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Social Facilitation of Young Children’s Dynamic Balance Performance

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Dynamic balance performance of young children (ages 4, 6, and 8) was assessed in three social situations: alone (only with tester present); coaction (one other child performing at the same time); and spectators (five other observer children present). Within each age and gender, children (N = 120) were classified as of higher or lower comparative skill. Each balance task performed (walking forward and backward on a line, a narrow beam or a wide beam) was classified as representing easier or more difficult tasks for each child individually. Findings (p < .05) indicated that the facilitation effects of social situations strengthened over age, with spectators producing increments in performance for children of higher skill (especially boys) and decrements in performance for the lower skilled children (both boys and girls). Coaction resulted in positive effects regardless of skill level.

As a research focus within psychology, sport psychology, and motor behavior, social facilitation effects have been a subject of inquiry since Triplett’s (1897) early work. Research efforts to clarify the nature of social facilitation were stimulated particularly in the late 1960s through the mid-1970s by Zajonc’s (1965) classic application of drive theory and his key hypothesis that the presence of others facilitates a learner/performer’s most available response. In an extensive review of the research of this period, Landers and McCullagh (1976) indicated that only portions of Zajonc’s postulates had been supported (e.g., performance increases with others present if the task is simple and the learning level of the performer is advanced); other portions yielded equivocal findings (e.g., whether the mere presence of others facilitates the response).

Perhaps in response to the apparent inability of previous research to explain social facilitation effects more concretely, recent scholarly efforts have focused upon offering...
alternative theoretical perspectives to the problem. Whereas Zajonc (1965) and most others had offered a drive theory view, more contemporary perspectives have included applying the Yerkes-Dodson (1908) inverted-U hypothesis (Martens, 1974), an attention narrowing/cue utilization perspective (Landers, 1980), self-attention and control (Carver & Scheier, 1981a, 1981b), attribution theory (Wankel, 1980), and the distraction/conflict hypothesis (Baron, Moore, & Sanders, 1978; Sanders, 1981). Such alternative approaches have acted as an aid to extend our understanding of social facilitation particularly in terms of potential processes that may underlie the phenomenon. Carver and Scheier (1981b, p. 557) have suggested, however, that such parallel metaphorical systems which attempt to explain behavioral direction and intensity may be only using quite different vocabularies to describe the same phenomenon, that is, the variety of theoretical perspectives may be compatible with each other.

The focus upon attention/environmental factors has yielded support for the importance of evaluation cues being present within the environment to produce social facilitation—at least for coaction (Landers, 1983). However, specific effects of coaction and audience situations remain largely unanswered. When the different social situations have been compared, equivocal findings may have been the result of a failure of a great majority of previous studies to account for the specific prior experiences that their subjects had had within each of the social situations contrasted. Situationally specific responses (Martens, 1975) acquired by each individual may have occluded the potential social facilitation effects from being demonstrated consistently.

Rather than to consider the effects of the presence of others as being based upon instinctual drives, as Zajonc (1965) had contended, Cottrell (1972) introduced a social learning perspective that may be more effective in explaining heretofore contradictory social situational findings. From Cottrell's view, with specific reference to experiences that represent evaluative or competitive/rivalrous situations, the socialization process begun in infancy promotes the acquisition of learned drives that function to affect the individual's response to the presence of others. Furthermore, other theorists (Bandura, 1977; Harter, 1978; Scanlan, 1973, 1978; Veroff, 1969; White, 1959, 1960) have taken a social learning perspective to explain their position on evaluation/competition experience by arguing that the reinforcements received in such situations shape the individual's orientation to evaluation and competition. One should take note, moreover, that responses to competitive situations appear to be well developed in North American children by the age of 12 (Alderman, 1974; McNally & Orlick, 1975; McPherson, 1978; Scanlan, 1978). For children as young as 5 years, social status appears to be related positively to motor performance levels (Steigelman, 1982); competitive behavior can be observed in most children at age 6 or 7 (Greenberg, 1932).

If responses to social situations are well formed by adolescence, examining social facilitation effects in young children may yield a more precise assessment of the relative general strengths of the various coaction and audience situations. However, as Scanlan (1978) contended, and Weiss and Bredemeier (1983) demonstrated, few researchers in sport psychology have taken a developmental approach. Previous social facilitation research efforts have primarily employed young adults (college age) as subjects; the phenomenon in relation to children has been studied with much less frequency. A number of early efforts (Hurlock, 1927; Leuba, 1933; Moede, 1914; Triplett, 1897) employed children as subjects, but these investigations concentrated upon the competitive coaction (rivalry) situation only.

