and eye contact. Children are asked to spread out and stand with their feet together and a ball is given to one student. All standing children are required to keep their feet together once the teacher blows the whistle. The ball is passed from one child to another with the child who has passed the ball sitting down. The overall aim of the game is to have everyone sitting down without the ball having touched the ground. Initially, the children are encouraged to complete the game as quickly as possible with an overall time-goal later employed.

There are various components to instruction of the Game Factory games that are designed to develop pro-social behaviour. First, each game begins with an explanation of the goals and objectives of the game itself. This provides the students with perspective and a context in which to understand the processes involved. Second, in order to comprehend the value of concepts being taught, they are reinforced through practical application in the game play process. Students experience first hand how the concepts of pro-social interactions through group cooperation and support are integral to the success of the games.

Third, each of the games is not simply played once, but repeated until the group has reached a level of proficiency acceptable to the facilitator. Between each attempt, instruction and feedback given by the facilitator encourage the students to think critically about how their actions directly impact upon the process, and how cooperation and cohesiveness are essential to overall success.

Finally, after each session of games is complete, students are given a summary of concepts and values that arose during the intervention and are told to go away and reflect on these. This level of introspection is important in not only reinforcing what the students have learnt about themselves, but also on how they interacted with others and how they can implement their newly developed skills into other parts of their lives. Thus, the nature of the intervention is such that the development of better pro-social behaviour is a process that the students are not only instructed in, but are also able to experience for themselves under the careful guidance of the facilitator. It is then left to the individuals to reflect on their experience and incorporate it into their daily activities. It is suggested that skills taught in a natural environment like the Game Factory are more easily incorporated into daily living as opposed to those interventions that are compartmentalized in an artificial arena.

The Game Factory program was developed in 1990 by Wilson McCaskill. McCaskill a qualified drama teacher, has spent over twenty years teaching drama to adults and children in Perth, Western Australia. Co-operative games are frequently used amongst drama students to increase group cohesion and explore personalities. Having witnessed the success of co-operative games in also improving prosocial behaviour amongst the children in drama classes, McCaskill developed the Game Factory Program for school children in 1990. McCaskill and the Game Factory receive frequent, ongoing positive feedback from schools using this program. The perceived success of the games has resulted in over 500 Australian primary schools adopting the program as part of their curriculum by 2004. However, before this pilot study, there has been no

formal evaluation of this program. This study aims to evaluate the aims of The Game Factory to increase pro-social behaviour among children.

Since, the skills of McCaskill have frequently been inextricably linked to the success of the Game Factory program, it was considered important to assess both the effectiveness of McCaskill running the games, and also the effectiveness of the games run by another facilitator. In so doing, some distinction between the effectiveness of the games and the effectiveness of the game as facilitated by McCaskill, could be made.

In addition, to two types of facilitator, two types of judge participated in the study, parents and three class teachers. This was considered to be important due to the importance of effects generalisation. Behavioural changes detected by parents arguably represent broader generalisation than any changes detected by teachers. It is accepted that parents may exhibit a bias towards their own child’s level of prosocial behaviour, particularly if they are aware of the Game Factory Program, however parents remain important judges as they see their children in an out-of-school environment.

The three class teachers acting as judges had all taught some of the children participating in the study in the previous year. In this previous year, children had been split into different class groups providing opportunity to examine any effects of teacher bias in assessment. Teachers could be asked to assess the prosocial behaviour of some children from across all three conditions before the experiment was conducted (ie the children they had previously taught). An absence of difference between initial teacher ratings would then support the notion of post-experimental assessment differences being due to experimental condition rather than to differences in teacher assessment style.

## METHOD

Ninety children aged 9-12 years, were distributed across 3 classes attending Glendale Primary School in Western Australia. Glendale Primary School is a mainstream primary school situated in a mid-socio-economic area in metropolitan Perth. Each class was randomly picked for inclusion in either experimental or control conditions. This random process resulted in Classes 1 and 2 being assigned to the experimental condition while Class 3 was designated as the control.

McCaskill, the Game Factory’s main developer and key facilitator, facilitated Class 1 as an ‘ideal facilitator’. His group, Class 1, consisted of 32 grade 7 students; aged 10-12 (mean age 11.18 years). 13 (42%) were girls and 18 (58%) were boys.

