

## Sex Differences in Activities in Early Childhood Centres<sup>1</sup>

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Interval observations of the percentage participation of boys, girls and teachers in preschool activities were carried out over 23 days in two kindergartens, two playcentres and two childcare centres. There was no significant difference in the participation of boys and girls in 12 out of 15 areas. The participation of boys was significantly greater than girls in the block area and with wheeled toys and less than girls in the family area. Teachers participated most in supervisory and kitchen activities, followed by collage, dough and painting. There was no significant difference between the low correlation (.1) between boys' and teachers' participation and the moderate correlation (.50) between girls' and teachers' participation. However teachers clearly spent more of their time in girl-preferred areas. The study suggests that breakdown of play stereotypes is occurring although some areas of difference remain.

The question of whether preschool girls and boys play differently in early childhood centres is an important one in the context of changing views of sex appropriate activities. Teacher and parent views of the extent of sex-typing in play and what children are actually doing are rarely congruent in the author's experience. Observations of play do allow us to examine the extent to which current views on the dangers of excessively rigid sex stereotyping (e.g. Bem, 1975; Huston-Stein, 1976; Meade, 1981) have been accepted by socializing agents and passed on to children.

A related issue to sex-typing in children's play is teacher activity. It has been argued that sex role stereotyping in adult behaviour is a powerful modelling influence on children's behaviour (Smith, 1980) yet there is little evidence available. Halliday and McNaughton's (1982) study suggests that girls are more likely to be found in areas where the teacher is also involved. It seems therefore important to examine whether teacher activities are sex-typed. Since the staff of early childhood centres are almost overwhelmingly female and may be expected to

act as models for the children, particularly the girls, the relationship between teachers' participation in activities and the participation of boys and girls could elucidate whether there is a modelling effect.

Sex differences in children's play behaviour have been observed as early as 13 to 14 months. Goldberg and Lewis (1969) found that 13 month old girls spent considerably longer playing with blocks, pegboards and with a stuffed dog and cat than boys, who spent more time with non-toys such as door knobs and light switches and in being active, for instance through banging toys. Fagot and Patterson (1969) observed three year olds in nursery classes and found that boys preferred climbing, playing with blocks, sand and transportation toys while girls preferred painting, playing with dolls and listening to stories. Smith and Daghli (1977) found that boys were more active in their play and spent more time with transportation toys and in forbidden toys (e.g. playing with wall plugs or climbing on furniture) while girls played more with soft toys and dolls.

By the time children reach preschool age, sex differences in play are well established. Connor and Serbin (1977) observed three and four year olds during free play in a nursery school for 12 weeks. Generally there was a high correlation (.54) between cultural norms as judged by undergraduate students and actual play behaviour in the nursery setting.

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Boys preferred to play with vehicles, blocks, balls, large motor toys and wheeled toys while girls preferred small motor activities like beads, sewing boards, crayons; family play with dolls; kitchen and telephone activities; music and painting.

Bell (1976) observed New Zealand boys and girls in 40 kindergartens and two playcentres on two fine mornings. Boys were found to use the climbing equipment, the sandpit, the carpentry table, blocks, and bikes and trolleys considerably more often than girls while girls predominated in the family corner, the dough table, painting, the music corner and in proximity to adults. Similar findings of fairly stable play preferences amongst preschool or early school age children with boys having more involvement in outdoor, active, physical or spatial activities and girls preferring indoor, social, family and expressive activities have been reported elsewhere in New Zealand studies (Halliday & McNaughton, 1982; Lott, 1978; Notes 1, 2). Kennedy's (Note 2) was a long term observation study carried out in a playcentre over about three weeks, and it showed little change between 1975 and 1979 in the pattern of sex-typing of play. Lott observed 72 children from two kindergartens for four fifteen-minute periods during free play over 19 days. Although her study showed some sex differences such as boys being more often involved with trolleys and in the sand pit and girls in painting, collage and puzzles, in the majority of play situations (12 out of 21) there was no difference between boys and girls.

Halliday and McNaughton (1982) also found considerable overlap in the play choices of boys and girls despite a greater tendency for boys to be in energetic outdoor activities and girls to be in quiet indoor activities. Boys were found to have departed from the stereotype to some extent. For example they spent considerable time in family play and with books.