More recent investigations (Chevrette, 1968; Clark & Fouts, 1973; Cox, 1966; Crabbe, 1971; Hollifield, 1982; Kiesler, 1966) have focused upon only the audience situation
and its effects upon children's performance. Chapman (1973) compared coaction and audience conditions, but laughter was the dependent measure. Apparently, only Wankel (1972) has attempted to examine the social facilitation effects, using the three basic situations of performing alone, with coactors, and before spectators, upon children's motor performance. Wankel's results indicated that only rivalry seemed to produce social facilitation effects. His findings also were interpreted as supporting Cottrell's (1972) social learning theory of social facilitation. However, since junior high school preadolescents were tested by Wankel, it remains unclear as to how social situations affect the motor performance of young children.

Therefore, it was the purpose of the present investigation to examine the effects of three social situations: alone, coaction, and audience upon the motor performance of young children. In addition, the child's skill level and the difficulty of the task (dynamic balance) were included to examine how these two variables interact with the situation in affecting task performance. This field study investigated "easier" and "more difficult" balance task performance of boys and girls ages 4, 6, and 8 who demonstrated comparative higher or lower developmental dynamic balance skill levels while they were alone (only a "teacher" present), together with one child of a similar skill level in a nonrivalry manner (coaction), and before a nonevaluative audience of other children (spectators).

Concerning a comparison of the three situations, the developmental perspective of competence and achievement motivation suggests potential differences in emergence and strength of each situation over the ages studied. According to White's (1960) view of development, competency starts at an autonomous or self-oriented stage and progresses to a social stage. Within the latter, comparison of one's performance to others begins to occur. It is likely that for most children, initial evaluation situations are of the audience type, that is, performing before others such as relatives and family members. It is likely that direct competition (rivalry) would occur with less frequency until the school years. Therefore, there may be an orderly progression wherein an audience (spectators) influences learning and performance at an earlier age, with coaction increasing in strength later.

Method

Girls and boys (N = 120) of 4, 6, and 8 years of age, representing a homogeneous, non-Title I, nondisadvantaged, working-class population, were randomly selected from volunteer classes from preschools and elementary schools (N = 5) in Summit County, Ohio. There were an equal number of: boys and girls (n = 60); 4-, 6-, and 8-year-olds (n = 40); and children of higher and lower comparative dynamic balance skill levels (n = 60). Random selection from the available sample (N = 235) incorporated gender, age, and skill level strata.

Balance Tasks

Dynamic balance skill was assessed by employing beam walking tasks from the DeOreo Fundamental Motor Skill Inventory (DeOreo, 1976), as well as line walking tasks.

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1As Geen (1983, p. 204) has recently concluded, assessing Zajonc's (1980) basic hypothesis with respect to performance decrements/increments and task difficulty is challenging: "Few studies any longer include task difficulty as a variable."
The line walking items were added as a result of a pilot investigation demonstrating that some 4-year-olds would not mount the beam, that is, they expressed great apprehension. The tasks administered used a 1-inch (2.5 cm) wide line taped to the floor and two balance beams of different widths, 3.9 inches (9.9 cm) and 1.8 inches (4.5 cm), raised 1 foot (30.5 cm) from the floor. On each beam or line, all of which were 12 feet (365.8 cm) long, two walking patterns were required: walking forward and walking backward. Thus, dynamic balance was assessed using six tasks.

The child was asked to step on the beginning of the line (or mount the beam) and attempt to walk the entire length without stepping off. If a step-off occurred, the child was instructed to step back on the line/beam at the point where she/he stepped off, and continue to walk to the end. Scores were determined in each situation for both product and process components of dynamic balance task performance. The product measures were (a) distance traveled in feet and inches (to the nearest 3 inches) until the first step-off the line/beam by the performer (DIST), and (b) the number of times the performer stepped off the line/beam (SO) until reaching the end point of the line/beam.

