

ANUARIO DE PSICOLOGÍA
Núm. 42 - 1989 (3)

REVERSAL THEORY: A NEW APPROACH
TO MOTIVATION, EMOTION
AND PERSONALITY

MICHAEL J. APTER
Purdue University
U.S.A.

Michael J. Apter
Purdue University
Department of Psychological Sciences
West Lafayette
Indiana 47907
U.S.A.

Introduction

The aim of this paper is to present a new theory of motivation, emotion and personality known as «Reversal Theory», the basic ideas of which were put forward originally by Smith and Apter in Britain in the mid-1970's, and later developed into a more complete system by Apter in his books *The Experience of Motivation* (1982a) and *Reversal Theory* (1989). There are a number of reasons why the Spanish psychologist may wish to learn something of this theory:

1. The theory is attracting increasing interest from researchers and practitioners around the world, and already three international conferences have been held on it. Papers from these have been published as two books (Apter, Fontana & Murgatroyd, 1985; Apter, Kerr & Cowles, 1988). A fourth international conference is due to take place in 1989.

2. It attempts something which has long been unfashionable in psychology: to integrate data from a variety of different areas in psychology into a unified general theory. At the same time it does not lose sight of the practical aspect, and indeed it was originally developed in the context of a child guidance clinic, and is currently being used by clinicians in a variety of contexts, as well as by psychologists in other applied settings.

3. One aspect of its originality is that it introduces a new level of analysis into psychological discourse: the metamotivational level. It also postulates a new process of psychological change, that of metamotivational reversal, which it suggests should be added to those change processes which have previously been the main areas of interest and theoretical significance in psychology — most notably the processes of learning and maturation.

4. It challenges a number of basic assumptions and emphases in psychology, especially the assumption of homeostasis in theories of motivation and the emphasis on consistency in personality theory and psychometrics. In this way it invites radical re-thinking in these —and other— areas (Apter, 1984a).

There will not be sufficient space in this paper to do more than sketch in several of the central ideas, but enough will be said to impart something of the flavor of the theory, and to give some ideas of the general approach involved. It is to be hoped that the reader will appreciate that the theory is less dogmatic and more subtle and complex than might appear from his necessarily brief account.

Some Basic Concepts

The starting point for reversal theory analyses, as implied by the title of

Apter's book, *The Experience of Motivation* (1982), is always some aspect of the way in which motivation is experienced.

Let us take as an example of the reversal theory approach to a central question in the field of motivation: that of the relationship between the experienced intensity of arousal and hedonic tone. In its approach to this question reversal theory differs markedly from optimal arousal theory, which of course has dominated research on arousal for a considerable period. Although optimal arousal theory, following Hebb & Thompson (1954) and Hebb (1955) has taken many different forms, all optimal arousal theorists appear to assume that there is only one arousal system and that this system has a single optimal point on the arousal dimension. (In what follows, «optimal» and «preferred» will relate to hedonic tone rather than performance). Thus, arousal is seen as essentially homeostatic, and the resulting curve relating arousal and hedonic tone takes the form of an inverted U.

Reversal theory, by contrast, argues that there are two alternative systems, each with its own optimal point, and in place of the notion of homeostasis, therefore, it substitutes the more complex notion of *bistability* (Apter, 1981). Furthermore, it argues that these two optimal points or «preferred levels», are toward opposite ends of the arousal dimension. So instead of there being one level of preferred arousal to which the organism attempts to return, and which is felt as pleasant when obtained, reversal theory suggests that there are two such levels, only one of which is preferred at a given moment, this being the preferred level of the arousal system that is operative at that moment. Since the two alternative preferred levels are assumed to be toward *opposite* ends of the felt arousal dimension, switches between the systems involved are referred to as *reversals*.

This idea can be made clear by reference to Figure 1, in which there are *two* hypothetical curves relating arousal to hedonic tone instead of the single curve of optimal arousal theory. Each of these curves relates to a different systems, one of which may be thought of as an «arousal-avoiding» systems and the other as an «arousal-seeking» system. At any given level of actual experienced arousal, it is possible, according to the theory, to switch from the curve representing one of these systems to the curve representing the other—that is, a reversal may occur—. One of the results of such a reversal may be a sudden change of hedonic tone in relation to the level of arousal experienced at that moment. Since the two systems are characterized by different ways of *interpreting* a motivational phenomenon—arousal—they are described in reversal theory as *metamotivational* rather than motivational; and reversal from one to another such metamotivational system therefore constitutes a *metamotivational* reversal.

This view of the relationship between felt arousal and hedonic tone presents a number of advantages over the optimal arousal theory interpretation. These can be summarized as follows.

1. It accounts more easily than optimal theory for the fact that on some occasions even very high arousal can be pleasant (e.g., during sexual behavior, or watching football or a bull-fight) and on other occasions even very low arousal can be pleasant (e.g., relaxing during a *siesta* or after a hard day's work).
2. It accounts for *four* nouns that describe the four different combinations

