IMMEDIATE ELDER SIBLING AS A FACTOR IN TASK PERFORMANCE

DENNIS ANGELINI[1]

Institute for Community Development, Syracuse, N. Y.

The relationship of motivational arousal, task complexity, and performance level has been investigated quite frequently (e.g., 6, 7, 8). These studies report similarly that higher performance is associated in easy tasks with higher arousal, but on difficult tasks with lower arousal.

Regarding individual motivational arousal level, studies have shown that position in the family context is a factor. Schachter (3), concentrating on first borns, found among them higher levels of anxiety than among later borns, in the same situation, concluding from this that the first borns function on a higher arousal level.

Adler observed earlier regarding the second child that "there is always a child ahead of him, and he is stimulated to exert himself and catch up" (3, p. 379). He is "constantly under steam," and has a "race-course attitude" (1, p. 126), with the older sibling as his "pacemaker" (3, p. 379). Thus the second born would function on a higher arousal level.

But Schachter and Adler would contradict each other only if we were to take motivational arousal level as an absolute property, regardless of the objective or goal of the motivation. Schachter refers to a goal of security, that is, escaping from a situation of threat, while Adler refers in the above to a goal of task performance which entails approach to a situation of challenge. In this light Schachter might say, first borns have a higher arousal level toward safety and security (with which incidentally Adler might well agree), while Adler, talking about second borns, would state that they have a higher arousal level toward task performance.

These considerations suggested two hypotheses: (*a*) higher task performance will be found in people with a sibling "pacemaker," in accordance with the Adlerian view; (*b*) first born subjects will perform a simple task better than later borns when given ego-involving instructions, but the reverse will be true in a complex task.

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[1]For reprints write to author, Institute for Community Development, 110 Harvard Place, Syracuse, N. Y. 13210.

Regarding these hypotheses two elucidations are in place. First, while Adler singled out the second born as having a race-course attitude he also stated that other children may have "the style of life of a second child . . . if the situation is of a similar pattern" (3, p. 38). Secondly, birth-order effects among siblings are according to Adler "absent when the gap between their ages is great, and they are all the stronger the narrower that gap is" (2, p. 235). In line with this, Miller and Zimbardo (4) have recently established that younger siblings with an age span of five or more years between themselves and the immediate elder (large gap) responded more like first borns; while those with an interval of less than five years (narrow gap) responded more as expected from their ordinal position.

With these considerations in mind two groups of subjects were used in the present study. The first had an elder sibling with a gap of four years or less, the immediate-elder-sibling (IES) group. The second group had no elder sibling or one with an age gap of over four years; they formed the no-immediate-elder-sibling (NIES) group. It included only children, first borns, and later borns with an age gap of over four years to the next older sibling.

METHOD

Subjects

The *S*s were 96 male college students, 18-21 years old and unmarried, taking introductory psychology at Syracuse University. Their families did not exceed four siblings and their mothers had some college education. Twins were eliminated from the study. The *S*s were divided into two categories as described above, the IES group and the NIES group.

Experimental tasks

The tasks were simple and complex card sorting. On the simple task the *S* had four cue cards before him. One of these had a red heart on it, while the other three were blank. The *S* was presented with a deck of poker cards face down. He was to pick up and turn over one card at a time. If it had a spade on it, he was to place it below the cue card with the heart. All other cards were to be placed face down in the center of the desk. Each *S* sorted a deck of cards in this manner eight times. Before each sorting, or trial, the position of the heart and three blank cue cards was changed in a predetermined manner out of view of the *S*. Also, the deck of cards was mixed before each trial. Before the first trial the *S* was given practice until he could perform the task successfully for half the deck of cards. No information about the results was given after the trials.

In the complex task the four cue cards were all marked, each with one of the signs of the four suits. The *S*s were instructed to place hearts below the club, diamonds below the spade, clubs below the heart, and spades below the diamond cue card.

In both tasks *S*s were asked to work as fast and accurately as possible.

TABLE 1. MEAN PERFORMANCE TIME IN SECONDS FOR SIMPLE AND COMPLEX CARD SORTING WITH NEUTRAL AND EGO-INVOLVING INSTRUCTIONS FOR NIESs AND IESs, AND MEAN PERFORMANCE ERRORS FOR COMPLEX SORTING UNDER NEUTRAL AND EGO-INVOLVING INSTRUCTIONS FOR NIESs AND IESs, PER TRIAL (N = 12 PER CELL)

	Performance time								Performance errors			
	Simple task				Complex task				Complex task			
Instructions:	neutral		ego-involv.		neutral		ego-involv.		neutral		ego-involv.	
Sibling adjacency:	NIES	IES	NIES	IES	NIES	IES	NIES	IES	NIES	IES	NIES	IES
Trial												
1	68	65	65	61	148	134	125	112	0.8	2.1	1.4	2.4
2	68	63	63	60	133	122	120	103	0.9	0.8	0.5	2.4
3	66	61	60	58	135	117	111	100	1.6	0.8	1.3	0.4
4	65	63	62	57	123	112	109	96	0.3	1.3	0.7	0.5
5	64	62	60	56	118	111	108	95	0.8	0.5	0.4	0.4
6	62	61	61	57	122	114	104	96	0.3	0.6	0.3	1.2
7	64	61	60	56	117	105	101	91	0.4	0.7	0.3	0.5
8	63	60	61	57	113	104	99	93	0.1	0.3	0.4	0.3

Procedure

Half the *S*s in each group, the IES and the NIES, received ego-involving instructions. They were told that the task revealed perceptual motor skill which was related to intelligence, and that they would be ranked according to their score. The other half were told that merely tasks were being tested for use in a future study.