The process measures (like the product components) represented one judge's evaluation of the performer's movement pattern as the walk was accomplished in that situation. Four process factors of the walk were evaluated: speed, foot pattern, flailing of arms, and shifting of posture. All evaluations were made by judges (N = 24) who had previously demonstrated high inter- and intra-judge objectivity/reliability (r ≥ .90) after 1 month of intensive training. Each judge spent 40 hours studying/rating videotaped and actual dynamic balance performances of young children not involved in the study (see MacCracken, 1980). Each process factor was scored on a 3-point scale (0 = poor/minimal to 2 = good/maximal performance quality). The evaluation of the four process factors for a given walk (trial) were summed to yield a total score (TP), which in turn was used as the assessment of the child's quality of movement during the walk.

**Procedures**

All testing occurred at the child's own school. A pretest was administered to all children who, having received parental permission, consented to participate in the experiment. Each child's dynamic balance performance was assessed by one judge individually (alone) using all tasks. Since a pilot study had indicated DIST was the best discriminator of performance, to facilitate more efficient testing, only distance to the first step-off was recorded on the pretest. The DIST scores for each child on the six tasks were summed. Within each age and gender category, the 10 children with the highest scores were classified as of "higher skill" for their respective group, and the 10 with the lowest scores were designated as of "lower skill." Within each age/gender stratum the remaining children who were not classified as either of higher or lower skill were not assessed further during the study.

With the use of Latin Square procedures to control for order effects, all children were tested for their dynamic balance skill under three experimental situations. (Each child was tested by three separate judges, a different one in each situation.) The alone situation entailed having only the judge present during the performance. In the coaction situation,
two children of like age/skill performed at the same time on lines/beams that were side by side (6 feet or 182.9-cm apart). No attempt was made to induce or construct a competitive situation (i.e., rivalry). For the spectator condition, each child performed the tasks before five classmates who were seated in the testing area 6 feet (182.9 cm) from, and with a clear and unobstructed view of, the child performing. These five spectators were children identified on the pretest as neither low nor high in dynamic skill and thus were not subjects in the experiment. It should be noted that these spectators were considered observers but not evaluators; no record/judgments were requested from these observers regarding the subject’s performance, nor was the subject informed that these observers were evaluating them.

Each child performed two consecutive trials on each task (i.e., a total of 12 trials under each situation). Subjects were tested under each experimental situation, first on the simplest task (line walking), and then sequentially on each more complex task (walking backward on the 2-inch beam last). The earlier reported finding of high levels of apprehension by the 4-year-olds was the primary factor in choosing to follow a simplest-to-more-complex sequence (as stipulated by DeOreo, 1975). If a child were to begin with the narrow beam and walk backward, there appeared to be a greater chance of his or her withdrawing from the study. Of course this organization might have resulted in an order effect, but from the human subject perspective it seemed more important not to frighten the child.

**Design**

The basic design of the study represented a $2 \times 3 \times 2 \times 2 \times 3$ (gender x age x skill level x task difficulty x audience situation) factorial arrangement of the treatment conditions, with repeated measures on the last two factors. Task difficulty (easier or more difficult) for each child was determined for each of the six balance tasks after experimental testing. By the use of a MANOVA comparing the between-group variable differences on the performance measures, summed over the two trials at each situation, the standardized discriminant function coefficients indicated that the DIST and SO measures were the best discriminators of age and skill group differences ($p < .005$). Group membership prediction procedures yielded the following task difficulty categories.

Easier tasks were defined as task performance where DIST > 144 inches, with < 4 SO (over the two trials, maximum performance would be DIST = 228 inches, SO = O). More difficult tasks, for each child, were defined as those for which performance was: DIST < 144 inches and SO ≥ 4. For any task wherein performance varied such that DIST > 144 but SO ≥ 4, or DIST < 144 but SO < 4, the task was classified as of intermediate difficulty for the child. Performance also could be classified as too easy (i.e., DIST = 288, SO = O) or too difficult (the child refused to do the task). Task performances classified

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3The danger in using previously reported difficulty/complexity levels for an age group (e.g., DeOreo, 1975) should be apparent. Stipulating a given task as easier/simple or more difficult/complex for a given age group usually results in some children of a given age evidencing the reverse from the designated level of performance (e.g., task for the age group is considered easier, but a given child has great difficulty with the task). In addition, the possible order of task effect could be controlled.

4If the child evidenced great apprehension and/or refused to attempt the task, the task was completed using a modified movement pattern, that is, side-stepping; one foot on and one foot off the beam; walking on the beam with the tester holding the child’s hand. This ensured that each child experienced an equal number of trials for each task/situation.
as too easy, as intermediate, or as too difficult were eliminated as data that could be analyzed for that child.