Temple, the principle teacher of Glendale Primary School, facilitated Class 2. Temple was initially trained by McCaskill in the facilitation of the Game Factory and as such represents an ideally trained teacher. Temple was trained during a full day workshop, attended by ten to twenty other teachers. McCaskill conducts these teacher training workshops on a regular basis, between ten and forty teachers attend most day workshops. Workshops are run at a cost to the teachers in line with other further education training days. Temple had also received the advantage of being able to observe McCaskill facilitate the Game Factory program on approximately ten occasions. She did not ordinarily teach any of the students participating in the study. Her group, Class 2, consisted of 29 grade 5 and grade 6 students; aged 9-11 (mean age 9.8 years). Fourteen (56%) were girls and 11 (44%) were boys.

Class 3 was designated as the control group. This class received additional physical education instead of the Game Factory sessions. This group consisted of 29 grade 6 and grade 7 students; aged 10-12 (mean age 10.59). 14 (48%) were girls and 15 (52%) were boys.

## Materials

The following pro-social behaviour scales were administered to parents and teachers, as appropriate, immediately before and after the intervention. All measures are contained in The Child Psychology Portfolio (Sclare, 1997). It was believed that the inclusion of two measures of pro-social behaviour would provide the opportunity for greater reliability and validity of findings.

***The Pro-social Behaviour Questionnaire*** (PBQ; Weir, Stevenson & Graham, 1980; Weir & Duveen 1981). This questionnaire provides a rating of the positive aspects of children's interpersonal and social behaviour. Parents, carers and/or teachers are asked to rate how much behavioural statements have applied to the child over the previous school term. It involves 20 items, for example "If there is a quarrel or dispute will try to stop it", "Will try to help someone who has been hurt". The items are rated on a three-point scale: 'rarely applies', 'applies somewhat', or 'certainly applies', being scored 0, 1, and 2 respectively. Scores range between 0-40 with a higher score indicating higher pro-social behaviour. Psychometric studies revealed satisfactory short-term test-retest reliability (0.91,  $p < 0.001$ ) and moderate inter-rater reliability (0.66,  $p < 0.001$ ). PBQ achieves face validity in that it adequately samples behaviours which teacher's view as pro-social, established by comparing PBQ scores on a sample of children to several other measures of their behaviour. The scale proved to be reliable at time one,  $n = 82$ , Cronbach's  $\alpha = 0.93$ .

***Revised Rutter Parent Pro-Social Behaviour Sub-Scale for School-Age Children & Revised Rutter Teacher Pro-Social Behaviour Sub-Scale for School-Age Children.*** These scales come from revised versions of the original Rutter parents and teacher scales (Rutter, 1967; Rutter, Tizard & Whitmore, 1970). They focus on pro-social behaviour. The teacher scale contains 20 pro-social items whereas the parents scale contains 10 pro-social items. The Teachers and parents are asked to compare each item to the child's behaviour over the previous three months. An example of the items on the teacher scale is: "Offers to share rulers, pencils, etc., being used in a task". An example of an item on the scale for parents is "Considerate of other people's feelings." All items are rated on a three-point scale: 'does not apply', 'applies somewhat', or 'certainly applies', being scored 0, 1, and 2 respectively. As yet, there is no psychometric evaluation of these scales, but the original *Rutter Parents' (A) and Teachers' (B) Scales* and their A (2) and B (2) modifications have been extensively evaluated for their psychometric properties. In addition, Elander and Rutter (1996) have reviewed available psychometric information and concluded that the scales do seem reliable. The psychometric properties of the two sub-scales proved to be reliable at time one and so could be used for subsequent analyses: Parents' pro-social behaviour scale,  $n = 62$ , Cronbach's  $\alpha = 0.78$ . Teachers' pro-social behaviour scale,  $n = 82$ , Cronbach's  $\alpha = 0.92$ .

## Procedure

This study used a 3-group design with pretest-posttest measurements, with one control group and two experimental groups. The research was conducted throughout term 1 (January - April 2002) of a 4-term primary school year.

During the first weeks of the school term, pretest scales were completed. In the next phase the Game Factory program was implemented. This consisted of one of six fortnightly game sessions lasting approximately 60 minutes and comprising of 3-5 group games. Intervention sessions for each class took place on the same day of the week once every two weeks. They were conducted in the primary school undercover assembly area. All assessments were repeated once the intervention had been completed twelve weeks after the first stage of data collection. The control group received physical education for a 60 minute time period on the same day as the interventions.