The present study was designed to examine the participation by boys and girls in free choice activities in a variety of early childhood centres in Dunedin. The study also examined the participation of teachers in preschool activities. Thirdly the study examined the relationship between teachers' predom-

inant activities and the activities of girls and boys.

### Method

The study was carried out in two kindergartens, two playcentres and two childcare centres in Dunedin in November and December. One of the kindergartens was observed for nine mornings and the other one for six mornings. The longer observations were due to the study being used as a pilot for another intervention study. Each of the two playcentres and two childcare centres was observed for two mornings each. In all 23 mornings of observation were carried out. Requests were made to appropriate authorities for access to centres and they were chosen on the basis that staff did not object to being observed. The two child care centres were the only two full-day care centres operating in Dunedin at the time. In all centres the children came from a wide cross-section of socio-economic groups. Kindergarten and playcentre children were predominantly in the three to five year age range but the child care centres had a small number of two year olds. The actual numbers present varied from day to day—for kindergartens between 27 and 35, for playcentres between 14 and 25, and for child care centres between 19 and 26. There were generally three teachers (in the case of playcentres parent helpers are included under this term) present in all centres but one of the child care centres had four in the latter part of the morning. All teachers were female except one staff member in a child care centre.

### *Observation procedure and analysis*

For a total of 23 mornings interval-type observations were carried out for 1½ hours between 9.30 and 11 a.m. to determine which of 15 areas (see Table 1) boys and girls spent time, what proportion of boys and girls were in each activity, and which of these areas (and two additional ones—kitchen/storage and unidentified/supervisory) teachers spent time in.

The total number of boys and girls in the preschool was recorded at the beginning of each observation session. The observer used a device which signalled a ten-second observation period with a low frequency beep and then a five-second recording interval with a high frequency beep. The procedure was to observe in alternative intervals as follows:

1. In the first interval the code number of the area where the teacher was present during the observation interval was recorded. The teacher had to be in the area for at least six of the ten seconds to be recorded as in the area. There were usually three teachers present in

the pre-school and each one was observed for ten minutes at a time.

2. In the next interval the observer counted the number of boys and the number of girls actively participating in an area and recorded it. Areas were dealt with one at a time in the order listed in Table 1. If no children were in an area during the interval, the observer looked at the next area on the list.

For every day of the observation the number of boys and the number of girls in each area was tallied for each area observed and a mean calculated for each by dividing by the number of intervals when the area was observed. The mean was converted into a percentage using the following formula:

$$\text{percent of participation for boys (or girls) in an area} = \frac{\text{mean No. of boys (or girls)}}{\text{total No. of boys (or girls) present}} \times 100$$

The variables observed were:

1. (a) percent participation for boys in each of 15 areas; (b) percent participation for girls in each of 15 areas.

2. Percent participation for teachers in each of 15 areas plus participation in the kitchen or storage area, and a category called supervisory/unidentified which included moving from one area to another, standing aside from any area and observing various areas around the room and any other unidentified activity or area.

The overall means of participation for boys, girls and teachers were calculated by averaging over the 23 observations rather than averaging the means for kindergartens, playcentres and childcare centres. This was done in order to avoid giving undue weighting to the much smaller number of observations carried out in playcentres and child care centres.

Chi squares were calculated to compare participation of boys and girls in each area using the average of the boys' and girls' participation in each area as the expected value. No correction for continuity was used.

Rank order correlations between boys' and girls' participation in the 15 areas and teachers' participation in the areas was calculated.

#### Reliability

Four reliability checks were made about once every six days throughout the study. An independent observer recorded simultaneously (using earphones from the same signalling device) with the main observer for the one and a half hour observation. Reliability was calculated by the percentage of agreement method.

$$\text{Percentage agreement} = \frac{\text{No. of agreements}}{\text{No. of agreements} + \text{No. of disagreements}} \times 100$$

The percent agreement ranged from 93% to 97.6% with a mean of 95.9%.