Based upon the classification of task difficulty, 99 children demonstrated performance such that at least one of the six tasks could be classified as easier and at least one could be classified as more difficult. Only these children's data could be included in the analyses comparing task difficulty. In most cases, especially for the 4- and 6-year-olds, more than one of the six tasks satisfied the easier or more difficult classification for an individual child. In such instances, the mean DIST, SO, and TP scores of the tasks meeting a given task category were used.

Of the 21 children who did not exhibit both easier and more difficult task performance, four demonstrated performance that could be classified as representing only more difficult tasks (all were 4-year-olds, three of lower skill and one of higher skill). The rest of the children (n = 17) evidenced performance that could be classified only within the easier task category (4 6-year-olds, all of higher skill; 13 8-year-olds, 2 of lower skill and 11 of higher skill).

Given that 33% of the 8-year-olds did not demonstrate variability in task difficulty, two separate ANOVA procedures were conducted on the product (DIST and SO) and process (TP) scores. The original five-factor design was applied only to the 99 children having data in both task difficulty categories. A four-factor ANOVA with the task difficulty variable eliminated was used for the children (N = 116) demonstrating performance in the easier task category (4 6-year-olds, all of higher skill; 13 8-year-olds, 2 of lower skill and 11 of higher skill).

Results

With respect to the between-group variables (age, gender, and skill), ANOVA main and interactional effects should be classified as only descriptive for the sample studied, due to the task difficulty procedures employed. Similarly, comparisons between the easier and more difficult tasks reflect only the system used. Of more relevant interest are the effects of the audience situation variable, and most important, the interaction of the between-group and task difficulty variables with the audience situations.

Group and Task Differences

Presented in Table 1 are the descriptive data and ANOVA results for the main effects of the between-group and task difficulty variables. Again, the differences demonstrated represent only the results of the individual task difficulty classification and should not be interpreted beyond that context (e.g., to conclude from these data that females of these ages are, in general, better dynamic balancers than males would be incorrect). The large differences demonstrated between the two task difficulty categories simply confirm the success in separating the tasks into easier and more difficult for each individual child.

Situational Effects

For DIST scores, an overall effect of situation was obtained, $F(2, 87) = 3.28, p = .04$. However, interactions between age by situation, $F(2, 174) = 4.09; p = .0034$, and skill by situation, $F(2, 174) = 7.64; p = .0007$, indicated that the main effect of
### Table 1

Main Effects of Between-Group Variables (Age, Gender, Skill) and Task Difficulty for Distance (DIST), Step-offs (SO), and Total Process (TP) Measures (N = 99)*

<table>
<thead>
<tr>
<th>Variable level</th>
<th>DIST (Max = 288 in)</th>
<th>SO (#/Walks)</th>
<th>TPS (Max = 16)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>36</td>
<td>161.9</td>
<td>88.8</td>
</tr>
<tr>
<td>6</td>
<td>36</td>
<td>159.8</td>
<td>82.5</td>
</tr>
<tr>
<td>8</td>
<td>27</td>
<td>173.2</td>
<td>82.2</td>
</tr>
<tr>
<td>F (p)</td>
<td></td>
<td>3.62</td>
<td>(.0310)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>51</td>
<td>160.3</td>
<td>85.5</td>
</tr>
<tr>
<td>Girls</td>
<td>48</td>
<td>168.4</td>
<td>84.0</td>
</tr>
<tr>
<td>F (p)</td>
<td></td>
<td>3.88</td>
<td>(.0520)</td>
</tr>
<tr>
<td>Skill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>55</td>
<td>158.3</td>
<td>85.3</td>
</tr>
<tr>
<td>Higher</td>
<td>44</td>
<td>171.6</td>
<td>83.7</td>
</tr>
<tr>
<td>F (p)</td>
<td></td>
<td>10.32</td>
<td>(.0018)</td>
</tr>
<tr>
<td>Task</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Easier</td>
<td>99</td>
<td>236.2</td>
<td>42.6</td>
</tr>
<tr>
<td>More Diff.</td>
<td>99</td>
<td>92.2</td>
<td>46.8</td>
</tr>
<tr>
<td>F (p)</td>
<td>1781.74</td>
<td>(.0001)</td>
<td>736.31</td>
</tr>
</tbody>
</table>

*Scores = sum of two walks and then averaged over situations.

The situation was differentially related to these two between-group variables. Neither the analyses for SO nor TP yielded similar effects of situation (i.e., while descriptive values were usually in the same direction as the DIST scores, F ratios were weaker in strength).

