

EXPLANATORY STYLE AMONG ELITE ICE HOCKEY ATHLETES¹

HENRY DAVIS IV

AND

LEONARD ZAICHKOWSKY

Calgary, Canada

Boston University

Summary.—'Mentally tough' athletes show resilience and an ability to compete during adverse conditions. The present study investigated mental toughness and assessed causal explanations for positive and negative reactions to imagined events using Seligman's Attributional Style Questionnaire. Pessimistic Explanatory style on this scale is a risk factor for negative affect and behavior following negative events. 38 elite athletes in ice hockey were rated for mental toughness by the National Hockey League's scouts on consensually derived criteria. The comparison of players above and below the median split on mental toughness showed composite explanations for negative events that were more internal, stable and global for players above the median. Contrary to predictions, these results suggest that a Pessimistic Explanatory style may benefit hockey performance.

Certain emotional and cognitive responses of an athlete to disappointing competitive outcomes may serve as risk factors for decreases in training and future performance. Davis and Pargman (1990) surveyed the range, intensity, and duration of emotional reactions to disappointing competitive outcomes using survey data and the Profile of Mood States. Their results showed significant increases in scores for Depression, Anger, and Confusion following losses, with durations of roughly 4.5 days for strong negative affect.

In a professional ice hockey season of 80 games the number of days between games rarely exceeds two days over a 6-mo. regular season. Loss of a game is a stress which imposes disequilibrium and forces a period of readjustment or adaptation. Some athletes may require more than two days to resolve negative affect following a loss. In research on loss and life stress, numerous studies have illustrated impairments in coping as the outcomes of negative inferences about negative experiences (see Kessler, Price, & Wortman, 1985). In this literature the loss is described as a stressor that can undermine self-esteem and reduce a person's ability to meet daily life demands. Faulty inferences about loss and stress in sport can have similar consequences (Davis & Pargman, 1990).

Some individuals, however, appear resistant to the negative effects of loss and stress; a brief recovery period may be adequate for them. Research on resistance to recurrent stress has given rise to various constructs. Work by Kessler, Price, and Wortman (1985), Peterson and Seligman (1984), and

¹Please address correspondence to H. Davis, Ph.D., Suite 354, 401-9th Avenue SW, Calgary, Alberta, Canada T2P 3C5.

Seligman (1990) implies that explanations can be a factor in resistance to depression following negative life events.

Seligman's model predicts that individuals who invoke internal, stable, and global causes to understand negative life events are at risk for depression when such events occur (Seligman, Castellon, Cacciola, Schulman, Luborsky, Ollove, & Downing, 1988). This so-called Pessimistic Explanatory style can be considered a risk factor (not a cause) for depression by contributing to the expectation that outcomes will not be controllable. Earlier studies showed that this style is correlated significantly with severity of depression (Peterson & Seligman, 1984) and with illness (Peterson, 1988). Moderate correlations between this style at termination of treatment for depression and one-year follow-up suggest that explanatory style is trait-like and resistant to change.

Explanatory style, using Seligman's model, has received minimal attention in sport. Seligman, Nolen-Hoeksema, Thornton, and Thornton (1990) conducted a study on two university-level swim teams. Swimmers who demonstrated a Pessimistic Explanatory style defined by scores on the Attributional Style Questionnaire swam slower in competition than swimmers who were classified as having an Optimistic Explanatory style. In the second part of the study, the researchers gave swimmers false negative times. In their next swim performance deteriorated for those swimmers with a Pessimistic Explanatory style.

In sport, mental toughness is the term which is often used to describe the resistance to negative affect during adversity in a game or after loss of a game. Mentally tough athletes show minimal performance decrements following adversity. The present research was a study of mental toughness among ice hockey athletes in which causal explanations for hypothetical but realistic events were assessed to judge whether those players classified as showing mental toughness in their on-ice behavior are different from those rated as having less mental toughness. Mentally tough athletes whose on-ice behavior suggests a resistance to negative affect during adversity were predicted to have an Optimistic Explanatory style with respect to causal inferences about negative events.

METHOD

Subjects

The sample of 38 players had a minimum age of 17.8 yr. and were (a) eligible for the National Hockey League entry draft in the year tested, were identified by the team's scouting program as a potential choice for the first three rounds, and were identified by team management for an interview in the scouting program or (b) in their first season on an International Hockey League Team.