Consenting parents of the children and the regular teacher of each class performed the assessments. The previous year’s teachers also completed the pretest assessment for all children participating.

## RESULTS

### Researcher Observations

The Game Factory sessions were observed by all researchers. During the sessions all researchers noticed that the children generally enjoyed participating in the sessions and were keen to play all games. Particular attention was paid to children who were separated from set social groups due to shyness or disability and children who chose to stand out. It was noted that since the aims of the games could only be achieved through group co-operation, the outsiders were encouraged to join in by both the facilitator and other children. This benefited shy and reserved children as they were able to increase interpersonal attraction and cohesiveness within the group. Children trying to go against the group norms and stand out were also encouraged to join in by the facilitator and other children. They were then also able to experience increased group cohesion and a sense of belonging without a need to stand out or rebel.

The observers all commented on the increase in interpersonal attraction between all group members and subsequent increased group cohesiveness throughout the sessions.

All assessment data was collected and quantitatively analysed using the SPSS (Statistics Package for Social Science).

### Findings from teachers evaluations

An ANOVA was conducted between teacher’s assessments of pupils at time one (each teacher assessed children they had taught the previous year). Children from each of the previous year classes had been reallocated to different groups for the current year, and so each of the previous year’s classes was represented across all three current classes. Thus, each teacher was initially assessing children from each of the three study conditions. No significant differences were detected between the teachers initial assessment of the children, thus, any differences observed in the results are more likely to be due to differences in class behaviour rather than due to differences in teacher assessment. Teachers completed assessments at both time points for 27/32 of the Class 1 children, 28/29 of the Class 2 children and 28/29 of the Class 3 control group children.

Table One shows means and standard deviations for all teacher scores for teachers who completed the assessments at both time points.

***Pro-social Behaviour Questionnaire:*** An ANOVA was performed to compare the findings between groups across the two time periods. At time one the control group had significantly better social behaviour than McCaskill’s Class 1 group who had significantly better social behaviour than Temple’s Class 2 group ( $F(2,86) = 7.47, p < 0.01$ ). Results showed that there was a significant change over time for the three groups ( $F(1, 86) = 4.52, p < 0.05$ ). Results also showed a significant change between the groups over time ( $F(2, 86) = 18.78, p < 0.001$ ). All groups had a significant change in pro-social behaviour. Both the experimental groups showed a significant improvement in social behaviour, while the control group became significantly worse. Please see Figure 1

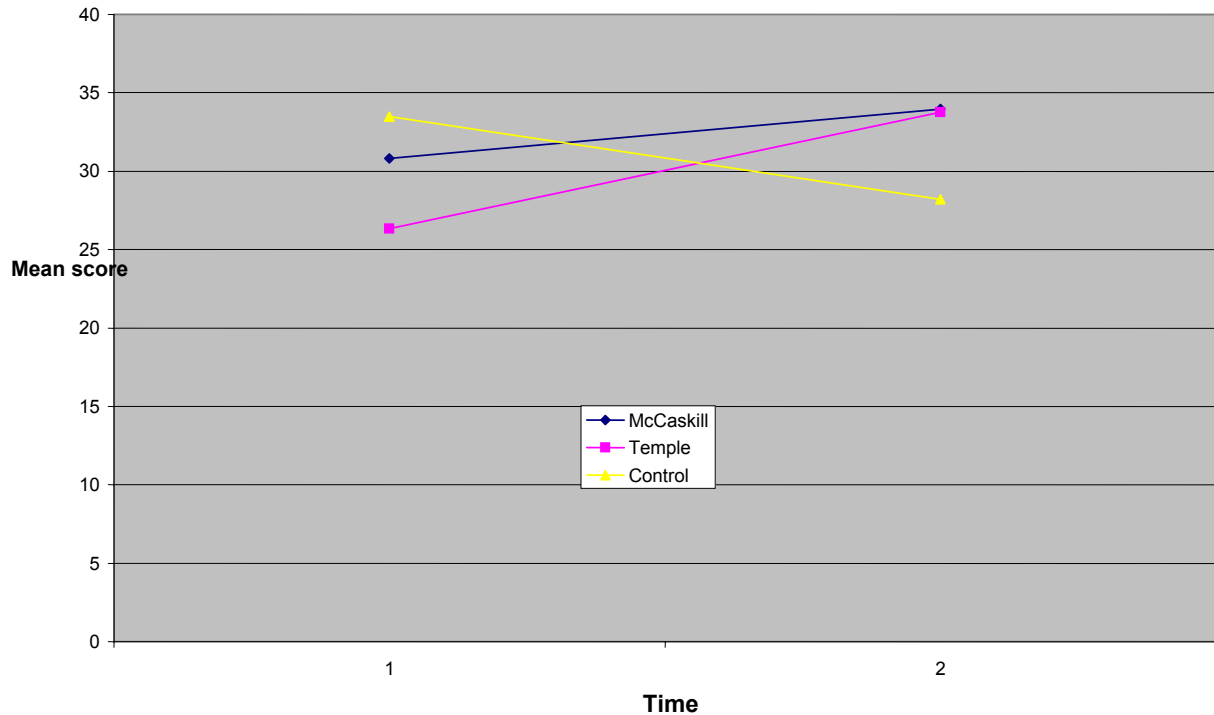
**Table One:** Group means and standard deviations for all teacher and parent assessment data across the three conditions for all those who completed assessments at both time one and time two