**Age by Situation.** As age increased, the strength of the treatment effect of situations also increased (see Table 2, section A); that is, as evidenced by the F ratios from the analysis of simple effects, 4-year-olds demonstrated the weakest situation effect, followed by the 6-year-olds, with the 8-year-olds demonstrating the largest effects. Post hoc analysis indicated ($p < .05$) that, for the 6-year-olds, the coaction situation resulted in better performance (longer distance walked before the first-step off occurred) than the spectator situation. For 8-year-olds, coaction again resulted in a higher performance level than the alone condition. Thus, it appeared that as age increased, the positive effects of performing in the coaction situation also increased.

The additional ANOVA of easier task performance only ($N = 116$) also yielded an interactional effect between age and situation for both DIST, $F(4, 208) = 3.05; p = .0179$, and SO, $F(4, 208); p = .0097$. However, for easier task performance only, with the additional 17 children’s data added, the analysis of simple effects yielded different results (see Table 2, section B). Here, the strongest situation effect was observed for the 4-year-olds, with the spectator condition evidencing better performance ($p < .05$) than...
Table 2
Interactive Effects of Situation at Each Age for DIST Over All Tasks 
(N = 99) DIST and SO for Easier Tasks Only (N = 116)

<table>
<thead>
<tr>
<th>Age level</th>
<th>n</th>
<th>Measure</th>
<th>Alone</th>
<th>Coaction</th>
<th>Spectator</th>
<th>Situation</th>
<th>Simple effects</th>
<th>ANOVA</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Over all tasks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 4</td>
<td>36</td>
<td>M DIST</td>
<td>160.7</td>
<td>157.2</td>
<td>167.8</td>
<td>1.50</td>
<td>.2256</td>
<td></td>
</tr>
<tr>
<td>Age 6</td>
<td>36</td>
<td>M DIST</td>
<td>158.5</td>
<td>168.2</td>
<td>152.8</td>
<td>3.13</td>
<td>.0462</td>
<td></td>
</tr>
<tr>
<td>Age 8</td>
<td>27</td>
<td>M DIST</td>
<td>164.0</td>
<td>188.5</td>
<td>167.0</td>
<td>6.83</td>
<td>.0014</td>
<td></td>
</tr>
<tr>
<td>B. Easier tasks only</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age 4</td>
<td>36</td>
<td>M DIST</td>
<td>237.1</td>
<td>228.4</td>
<td>252.8</td>
<td>3.23</td>
<td>.0414</td>
<td></td>
</tr>
<tr>
<td>Age 6</td>
<td>40</td>
<td>M DIST</td>
<td>234.6</td>
<td>235.1</td>
<td>223.8</td>
<td>0.95</td>
<td>.3887</td>
<td></td>
</tr>
<tr>
<td>Age 8</td>
<td>40</td>
<td>M DIST</td>
<td>224.3</td>
<td>244.3</td>
<td>244.7</td>
<td>2.47</td>
<td>.0868</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M SO</td>
<td>1.5</td>
<td>1.2</td>
<td>1.5</td>
<td>0.89</td>
<td>.4107</td>
<td></td>
</tr>
</tbody>
</table>

a, bIndividual comparisons (Tukey HSD) between situations with each age reaching p < .05 are indicated by like letters.

the coaction situation for both DIST and SO; in addition, for SO only, the spectator condition resulted in better performance than the alone condition.

Of note with each age group is the direction of the differences for the easier task performance as compared to the overall task performance. While different social facilitation effects are apparent between the age groups, the differences between situations are in identical directions within each age group. For 8-year-olds, whether over all tasks or easier task performance only, coaction scores indicated higher performance than spectator scores, and spectator resultant performance was higher than alone. Thus, for 6- and 8-year-olds, performance on both easier and more difficult tasks was additive (in the same direction), resulting in the stronger demonstration of situation effects over all tasks. Such additivity helps explain why the interactional effects of age by task by situation were relatively weak, F(4, 174) = 1.32; p = .26. For the 4-year-olds on the more difficult tasks, while little differences between each situation was evidenced, the situation effects were opposite those for the easier task (e.g., M DIST alone = 84.3; M DIST coaction = 86.0; M DIST spectator = 82.9). Therefore, given the performance differences between the easier and more difficult tasks for the 4-year-olds, a cancelling effect occurred, resulting in the lack of a strong situation effect over all tasks for these youngest children.