Performance was measured in terms of (*a*) time required in seconds, and (b) number of errors made.

At the end of the session *S*s were asked to report on three 6-point scales their level of motivation or arousal for the first two, middle four, and final two trials.

RESULTS

Performance Time

Table 1 shows that IESs performed faster than NIESs on all trials regardless of task complexity and type of instruction. IESs were about as fast without ego-involving instructions as NIESs were with such instructions.

An analysis of the time data of the three Between and one Within variables design (2x2x2x8) was made. The Between factors were task complexity, instructions, and sibling adjacency; and the repeated measure was trials.

Table 2 presents a summary. It shows that task complexity, instructions, and sibling adjacency, each had a significant effect ($p < .01$) on performance time, the simple task, ego-involving instructions, and having an immediate elder sibling, making for faster performance.

The task complexity x instruction interaction was significant ($p < .05$), with instructions having a greater effect on the complex task, perhaps due to the ceiling effect in the simple task.

TABLE 2. SUMMARY OF ANALYSIS OF VARIANCE OF LENGTH OF TIME TO SORT DECK OF CARDS (N = 12 PER CELL)

Source	df	MS	F
Task complexity (TC)	1	492987.7	414.4**
Instruction (I)	1	19571.9	16.4**
TC x I	1	7647.9	6.4*
Sibling adjacency (SA)	1	10239.9	8.6**
TC x SA	1	3107.9	2.6
I x SA	1	8.0	.007
TC x I x SA	1	12.0	.01
Error	88	1189.5	

*$p < .05$; **$p < .01$.

The trials effect was significant ($p < .01$), as expected, speed increasing with trials. The trial x task complexity interaction was also significant ($p < .01$), with greater improvement in the complex task. Again, this may be due to the ceiling effect in the simple task. Trials effect is not included in Table 2.

Performance Errors

Performance errors are reported only for the complex task; in the simple task there were too few errors for any analysis.

Table 1 also shows the mean number of errors made by IESs and NIESs on the complex task with neutral and ego-involving instructions over the eight trials, the IESs making initially more errors but reducing them to the level of the NIESs almost immediately. An analysis of variance of the error data showed that there were no effects from sibling adjacency nor from instruction. But there was a significant trials effect with errors diminishing over the trials ($p < .01$) and the trials x sibling adjacency interaction (p. < 01) previously mentioned.

Self-Report of Stress

Analysis of variance for reported stress level showed no effects from instruction and slight effects from task complexity and sibling adjacency ($p < .10$ each), with higher stress in the complex task and by the IESs. The trials effect was significant ($p < .01$), with lower stress in the later trials.

DISCUSSION

An analysis of the results indicates that males who have an immediate elder sibling (IESs), (*a*) sorted cards faster than males with no immediate elder sibling (NIESs), in both simple and complex tasks, with neutral as well as ego-involving instructions; (*b*) made more errors during the initial trials of complex tasks than NIESs; and (*c*) tended to report higher arousal levels than NIESs.

These results support the Adlerian hypothesis regarding the higher performance level of the second born in a somewhat extended way in that all *S*s with an immediate elder sibling were compared with *S*s without such a sibling.

Failure to support the second hypothesis, namely, that NIESs will outperform IESs in a simple task but not in a complex task with ego-involving instructions, may be due to the fact that the instructions

did not have a greater arousal effect on NIESs as was expected from the previous research reports. IESs also tended to report initially higher stress levels.

Higher arousal, as reported by the IESs, appears to be associated with improved performance in simple and complex tasks as far as speed is concerned. But it appears to be associated with a temporary deleterious effect on accuracy of performance in a complex task. However, this disadvantage of the IESs decreased over trials.

The initial greater performance inaccuracy of the IESs may have serious consequences for them in other situations, such as a classroom, which may override their advantage in performance time.

SUMMARY

This study examined differences in task performance among males, as a function of task instructions, task complexity and the presence or absence of an immediate elder sibling in the family. The task was simple or complex card sorting. The instructions were neutral or ego-involving. The main finding was: *S*s with an immediate elder siblings (IESs) sorted the cards faster than those without such a sibling (NIESs), in both experimental conditions. But in complex card sorting the IESs initially made more errors than the NIEs.

The results on speed of card sorting support the Adlerian hypothesis that elder siblings act as a pacemaker for second borns who might develop an attitude of catching up with their elder sibling. This might then induce the faster work habit observed in this study.

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