GROUP		Teachers		Parents	
		Time one mean (sd) and N	Time two mean (sd) and N	Time one mean(sd) and N	Time two mean(sd) and N
<b>Prosocial Behaviour</b>	<b>1</b>	30.82 (6.11) N = 31	33.97 (6.47) N = 31	30.41 (6.48) N = 20	30.95 (6.61) N = 20
	<b>2</b>	26.33 (8.23) N = 29	33.76 (5.58) N = 29	30.45 (5.31) N = 11	30.41 (5.54) N = 11
	<b>3</b>	33.48 (6.47) N = 29	28.22 (6.71) N = 29	28.32 (6.62) N = 11	27.55 (4.29) N = 11
<b>Rutter Prosocial behaviour</b>	<b>1</b>	29.73 (6.27) N = 27	33.87 (6.45) N = 27	16.51 (1.54) N = 20	15.86 (1.82) N = 20
	<b>2</b>	24.54 (8.96) N = 28	26.62 (7.81) N = 28	16.31 (1.98) N = 11	16.05 (1.16) N = 11
	<b>3</b>	33.97 (6.23) N = 26	26.76 (6.97) N = 26	15.96 (3.14) N = 11	15.51 (1.78) N = 11

**Rutter pro-social behaviour questionnaire:** An ANOVA was performed to compare the findings between groups across the two time periods. At time one the control group had significantly better social behaviour than Class 1 who had significantly better social behaviour than Class 2 ( $F(2,79)=10.8, p<0.001$ ). Results showed that there were no significant changes over time within the three groups ( $F(1, 78) = .08, p>0.05$ ), but a significant change between the groups occurred over time ( $F(2, 78) = 10.76, p<0.01$ ). Both the experimental groups showed a significant improvement in social behaviour. The control group showed a significant decrease in social behaviour. Please see Figure 2.



**Figure 1:** Changes in mean scores for Prosocial Behaviour Questionnaire (Teachers assessments)



**Findings from Parents Evaluation**

Table 1 shows means and standard deviations for all parent scores for parents who completed the assessments at both time points. As can be seen from the table, the two Game Factory groups contained children receiving higher prosocial behaviour scores than the control group at both time points