Skill by Situation. The interactive effects for situation at each skill level have been presented descriptively in Figure 1. Analyses of simple effects indicated that situational effects were obtained for the lower skilled, F(2, 174) = 3.55; p = .03. For the lower skilled children, the spectator situation resulted in poorest performance, while coaction produced the best performance, with the distance traveled before the first step-off under
the alone condition between the other two situations. The post hoc test indicated that only the difference between coaction and spectator conditions satisfied conventional requirements (i.e., $p \leq .05$). For the higher skilled children, the spectator condition resulted in elevated performance as compared to the alone condition ($p < .05$). Coaction also evidenced a positive facilitation effect for the more highly skilled, but the effect was not as strong ($p > .05$).

The analysis of the easier-task-only DIST data yielded similar findings, with the situation effects at each skill level evident: for lower skill, $F(2, 208) = 3.61, p = .0249$; for higher skill, $F(2, 208) = 5.63, p = .0042$. Post hoc comparisons for the lower skilled yielded coaction (M DIST = 240.7 inches) better than ($p < .05$) spectator (M DIST = 220.3 inches), while neither social situation differed ($p > .05$) from the alone condition (M DIST = 233.4 inches). For the more highly skilled, spectator (M DIST = 253.1 inches) yielded performance that was greater ($p < .05$) than either coaction (M DIST = 232.0 inches) or alone (M DIST = 230.2 inches). Analysis of SO data yielded similar situational differences ($p < .05$) for each skill level: for lower skilled, the M SOs for each

Figure 1 — Situation effects at each skill level for distance to first step-off (in inches, summed over two trials) over all tasks (N = 99).
situation were coaction = 1.0, alone = 1.2, and spectator = 1.4; for the higher skilled, spectator = 0.9, coaction = 1.4, and alone = 1.5.

Thus, for these young children it appeared that only the spectator situation resulted in the “classic” (Zajonc, 1965) effect; that is, the spectator situation resulted in a performance increment for the higher skilled and a performance decrement for the lower skilled. On the other hand, compared to performing before spectators, coaction seemed to result in some positive facilitation for the lower skilled. However, regardless of skill level, coaction did not yield any great differences from the alone condition.

**Gender by Skill by Situation.** Throughout all analyses, gender evidenced minimal interactive effects with situation, with one exception. The interaction between gender, skill, and situation for DIST over all tasks was suggestive of a potential performance difference between boys and girls, $F(2, 174) = 2.97, p = .05$. Analysis of simple effects and subsequent post hoc comparisons yielded the following situational effects ($p < .05$) at each gender/skill level (see Figure 2). For boys of lower skill, performance before spectators
Table 3

Interactive Effects of Skill x Task x Situation for SO Scores

<table>
<thead>
<tr>
<th>Skill level</th>
<th>Easier tasks</th>
<th>More difficult tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Alone</td>
</tr>
<tr>
<td>Lower</td>
<td>55</td>
<td>1.21</td>
</tr>
<tr>
<td>Higher</td>
<td>44</td>
<td>1.59</td>
</tr>
</tbody>
</table>

a, b Individual comparisons (Tukey HSD) between situations for the skill groups within a specific task condition reaching $p < .05$ are indicated by like letters.

(M DIST = 144.3 inches) resulted in poorer performance than under coaction (M DIST = 161.0). For girls of lower skill, coaction (M DIST = 174.3) distance traveled was farther than either alone (M DIST = 156.8) or spectator (M DIST = 152.5). For higher skilled boys, the spectator situation (M DIST = 174.0) was superior to alone (M DIST = 153.2), while the difference for these children between alone and coaction (M DIST = 169.8) only approached the required difference at $p = .05$. No predictable differences were obtained for the girls of higher skill. Therefore, over all tasks the lower skilled children (both boys and girls) evidenced poorer performance before spectators than when coacting. The positive facilitation effects of spectators, for children of higher skill, were demonstrated only for the boys; while girls of higher skill performed best before spectators descriptively, the differences were not large enough to meet conventional levels of statistical significance.