#### Results

##### *Boys' and Girls' Participation in Play*

Table 1 shows the percent of participation of boys and girls in different activities. Overall the only activities across centres which showed a significantly different level of participation for boys and girls were the family area where girls participated more than boys; the block area where boys participated more than girls; and bikes and trolleys where boys participated more than girls. Kindergartens were the only type of preschool where construction toy play was observed (probably because of the much longer period of observation in kindergartens), and boys had a significantly higher level of participation in it than girls. Differences were in the direction of girls participating more in collage, dough, painting, puzzles, and moving gear while boys participated more in construction toys, the sandpit and carpentry. The three most preferred areas for boys were in order of preference: blocks, trolleys and bikes and climbing equipment; and for girls, the family area, climbing equipment and collage. The three least preferred areas for girls were construction toys, carpentry and blocks and for boys carpentry, music and water. In 12 out of 15 areas there were no significant differences between boys' and girls' participation. There was a low (nonsignificant) positive rank order correlation (.34) between boys' and girls' participation in the 15 areas.

There were some areas where the overall level of participation did not differ but where differences occurred among different types of preschool centre. Girls played with dough more than boys in child care centres but not in kindergartens or playcentres. Girls did more painting in playcentre but not in child care centres or kindergartens. (On the other hand, girls and boys at playcentres did not differ in participation in the family area or the block area, unlike the other centres.)

##### *Teacher participation*

Table 2 shows that the largest category

## SEX DIFFERENCES IN ACTIVITIES

77

Table 1  
Percent of participation of boys and girls in preschool activities†

	Kindergarten		Playcentre		Child care		Overall Means and S.D.'s			
	Boys	Girls	Boys	Girls	Boys	Girls	Boys		Girls	
	X	S	X	S	X	S	X	S	X	S
1. Collage	6.35	13.17	25.75	17.7	3.48	11.18*	9.22	13.18	13.61	10.72
2. Construction Toys (Mainly Lego)	7.27	1.47*					4.74	7.69	.96	1.97
3. Dough	2.77	8.69	20.0	16.63	5.13	20.88**	6.17	8.65	12.19	7.29
4. Painting	6.38	7.34	.63	8.25**	0	3.13	4.27	6.26	6.77	6.96
5. Puzzles	5.57	9.63	12.5	10.88	6.95	10.53	7.01	7.24	10.0	7.77
6. Family	4.65	13.61*	13.43	25.23	7.5	17.5*	6.67	8.73	16.30	10.05*
7. Music	3.99	6.94					2.60	5.49	4.53	13.07
8. Carpentry	1.62	.68	5.00	2.20	3.03	2.3	2.45	5.73	1.23	2.95
9. Blocks	17.70	2.87**	4.4	3.75	14.38	2.48**	14.80	18.37	2.96	4.51**
10. Sandpit	11.42	8.53	5.43	5.83	8.25	5.00	9.83	7.93	7.45	7.47
11. Climbing Equipment	12.79	14.51	14.58	7.38	18.13	18.13	12.37	11.83	13.9	11.99
12. Water	2.17	2.95			10.20	7.30	3.19	8.91	3.19	8.38
13. Trolleys and Bikes	20.26	6.06**			8.73	1.68*	14.73	14.04	4.24	6.06*
14. Moving gear - (slides, rockers)	4.87	7.45	4.05	8.23	6.60	13.35	5.03	6.33	8.61	7.19
15. Books	12.62	15.97	3.50	8.18	8.85	5.90	10.38	12.86	11.61	12.61

\*  $p < 0.05$ \*\*  $p < 0.01$ 

† Means have been calculated for different types of centre by equally weighting each day of observation at that type of centre, e.g. although nine days of observation were carried out in one kindergarten and six days at another, the kindergarten mean was calculated by dividing by 15.

for teacher participation overall was the general category of supervisory/ unidentified. Supervisory activities also prevailed in kindergartens and child care centres and were ranked second (after collage) in playcentres. Kitchen/storage participation was the second greatest overall but looking at different centre means shows that playcentre was very low on it. The greatest participation of teachers in preschool activities was in collage which was twice the frequency of the next favourite area, dough. Painting, books and blocks were other areas that teachers spent considerable time in. The least favoured activities by teachers were trolleys and bikes, the sandpit and water.

#### *Relationship between teacher and child activities*

The rank order correlation between boys' participation in the 15 areas and teachers' participation in the 15 areas was .10, indicating virtually no relationship. The rank order correlation between girls' participation in the 15 areas and teachers' participation was .50, a moderate positive correlation which is not statistically significant. There is no significant difference between these two correlations using Fisher's z-transformation.