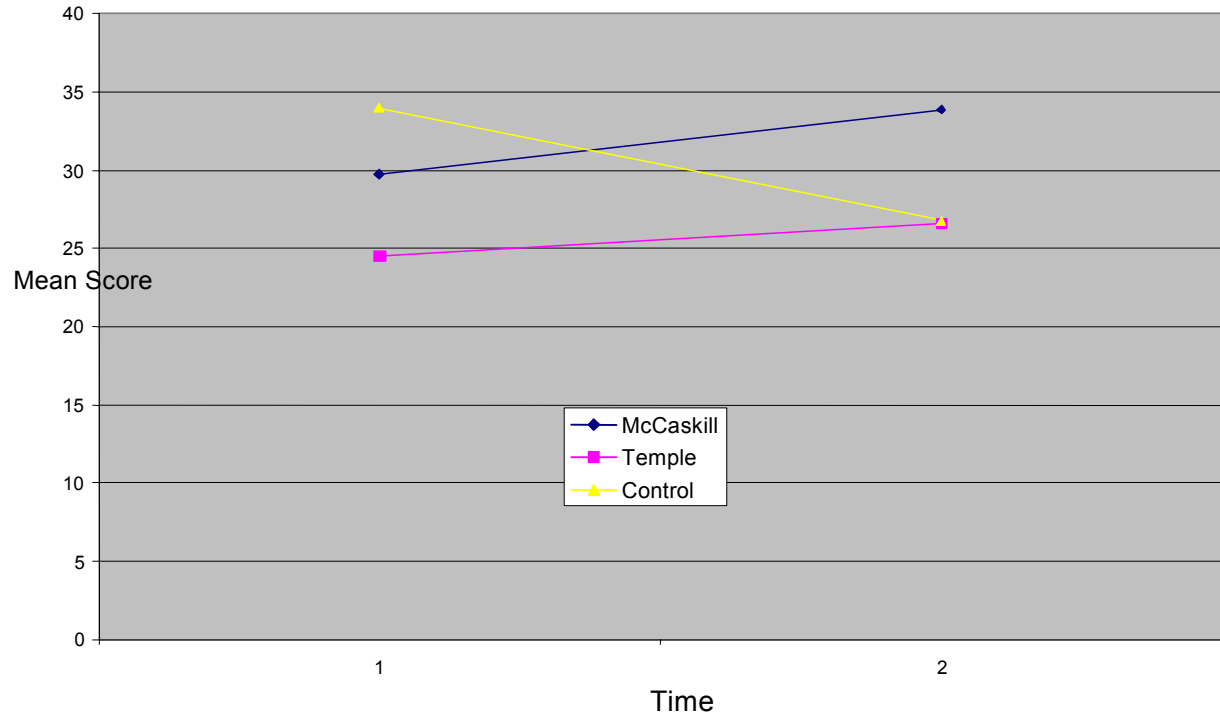
Parent’s completed assessments at both time points for 20/32 children in McCaskill's Class 1 group, 11/29 children in Temple’s Class 2 group and 11/29 children in the Class 3 control group.

***Pro-social Behavioural Questionnaire:***

An ANOVA was performed to compare the findings between groups across the two time periods for all those parents who completed both assessments (time one and time two). No significant differences were identified between groups at time one ( $F(2, 59) = 0.02, p > 0.05$ ). Results showed that there was no significant change over time for the three groups ( $F(1, 39) = 0.09, n.s.$ ) and also that there was no significant differences between the groups across time ( $F(2, 39) = 0.44, n.s.$ ). However, Class 1 showed improved pro-social behaviour in the family environment, Class 2 stayed relatively constant while the control group showed a decrease in pro-social behaviour over time. Please refer to Table One.

Due to the large number of parents who only participated at time one, an independent samples t-test was carried out to compare the time one prosocial behaviour scores between those who did not complete time two ( $N = 61, \text{mean} = 29.23, \text{SD} = 6.09$ ), and those who did complete time two ( $N = 41, \text{mean} = 29.94, \text{SD} = 6.09$ ). Interestingly, there was a significant difference between these two groups ( $t = 0.68, P < 0.05$ ), those who chose to continue with the study recorded significantly higher prosocial behaviour scores in their children than did those who dropped out.

**Figure 2:** Changes in Mean Scores for Rutter Prosocial Behaviour Items (Teachers Assessment)



***Rutter Pro-social Behaviour questionnaire:***

An ANOVA was performed to compare the findings between groups across the two time periods. No significant differences were identified between groups at time one ( $F(2, 59) = 0.14, p > 0.05$ ). Results showed that there was a significant change over time for the three groups ( $F(1, 39) = 4.67, p < 0.05$ ). T-tests showed that the control group became significantly worse in pro-social behaviour in the family environment ( $t = -2.24, p < 0.05$ ) while the experimental groups also got worse but not significantly (Class 1  $t = -1.73, p > 0.05$ , Class 2  $t = -0.54, p > 0.05$ ). No significant differences between the groups across time were identified ( $F(2, 39) = 0.21, p > 0.05$ ).

**DISCUSSION**

This study provides valuable support for the Game Factory program as a means of increasing prosocial behaviour amongst primary school children. Overall, the results suggest that the program can significantly improve pro-social behaviour at school. Although a significant home improvement was not identified, possibly due to low subject numbers, children participating in The Game Factory program did show more positive pro-social behaviour at home than did the control group (ie no worsening of behaviour). The major observed effect on pro-social behaviour is important in its implicit validation of current class-based, therapeutic approaches to behavioural modification. The finding that changes in pro-social behaviour were observed at home, although not significantly, highlights the need to follow this research with larger, more comprehensive assessments, to investigate the generalisation of this program.