Task by Situation. From a theoretical perspective, and based upon previous research findings, one would expect to evidence an interaction between task difficulty and situation. However, for DIST scores, little evidence of any interaction between task and situation was obtained, $F(2, 174) = 0.30, p = .7401$. While the analysis for TP scores also yielded little indication of such an effect, $F(2, 174) = 0.39, p = .6775$, the task by situation effect for SO, $F(2, 174) = 2.52, p = .0831$ did demonstrate a weak trend. Most important, the interaction of skill by task by situation indicated differential effects, $F(2, 174) = 3.74, p = .0258$. Table 3 indicates that for both skill levels performing easier tasks, as well as for the lower skilled performing more difficult tasks, the performance differences between situations match exactly the skill by situation findings previously presented. For the higher skilled children performing more difficult tasks, however, a different pattern emerged. Whereas the DIST analysis indicated better performance by the higher skilled at the spectator situation over all tasks, the SO data indicated poorer performance ($p < .05$) by the higher skilled when performing more difficult tasks before spectators than in either the alone or coaction conditions.

Discussion

Over all three ages studied, the effects upon performance by the social situation variable increased in strength. Thus, from a developmental perspective, the increasing
importance of others in affecting a child’s performance, as proposed by a number of social learning theorists (e.g., Veroff, 1969; White, 1960) appears to have been supported. However, with respect to the specific situations examined, differential effects were noted. Over all tasks, coaction resulted in performance increments for the older children (6- and 8-year-olds). For the younger children, a social facilitation effect was observed for only the spectator situation, and solely for easier task performance; the hypothesis that the spectator situation would result in an earlier appearance as a facilitation factor was supported.

The findings with respect to the interaction between the skill level of the child and social situation offer additional support for the earlier potence of spectators. Over all ages (at no time did age and skill interact together with situation), the skill level of the child influenced the direction of the social facilitation effects when performing before an audience. Whereas coaction maintained its position as a positive influence upon performance over both skill levels, the presence of spectators produced the classical theoretical prediction: the higher skilled children evidenced highest performance levels before the audience whereas the lower skilled evidenced performance decrements. If most children follow a similar progression, it would then be predicted that coaction would begin to produce similar interactive effects at a later age. Scanlan (1978, p. 135) has concluded from prior research that “there is an increase in comparative and competitive behavior with age throughout the elementary school period with the greatest intensity occurring around grades four, five and six”; it may be during this age period (9 to 12 years old) that coaction begins to generate the predicted effects.

As Weiss and Bredemeier (1983) noted, Harter’s (1978) model of competence motivation—an extension of White’s (1959, 1960) model—suggests potential developmental differences between genders due to different socializing influences. With respect to social facilitation, few studies have explored such potential gender differences (Murray, 1983). The present investigation evidenced a possible gender effect, in conjunction with skill and situation. Both boys and girls of lower skill demonstrated performance decrements in the spectator situation. Yet, for the higher skilled children, only the boys performed better before spectators. The higher skilled girls, however, descriptively evidenced highest performance before spectators. Given that the sample size of the higher skilled girls was reduced (10 higher skilled girls did not demonstrate more difficult task performance, including seven 8-year-olds), the lack of a demonstrated positive effect of spectators may be the result of lowered power.

Such a view seems further supported by the lack of a gender interaction when only the easier task data were analyzed (in which all higher skilled girls were included). Thus, no strong evidence for a gender difference was apparent; Murray (1983) found a similar lack of gender difference when comparing the alone versus audience conditions in college-age subjects. At this point, it appears that theoretically predicted social facilitation differences between males and females may not be strong.

In assessing the findings of the present study, one apparently contradictory result occurred: whereas spectators, for the higher skilled, produced a performance increment when DIST scores were analyzed, the SO analysis indicated a reverse effect (on the difficult tasks only). Geen’s (1983) perspective seems to offer one possible explanation of this finding, that is, that evaluation apprehension is a function of the performer’s anticipation of negative outcomes. When performing the difficult tasks, the higher skilled subjects may have initiated performance while expecting a positive outcome (i.e., reaching the end of the line/beam with few if any SOs). However, upon experiencing the initial and subsequent SOs, their expectation may have changed, from positive to negative.
If this were true, then one would expect that performance on the second trial would be inferior to the first. Indeed, the spectator condition means on the more difficult task indicated that the higher skilled children walked farther on the first trial than the second (M DIST = 57.7 and 46.6 inches, respectively), and slightly more SOs also occurred on the second trial (trial 1 = 4.4; trial 2 = 4.6). Thus, due to initial positive facilitation by spectators, on the first trial, overall DIST until the first SO was greater. After the first SO, there may have been a shift from positive to more negative outcome expectations, resulting in SOs both within the first trial as well as the second trial. Because a shift in expectations would not occur until after the first SO, the DIST traveled would be less affected, and especially on the first trial. The children may have revised their expectations downward only somewhat at the beginning of the second trial. After the initial SO on the second trial more negative expectations may have been reconfirmed, resulting in more SOs as with the first trial. However, without directly assessing expectations, such a shift hypothesis is largely speculative.

