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Thought Content and Gap Time in Basketball[1]

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Every coach and experienced athlete knows the importance of maintaining "concentration" for good performance, and every coach and athlete knows that performance tends to be uneven. Both within games and within seasons, players and teams go into slumps and, with any luck, come out of them again.

There is no firm a priori basis for believing that concentration (in the sense of excluding nontask ideation, as operationally defined below) has something to do with slumps, although that seems likely on both empirical and theoretical grounds. However, neither the phenomenon of concentration nor that of the slump seems to have received much attention from researchers in physical education or in psychology. Two popular textbooks (Tutko & Richards, 1971; Cratty, 1973) reveal nothing relevant to either phenomenon, and their indexes lack references to attention, concentration, thought, or slump. *Psychological Abstracts* and the ERIC files since the mid-1960s list only one reference to a controlled study of concentration in sports (Sheedy, 1971). Other work (Mahoney, 1979; Nideffer, 1976) has indicated that individual differences in attentional style are related to a person's typical athletic performance.

Work in the area of test anxiety, however, suggests an approach to the problem of slumps. A number of investigators have reported evidence that one important way in which anxiety erodes test performance is by giving rise to thoughts that are irrelevant to actually answering the questions (e.g., Meichenbaum, 1977; Sarason, 1973; Wine, 1971). These investigators did not systematically sample thoughts.

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Thought-sampling methods have, however, recently come into use in other research areas. Subjects in both laboratory and natural settings learn systematic ways of reporting their thoughts and are then signaled intermittently to stop everything and report on the last thoughts they had just before the signal (Klinger, 1978).

In an application of thought sampling to test anxiety (Klinger, Note 1), college students gave an average of three to four thought reports during the course of an essay examination. They also completed two posttest state anxiety measures. The results demonstrated an association among poor concentration, poor performance, and anxiety, and they suggested that the method may be a fruitful one to apply to sports.

Accordingly, we hypothesized that the thought content of team members would be more closely focused on play during intervals when their team was performing well than when it was performing poorly.

METHOD

Subjects

The members of a small-college basketball team consented to receive instruction in thought sampling and to participate in thought sampling intermittently during their games. Altogether, 14 players provided usable thought reports and affect self-ratings at one or another time over four varsity games, two of which the team won and two of which they lost.

Procedure

Since it was not feasible to interrupt players during play, team members were sampled in two other ways. First, players were instructed to regard each signal to come out of a game for a substitution as a signal to recall their last thoughts before that signal. As soon as they reached the sidelines, they narrated their last thoughts and rated their moods into a cassette tape recorder. Second, team members sitting on the bench, many of whom stood a good chance of being called into the game at any time, were signaled intermittently in random order at quasi-random intervals by a tap on the shoulder from an experimental assistant, and then they too narrated thoughts and rated their moods (the Wessman & Ricks, 1966, Calmness-Anxiety and Elation-Depression scales) into the tape recorder. The microphone for the tape recorder was placed inside a styrofoam cup, which players pressed to their faces to reduce the ambient noise level around

the microphone. Players were thought-sampled an average of once or twice per game, yielding a total of 90 analyzable thought reports. Of these, 13 were on substitutions and the other 77 while sitting on the bench. An experimental assistant marked the clock time at which the thought report took place and the number of the player. Team officials kept time and player records of points scored and attempted, rebounds, assists, and personal fouls.

Scoring

The thought reports were classified into one of five categories of content, depending on how closely the thought was focused on actual play (see Table I, footnote *a*). The thoughts were coded blind for the events of the games. Disregarding thoughts that one or the other rater found unratable due to noise or incomplete reports, two raters achieved 78% agreement on classification into the five thought-content categories (against a chance agreement level of 27%, $p < .001$), 90% in distinguishing Category

Table I. Thought Content and Team Performance: Frequencies of Thoughts

	Gap times		Hot times		Other		Total	
Thought content category[a]	*f*	%	*f*	%	*f*	%	*f*	%
1. Completely unrelated	0	0%	0	0%	2	3%	2	2%
2. Irrelevent to good play	1	8	2	13	11	17	14	16
3. Difficulty/ability	2	17	4	27	12	19	18	20
4. Self-exhortation/evaluation	6	50	0	0	13	21	19	21
5. Problem-solving/perceptual	0	0	8	53	16	25	24	27
– Unratable	3	25	1	7	9	14	13	14
Total	12	100%	15	100%	63	99%	90	100%