#### Discussion

Generally speaking there is some degree of sex stereotyped play similar to that observed by Kennedy (Note 2) and Bell (1976). It should be noted, however, that as observed by Lott (1978) and by Halliday and McNaughton (1982), in the majority of areas there is no significant difference between boys' and girls' participation in different activities. Boys are still found to enjoy participating in active play, large muscle and spatial activities such as blocks, trolleys and bikes, and climbing equipment. One unusual finding in this study was the very low preference for carpentry in boys (as well as girls). It is possible that this is an activity which has not been encouraged or made readily available in Dunedin preschools. In one of the kindergartens observed there was no carpentry at all over the nine observations, because teachers had been unable to obtain appropriate wood. This would have had a depressing effect on the overall mean for carpentry.

Girls in this study still have a high preference for social, expressive and indoor, often passive activities such as family play, dough, collage and puzzles. One very interesting finding which contradicts the stereotype is that girls had a slightly (but nonsignificantly) higher use of the climbing equipment than boys and climbing is ranked second in girls' preferences and third in boys' preferences. This finding is in marked contrast to Bell's (1976) study where boys were more than twice as often on the climbing equipment than girls, but fits in well with Halliday and McNaughton's (1982) finding that climbing was girls' strongest preference. (Bell's data shows though that the climbing was ranked second for girls out of all the activities despite its much lower frequency than for boys.)

The finding that girls like climbing as much as boys may mean that the changing climate of opinion on sex role appropriate behaviour has had an effect on girls' behaviour perhaps through parent and teacher acceptance. If this is so, the finding is rather specific to one area of large muscle activity, since girls have little involvement in bikes and trolleys. It should be pointed out though, that most of the differences between boys' and girls' play are not statistically significant and that there is a moderate correlation between boys' and girls' preferences, which seems to indicate considerable overlap between boys' and girls' involvement in activities. Indeed it would be misleading to stress the differences between the sexes when there are so many similarities. Maccoby (1980, p. 273), makes the important point that even where there are differences in average scores there is a tremendous overlap in the behaviour of individual boys and girls.

One of the areas where boys still have a strong dominance is in play with bikes and trolleys. The author's informal observations of boys' play with wheeled toys lead her to believe that boys often combine their physical activities with wheeled toys with imaginative play of the "cops and robbers" and "cowboys and Indians" variety. In contrast, girls tend to confine their imaginative play to domestic, hospital and less adventurous roles in the family area. Hence the much greater participation of girls in the family area. It is a pity though that boys are so

Table 2

Percent of participation of teachers in preschool activities

Activity or Area	Kindergartens			Playcentres			Child Care			Overall Mean	
	A	B	$\bar{X}$	A	B	$\bar{X}$	A	B	$\bar{X}$	X	S.D.
1 Collage	11.97	7.91	9.94	37.5	7.90	26.55	19.10	1.25	10.18	12.47	16.38
2 Construction toys (Lego)	4.71	.96	2.84	0	0	0	0	0	0	2.10	4.31
3 Dough	2.96	5	3.98	3.55	17.1	10.33	2.5	20	11.25	6.21	7.55
4 Painting	10.18	1.95	6.07	0	4.3	2.15	.65	0	.33	5.04	6.27
5 Puzzles	2.7	6.51	4.61	5.4	10	7.70	.5	3	1.75	4.40	5.36
6 Family	2.42	1.96	2.19	5	7.1	6.05	0	1.5	.75	2.64	4.28
7 Music	.27	3.20	1.74	0	12.90	6.45	.85	0	.43	2.13	5.30
8 Carpentry	0	2.92	1.46	0	13.75	6.88	5	0	2.5	2.39	6.34
9 Blocks	6.53	.55	3.54	5	10	7.5	.85	4.4	2.63	4.46	6.55
10 Sandpit	.28	4.3	2.29	0	.85	.43	0	0	0	1.30	2.76
11 Climbing Equipment	1.65	4.28	2.97	0	0	0	5.35	2	3.68	2.40	3.67
12 Water	.27	.55	.41	1.25	0	.65	12	4.4	8.2	1.79	5.21
13 Trolleys and Bikes	0	2.38	1.19	0	0	0	0	0	0	.73	1.32
14 Moving Gear (e.g. slides and rockers)	.64	4.98	2.81	1.25	.85	2.1	3.35	1	2.18	2.73	4.28
15 Books	5.02	4.98	5.00	8.35	1.25	4.8	4.15	.25	2.2	4.48	5.81
16 Kitchen/Storage	11.67	6.52	9.10	1.25	.85	2.1	16.6	20.5	8.3	9.28	6.85
17 Unidentified/Supervisory	20.1	32.1	26.1	28.75	3.35	16.05	26.9	19	22.95	23.10	16.55