A significant number of parents chose not to complete the second stage of the assessment, resulting in small final numbers of parent results for analyses. The remaining parents in the study had initially recorded significantly higher levels of prosocial behaviour in their children than had the parents who had left the study. This could possibly reflect the value that these parents had placed on prosocial behaviour in the home and family environment. If greater numbers of children exhibiting poor prosocial behaviour had been assessed at time two, significant changes in the parents assessments may have been identified. It is suggested that The Game Factory would have the most significant impact on children with the most challenging behaviours.

It was unexpected to find decreases in pro-social behaviour in the children participating in the control group. This could have occurred for a number of reasons. First, children in the control group may have felt excluded from the experiment. At best this suggests that the children perceive a benefit in the Game Factory program and consequently wish to participate. Alternatively, the desire to be in an experimental condition may have confounded results making any Game Factory benefit appear to be more marked than it really was. Second, there could have been other variables affecting pro-social behaviour during this time, for example, the end of summer or difficulties associated with the ongoing course of the semester. If this were the case, then it can be suggested that The Game Factory was helpful in combating external negative influences on pro-social behaviour. The difficulty in interpreting these unexpected findings further highlights the need to conduct more comprehensive research on this increasingly popular program.

Game Factory groups showed significant increases in pro-social behaviour and reduced increases in problematic behaviour at school. Although every effort was made to encourage teachers not to discuss their own findings with each other, it is acknowledged that this may well have occurred and impacted upon the results. However, the teachers at the school expressed some healthy scepticism of the program and so it is not believed that the significance of the results was artificially inflated. Further research with greater numbers of cases, longer durations of interventions and alternative means of assessment would be useful in clarifying the role of the program both at home and at school. These results support the development of programs such as this and indicate the need for greater research in these areas.

Another issue raised by the study was the impact of the facilitator on the success of the games program. The evaluation examined differences between two facilitators, one “ideal” facilitator (Class 1- McCaskill) and one trained teacher (Class 2- Temple). As expected, changes were more marked in Class 1 than Class 2 across all measures. However the fact that Class 2 showed significantly more behavioural improvements than did the control group indicates that the Game Factory’s benefits were not simply due to facilitator skills. The results suggest that the Game Factory can be beneficial for children when being facilitated by a teacher who has been through a facilitator workshop. It is noted from this study that facilitation can be carried out by a teacher and not necessarily a child behavioural specialist.

Despite steps to minimize confounding factors, there are several that could have occurred in this study. They include an experimenter expectancy effect as the teachers and some of the parents knew which groups were involved in the Game Factory program and which were not. Also, the children themselves were not questioned about their own perception of changes in their behaviour- only the parents and teachers who observed them. However it is important to acknowledge that it is the parents and teachers who have the most contact with the child and are therefore arguably the most appropriate assessors of their behaviour, other than the children themselves.

It is also important to note that due to a need for each facilitator to facilitate a whole year class, there were small age differences between the groups. Although it is not believed that this resulted in confounding results, it is necessary to be aware of class differences. Finally, the small number of parental responses is also worth noting. It is hoped that the encouraging results of this study will lead to further research encouraging greater parental support and co-operation.

The Game Factory teaches a group approach to social behavioural modification that follows the more recent trend towards principals of social learning and interventions that have superseded the teaching styles of the 1970’s reviewed by Goldstein and McGinnis (1997), and individual targeted approaches (e.g., Kazdin et al, 1989). This study is the first evaluation of this program in primary schools. The fact that significant results have been obtained from this relatively small evaluation promotes not only the use of this program but also further investigation into its mechanisms.

Examination of the assessment items suggests that children who have participated in regular Game Factory sessions are more willing to share games and toys. They are more likely to invite children outside of their close friends to join in a game and to be considerate of their feelings. They are more sympathetic and more compassionate in their dealings with others. These strong social relationships have been shown to be important for successful personal and social development of the individual (Battistich, Soloman, Watson, Soloman, & Schaps, 1989). This study supports the use of a cooperative physical games program, The Game Factory. The program, accessible to all children within a class, has been found to be a valuable tool for reducing and preventing behavioural problems and promoting pro-social behaviour in both the school setting.

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