[a]Categories of thought used are detailed as follows: 1. Thoughts about things completely unrelated to playing the game, including thoughts about the beeping procedure, distractions in the playing area, mind-wandering, nonplay associations to the activity, etc. 2. Thoughts related to play but focused on aspects irrelevant to doing a good job (thinking about when *S* will get into the game, reasons for wanting to win, consequences of losing, regrets about previous actions, wanting the game to be over, etc.). 3. Thoughts related to the game but focused on the easiness or difficulty of winning it or on the *S*'s ability or inability to play well enough (including reasons for not playing up to par, self-accusations, wishes to do better, anger or joy over something that happened in the game, questioning referees' decisions, evaluating another player's play). 4. Self-exhortations and evaluations or critiques of *S*'s own present play or that of *S*'s whole team (including trying to whip up own or teammates' motivation). 5. Problem-solving thoughts about play or pure perceptual focusing on play (including thinking about strategy for present or future actions, describing play, harassing opponents, describing own moves during play, preparing self to play).

5 thoughts from all other categories (against a chance level of 55%, $p < .001$), and 84% on ratability (against a chance level of 71%, $p < .01$).

Games were divided into three kinds of periods: gap time, hot time, and other. Gap time was defined as any period during which the opposing team scored two or more consecutive field goals. Hot time was defined as a corresponding time when the team being observed scored two or more consecutive field goals. The rest of the time was defined as "other." In our conceptual scheme, gap time corresponds to a minislump within a game and hot time corresponds to its opposite. For our purposes, the crucial comparisons were of the proportion of thoughts in Category 5 (devoted to actual play, either by problem solving or pure perceptual activity) between gap time and hot time. Because of the small number of thought reports per player per game, these analyses aggregate the thought reports of different players. In effect, these analyses ignore individual differences and treat the team as a unitary organism.

RESULTS

The distribution of thoughts into different categories is shown in Table I. Overall, only about a quarter of the thoughts (27%) clearly fell into Category 5 and about a fifth into each of Categories 2 to 4. Only 2% of thoughts were completely unrelated to play, but 58% fell into categories that did not include solving problems of play or perceptually focusing on play. The distribtion of the 13 thoughts of players coming out on substitution is not greatly different from those contributed by players on the bench.

The distributions of thoughts during gap time and hot time were markedly different. The proportion of thoughts in Category 5 was significantly higher during hot time than during gap time, when none occurred (Table II). There was also a marked concentration of gap time thoughts in Category 4, but since this had not been predicted it was not tested for significance. The distribution of thoughts during "other" times tended to be intermediate between gap and hot time distributions except for Categories 1 and 2, where the proportions were somewhat higher.

No other relationships reached statistial significance. There were nonsignificant trends toward more elation and agitation during hot time and more depression and calm during gap time. There were no consistent relationships between a player's thought content and scoring totals. Neither the thought nor the affect distributions appeared to differ systematically between games or halves won and games or halves lost.

Table II. Gap Time, Hot Time, and Thought Content Frequencies[a]

	Thought categories[b]		
Team performance	1-3	4	5
Gap time	3	6	0
Hot time	5	0	8

[a]When Category 5 thought frequencies are tested against all others, the Fisher Exact Test yields $p < .01$. Of the two thoughts by players coming out of the game during gap time, one fell in Category 4 and the other was unratable. The significance level is unchanged without these two thoughts.
[b]See Table I for definitions.

DISCUSSION

This study was conducted to demonstrate the interdependence of thought content and team performance, and to demonstrate methods for studying these phenomena in sports. The methods and results provided these two demonstrations but are limited by the small number of observations collected, observation of only a single team, and observations predominantly of players on the bench. A far more desirable design would set up competitive play under conditions in which players can be interrupted in the middle of play. That is not, of course, feasible in formal intercollegiate competition.

The results suggest a model for explaining minislumps and perhaps even longer-term slumps. Thoughts during gap time, as compared to hot time, switched from concentration on the process of playing to either reflecting on how well or badly the player or the team was doing or exhorting oneself to do better. This suggests that something in the game—perhaps a slight reverse or strong challenge—distracts attention from the flow of concentrated play and focuses it instead on a self-conscious interaction with oneself; this may then impede play further, thus producing a vicious circle that constitutes the slump.

REFERENCE NOTE

1. Klinger, E. *Thought content, anxiety, and essay test performance.* Unpublished manuscript.

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