Inventories

Attributional Style Questionnaire.—Explanatory style was measured using a modification specific to hockey of the Attributional Style Questionnaire (Peterson & Seligman, 1984). This self-report questionnaire yields scores for Explanatory style for positive and negative events along causal dimensions of Stable versus Unstable, Global versus Specific, Internal versus External. Subjects were asked to make causal attributions for 12 hypothetical but realistic events—six positive and six negative—each category having three achievement and three affiliation themes. Causes are written down before the subject rates each cause on a 7-point summated scale for Internality, Stability, and Globality (Peterson & Seligman, 1984). Each of the 12 events, therefore, has three ratings with a possible score of 3–21. The achievement themes were reworded to be relevant to sports. For example, the item worded, “You try for a position that you want very badly, e.g., college admission, etc., and you get it,” was reworded as follows: “You try for a position that you want very badly, e.g., starting line for important games, and you get the assignment.”

Ratings were summed across the three dimensions to derive composite scores, e.g., a composite positive plus a composite negative score. Higher scoring is in the direction of Internality, Stability, and Globality. The unit for analysis also used in research on the Attribution Style Questionnaire is the difference between these positive and negative composite scores. This difference incorporates both the achievement and the affiliation content. Similarly, subscores for Composite Hopefulness, Composite Achievement, Hopefulness Achievement, Composite Affiliation, and Affiliation Hopefulness were derived using methods described by Peterson and Seligman (1984). Reported interitem consistency of these composites has been estimated to be in the range of .75 (Cronbach alpha) (Peterson & Seligman, 1984).

Mental toughness ratings.—There were a maximum possible of eight ratings per player. Each of five scouts, the general manager, the coach, and two assistants rated Mental Toughness. Due to geographic constraints on the scouting program, it was not possible for each evaluator to rate each player; however, each player had a minimum of two ratings. The average number of ratings per player was 5.4 ($SD = 2.7$). The criteria for ratings were developed in consultations between the authors and the raters. There were four criterion on-ice behaviors, consensually defined to reflect mental toughness, as follows:

1. *Adversity response.* Appears to respond to challenge, failure, and set back with increased work and competitiveness.
2. *Over-achievement.* Exceeds usual performance while under stress.
3. *Effort.* Plays with consistency and effort at the level of his ability.

4. *Enthusiasm*. Appears enthusiastic and generates enthusiasm among teammates.

5. *Skill*. A subjective assessment of demonstrated ability.

The athlete's Mental Toughness ratings were summed, then divided by an over-all skill rating to yield adjusted scores. Adjusted ratings were significantly correlated ($ps < .01$) and ranged between .64 and .92. A median split of 1.01 was used to form two groups who scored high and low on Mental Toughness.

RESULTS

The data show that players who were rated higher on Mental Toughness had significantly more Pessimistic Explanatory styles than their lower rated counterparts. The Over-all Composite difference score shows this significant difference ($F_{1,36} = 3.91, p = .05$). The subgroup of 18 questions related to achievement best accounts for this difference, again showing greater pessimism in the group with higher rated mental toughness ($F_{1,36} = 7.77, p = .008$). The Composite Achievement score shows smaller difference for the high Mental Toughness group than for the low one (High $M = 1.9, SD = .9$ vs Low $M = 1.2, SD = .8$). The Composite Achievement Hopefulness data further reflect the tendency for the mentally tough athlete to use Stable and Global explanations for bad events ($F_{1,36} = 4.41, p = .04$). There was no significant difference between the player groups rated high and low for Mental Toughness on Composite Affiliation ($F_{1,36} = .37, ns$) or Affiliation Hopefulness ($F_{1,36} = .37, ns$).

TABLE 1
EXPLANATORY STYLE AND MENTAL TOUGHNESS: GROUP MEANS AND STANDARD DEVIATIONS

Variable	Mental Toughness Group						$F_{1,36}$
	Sample		Low		High		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Over-all Composite	1.64	.83	1.90	.85	1.40	.75	3.91*
Composite Achievement	1.51	.91	1.90	.85	1.16	.81	7.77†
Achievement Hopefulness	1.76	1.01	2.11	1.14	1.45	.79	4.41*
Composite Affiliation	3.66	2.57	3.85	2.49	3.46	2.46	ns
Affiliation Hopefulness	1.91	1.11	2.03	1.40	1.81	.80	ns

* $p < .05$. † $p < .01$.

DISCUSSION

Present results for these elite players and first-year professional ice hockey players playing below the NHL level suggest an Explanatory style similar to that found in other research (Peterson & Seligman, 1984) to be a risk factor for depression. Contrary to predictions, the on-ice behavior of these athletes suggests that players rated high on Mental Toughness use an explana-

tory style that is characterized by Internal, Stable, and Global explanations for negative events, and this puts them at higher risk for pessimistic and depressive thinking. Thus, positive on-ice behavior in adversity may be mediated by a pessimistic explanatory style.