little involved in domestic roles and girls so little in more exciting roles. If there is to be social change in the direction of shared roles within the family and in the outside world, the beginnings of such sharing ought to be seen in boys' and girls' mutual involvement in dramatic play.

One of the strongest contrasts between boys and girls is in involvement with blocks with boys spending a great deal of time here and girls hardly any. In the author's view it is a real concern that girls have so little participation in an area which has so strong an influence on the development of spatial and mathematical skills, through activities such as matching, sorting and classification (Kamii & Devries, 1977, p. 397). Clearly girls will have as great a need for such skills as boys if they are to take an active role in the many different jobs which require mathematical and spatial skills.

Teacher participation in non-play activities was found to be high in this study. The large amount of supervisory and kitchen/storage activities is not surprising considering the responsibilities of most preschool teachers to keep an eye on the whole group of children, to prepare and clear up activities and morning teas and, in the case of child care centres, lunch. Caution should be exercised in concluding that large amounts of teacher time are spent by teachers without interacting with children since this study has not assessed teacher-child interactions. A previous study (Smith & Haggerty, 1979), showed that child care staff could and did successfully combine administrative and domestic activities with interacting with children.

The observations of teacher participation in play activities seem to confirm the prediction that teacher activities fit the female stereotype. (Unfortunately data for the one male teacher in a child care centre was not analysed separately but it is only about 5 per cent of the data.) There is a very marked involvement of teachers in all centres in the collage area. It was ranked first for all centres except child care centres where it came second. Collage was followed by dough, painting and books but these were at less than half the level of collage involvement. Probably the presence of teachers in these relatively

quiet, indoor activities is because of the possibilities they offer for talking to children. In addition they may be needed more in these areas as resources for ideas, for putting names on children's work and supervision of cleaning up. There is a marked absence of teachers from such areas as trolleys and bikes, the sandpit, water (except in child care centres) and construction toys. The low involvement of teachers with wheeled toy activities is not surprising since children are usually moving very fast or busily involved in imaginative play. The lack of involvement of girls in this more vigorous play should, however, be a concern if girls are to develop confidence and strength in their bodies and to participate in more varied imaginative roles. One could argue that teachers could use an area such as the sandpit to better effect for language interaction especially in relation to boys since this is an area which boys enjoy (Note 3). Most of the low teacher participation areas are outside. Although they kept a supervisory eye on the outside they were less often involved with children in activities here. Traditionally teachers, especially females, have preferred inside activities but perhaps they ought to recognise the potential of outdoor activities for cognitive, physical and social development.

The evidence for a greater relationship between girls' preferences and teacher activities than for boys is somewhat slender due to the lack of statistically significant differences between the correlations. The descriptive data though, suggest that some of the areas which girls enjoy most, particularly collage and dough, are those where the teachers too spend considerable time. Halliday and McNaughton's (1982) study shows a similar but stronger relationship between teachers and girls' activities. Whether or not this is due to a same-sex teacher modelling influence is arguable, although this is a possible explanation. It has been suggested that girls' somewhat great preference for teacher involved activities could be due to their greater enjoyment of proximity and verbal contact or their enjoyment of structured activities which provide feedback and modelling (Halliday and McNaughton, 1982). Without manipulating teacher behaviour it is difficult to determine casual relationships. In another

study (Note 4) it has been found that a teacher's presence in an area attracts both boys and girls to it.

The present study should provide some further systematic data about the play preferences of boys and girls and provide other researchers with useful comparative data. There is good reason to believe from this study and others that stereotypical play patterns are breaking down. Some stereotyping still remains and further research needs to clarify the factors which encourage both sexes to participate in all activities. Through participation in a variety of activities in the preschool years boys and girls will have a much fuller array of options when they reach adulthood.

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