The apparent within-trials effect just discussed provided the only evidence of a task effect. With respect to all other situational effects, the skill levels of the children appeared to be the crucial variable. Whether the task was classified as easier or more difficult, for the individual child, the observed facilitation effects, especially for the lower skilled, were relatively constant. Thus future investigation, with children especially, should consider skill level as an important variable in assessing social facilitation effects and not limit the research design solely to a task difficulty variable. When examining task difficulty, efforts should be undertaken to ensure that the selected tasks are indeed more difficult for each child individually, that is, not employ a group classification of difficulty.

Related to task difficulty and skill level would appear to be the measures used to assess performance. Within the present investigation, both product and process aspects of performance were assessed. Whereas distance and step-off (product) measures yielded the most sensitive measures for the dynamic balance task used, the process measure (the quality of the walk) did not evidence situation effects. Correlation indicated that the relationship between the DIST and SO measures, within each situation, were high for the easier tasks (r's ranged from - .76 to - .83) and moderate for the difficult tasks (r's ranged from - .41 to - .65). Regardless of task, the correlations between the TP scores and each product measure, within each situation, were quite low (r's ranged from .10 to .37). In addition, the correlations between the TP scores over the three situations were higher (r's ranged from .37 to .61).

One might conclude, therefore, that the quality of performance was not affected by the situational variable. A developmental approach may explain this result. In the acquisition of skill, the child's attention initially may be directed at the product aspects (i.e., the more easily identified sources of feedback—how far she/he walked, how many times she/he stepped off), and then, as the skill is further refined, attention may be focused upon the movement quality. With greater practice or testing, process differences, as a result of situation, may become evident. Additionally, given that the instructions were oriented as well to the product aspects—"walk the length of the beam/line without stepping off"—the children may have been attending less to the quality (process) of their movement behaviors. Thus, future research efforts might manipulate instructions to foster attention by the child upon the quality of the movement performed by manipulating the bias of the performer (Kushnir & Duncan, 1978).

The present study was an attempt to begin a developmental approach to the study of social facilitation. The theoretical bases for the variables investigated represented a merging of classic social facilitation theory and the theoretical perspectives of competitive
behavior, competency, and achievement motivation development. As a beginning effort, using Wohlwill’s (1973) approach as a guide, the present study must be classified as largely descriptive (level 2, cf. Roberton, 1982). Whether the obtained findings were due to information processing factors such as attention or distraction, or drive and arousal changes, is unknown. Similarly, without employing a more cognitive approach, using attributional methodology, certain suggested explanations offered must be viewed with great skepticism. From a developmental perspective, such attempts at explaining social facilitation first demand a description of the phenomenon. As noted by Weiss and Bredemeier (1983), such a description has been virtually nonexistent.

With respect to studying the social facilitation phenomenon, of note is the relative contribution of the social situation variable to the overall variance. Landers, Snyder Bauer, and Feltz (1978) have indicated that such effects account for only small amounts of the total variance (1-3%). Indeed, even for the DIST measure, where the strongest effects were demonstrated, $\omega^2 = 1\%$ for the main and interactional effects of situation. For the easier task only ANOVA, $\omega^2$ increased to 6%. When the task variable was deleted as a source of variability in the first analysis, $\omega^2 = 8\%$ for situation effects. Thus, while the situation effects accounted for more variation than demonstrated previously with adults, even when task difficulty was deleted the effects remained relatively small.

If resultant adolescent and adult competitive behaviors and responses to social situations are a function of reinforcements received in prior experiences, then it is necessary to understand the development of social facilitation effects to such specific environments. Such an understanding (as identifying whether certain situations follow a developmental course, e.g., coaction as a more powerful situation later in the developmental process) would aid the examination of hypotheses concerning which theoretical perspective best explains the phenomenon of the effect of others upon performance. More crucial, if specific reinforcements are determinants of future behaviors, then assessing social situation effects in the “mature” performer without accounting for the effect of differential, individualistic past experiences in such situations may lead to confounded treatment effects. Accounting for previous experience also may yield a greater portion of variance accounted for by the social situation variable.

References


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