Two areas of research are relevant to these findings. First, elite athletes with histories of success who would be expected to have high expectations for further success have been shown in other research to have unstable attributional patterns, similar to those shown here, relative to successful athletes with lower expectations (Rejeski & Brawley, 1983). Further, if such attributional patterns represent pessimism, the literature on pessimism becomes relevant. It has been suggested that some individuals who make pessimistic outcome estimates despite histories of success do not have poorer performances and, in fact, seem to require this pessimistic strategy for later success (Norm & Cantor, 1986; Baumeister, 1997). As Showers and Rubin (1990) have suggested, pessimists with histories of success may be motivated into action through a fear of failure in contrast to others who are immobilized and so vulnerable to depression. The present results suggest that the mentally tough players were pessimistic despite their histories of success and prominence in the NHL entry draft, with scout-rated evidence of a positive response to adversity, overachievement, effort, and enthusiasm.

Second, in this context the dimension of perceived controllability over negative events is critical (Weiner, 1985). It is possible that perceived control abrogates the risk for depression of internal and stable attributions for negative events. This possibility is currently being studied.

Earlier research on explanatory style in sports (Seligman, 1990; Seligman, *et al.*, 1990) suggested that long-term success yields a positive attributional pattern that is different from the pessimistic pattern seen in the present study. Two possible explanations for this discrepancy await further research. The first is that these young hockey players comprise a distinct sample relative to the collegiate subjects often tested. Another possibility is that some athletes who become pessimistic during adversity will not by virtue of scoring high on Mental Toughness show pessimism in their behavior. These athletes may simply be showing that they have learned to respond to adverse outcomes by accepting personal responsibility for them.

One limitation of this study is its reliance on scouting ratings of the players' on-ice performance. These are subjective judgements, similar to the coaching judgments used to assess whether swimmers had performed better or worse than expected in the study by Seligman and his colleagues (1990). Unfortunately, it is difficult to develop objective criteria for constructs such as "Disappointment" and "Mental Toughness," but researchers could improve the measures, for instance, by quantifying the number of times a player shows a behavior which is defined as representing mental toughness.

Research might be directed at showing whether the Pessimistic Explanatory style of the present athletes reflects their upbringing. They were for the most part athletes who had been trained in the Canadian junior system. As such, they received coaching that appears to emphasize making internal attributions for failure. In essence, they have been taught to take personal responsibility in difficult circumstances. Whether coaching style affects the development of Explanatory style may be an important question.

In conclusion, it appears that young ice hockey athletes rated as Mentally Tough can use a high risk Explanatory style for negative events without giving behavioral evidence of depressive mood.

REFERENCES

- BAUMEISTER, R. F. (1997) Esteem threat, self-regulatory breakdown, and emotional distress as factors in self-defeating behavior. *Review of General Psychology*, 1, 145-174.
- DAVIS, K., & PARGMAN, D. (1990) Emotional responses following a disappointing competitive sport experience in high level athletes. Paper presented at the annual meeting of the Association for the Advancement of Applied Sport Psychology, San Antonio, Texas, September.
- KESSLER, R. C., PRICE, R. H., & WORTMAN, C. B. (1985) Social factors in psychopathology stress, social support and coping processes. *Annual Review of Psychology*, 36, 531-572
- NOREM, J. K., & CANTOR, N. (1986) Anticipatory and *post hoc* cushioning strategies: optimism and defensive pessimism in "risky" situation. *Cognitive Therapy and Research*, 10, 347-362.
- PETERSON, C. (1988) Explanatory style as a risk factor for illness. *Cognitive Therapy and Research*, 12, 119-132.
- PETERSON, C., & SELIGMAN, M. E. P. (1984) Causal explanations as a risk factor for depression: theory and evidence. *Psychological Review*, 91, 347-374.
- REJESKI, W., & BRAWLEY, L. (1983) Attribution theory in sport: current status and new perspectives. *Journal of Sport Psychology*, 5, 77-99.
- SELIGMAN, M. E. P. (1990) *Learned optimism*. New York: Pocket Books.
- SELIGMAN, M. E. P., CASTELLON, C., CACCIOLA, J., SCHULMAN, P., LUBORSKY, L., OLOWV, M., & DOWNING, R. (1988) Explanatory style change during cognitive therapy for unipolar depression. *Journal of Abnormal Psychology*, 97, 13-18.
- SELIGMAN, M. E. P., NOLEN-HOEKSEMA, S., THORNTON, N., & THORNTON, K. M. (1990) Explanatory style as a mechanism of disappointing athletic performance. *Psychological Science*, 1, 143-146.
- SHOWERS, C., & RUBIN, C. (1990) Distinguishing defensive pessimism from depression: negative expectations and positive coping mechanisms. *Cognitive Therapy and Research*, 14, 385-399.
- WEINER, B. (1985) An attribution theory of achievement motivation and emotion. *Psychological Review*, 92, 548-573.

Accepted September 28, 1998.