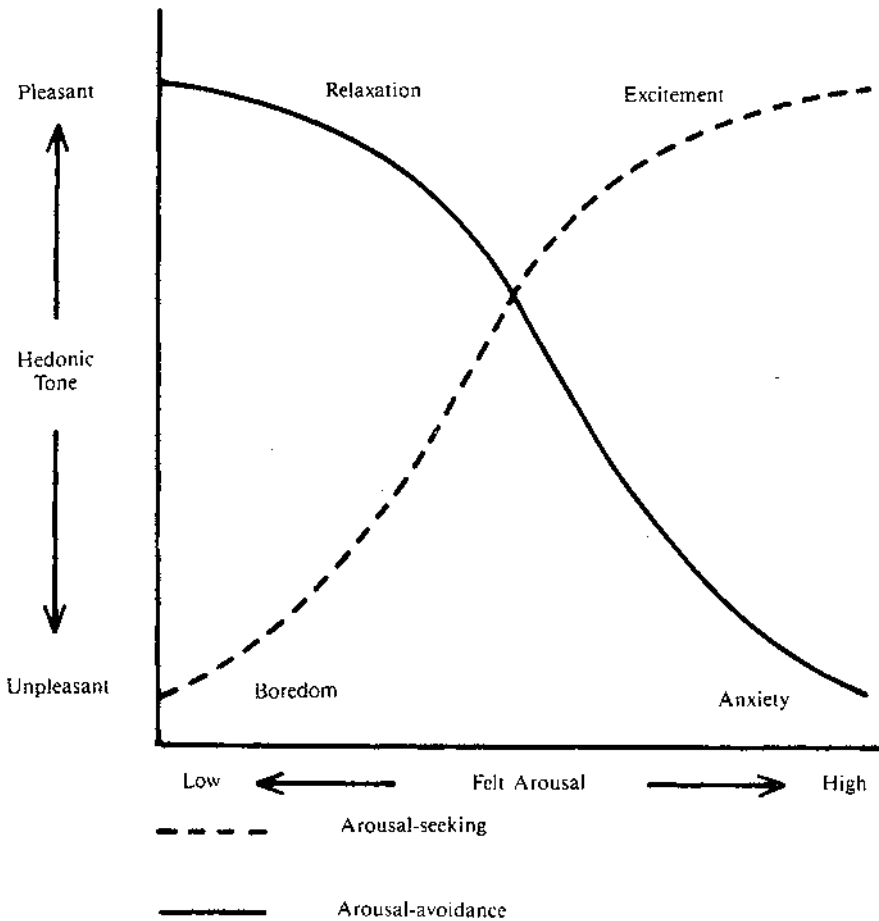


FIGURE 1

of pleasant and unpleasant high and low levels of arousal —namely, excitement, anxiety, relaxation, and boredom— and it brings out the structural relationship between them. These four types of arousal are shown in the appropriate positions on the graph. By contrast, optimal arousal theory has difficulty in assimilating these four adjectives to its single curve and has to do so by making such unwarranted assumptions as that excitement is always a lower form of arousal than anxiety (cf. Hebb, 1955). This particular assumption of optimal arousal theory also implies that as arousal increases, excitement will always be felt before anxiety, and that it will always be felt after anxiety as arousal decreases —an implication for which there is no evidence and which would appear to be totally inconsistent with everyday experience.

3. It allows for the possibility of certain rapid changes in the way in which

arousal is felt. For example, it explains how anxiety can be converted almost instantaneously into excitement and vice versa. Like Zillmann's excitation-transfer theory (e.g., Zillmann, 1984), it helps to explain such psychological phenomena as the enjoyment of dangerous sport by suggesting that residual arousal is enjoyed as excitement after the danger which produced the arousal has been overcome.

The two different arousal-preference systems are, according to reversal theory, associated closely with (and may be regarded from some perspectives as subsystems of) a more all-embracing pair of metamotivational systems, which have been labelled in the theory as «telic» and «paratelic» (from the Greek words «telic» meaning a «goal» and «para» meaning «alongside»). These two systems are most conveniently characterized in terms of the phenomenological states with which they are associated. The telic state is defined as a state of mind in which one conceives oneself to be pursuing an important goal, the behavior being subsidiary and chosen to achieve the goal. The paratelic state of mind is one in which the orientation is toward the behavior itself, together with its concomitant sensations, in this case any goal being conceived as subsidiary and essentially an excuse for the behavior. In other words, there is a sense in which the goal is at the focus of the phenomenological field in the telic state and the ongoing activity is at the focus in the paratelic state. When a reversal does occur, this is somewhat analogous to a figure-ground perceptual reversal, with the figure being in one case a goal and in the other a form of activity.

For example, in walking somewhere in the telic state one will conceive of one's goal —e.g., to arrive in time for an interview— as of overriding importance, and if it begins to appear that one will not achieve this goal one will choose some other means (for example, take a taxi). If on the other hand one is walking somewhere in the paratelic state, then one's centre of interest is in enjoying the walk; and if in this case it turns out that one's destination is beyond one's reach in the time available, one will simply choose another destination, while continuing with one's walk.

In the telic state, which is the state associated with low arousal preference, the state of mind is a serious one, and the concern is more likely to be with the future than the present; in this state the individual tries to plan ahead wherever possible. Anxiety arises if barriers to goal achievement occur, but the achievement of a goal produces relaxation. In the paratelic state, which is the state associated with high arousal preference, the state of mind is a more lighthearted or playful one in which the orientation is toward the present moment and its enjoyment; it is also characterized by a preference for spontaneity rather than planning. Intense experiences in this state are felt to be exciting, while a failure to achieve such intensity produces the experience of boredom.

Reversal theory, then, sees the telic and paratelic states as a bistable pair of opposite but complementary phenomenological states, each associated with its own underlying system, and with the continual possibility of reversal between these states/systems. Although these states are defined in terms of the primary of goal or activity within experience, it will now be appreciated that the states themselves, and their underlying systems, are complex and involve a number of related characteristics or components.

What, then, are the factors which bring about, or facilitate, reversals between the telic and paratelic systems? Three general classes of such factors have been proposed:

1. *Contingent factors.* By this is meant events and situations which, when suitably interpreted by the individual, facilitate or induce a reversal. For example, a sudden physical danger may induce the telic system if it is not already in operation, while escape from such a danger may play a part in inducing the paratelic system; social cues like frowning may facilitate reversal to the telic system while cues like smiling and laughing may facilitate reversal to the paratelic; and some contexts, like a waiting room at a hospital, will normally help to bring about a reversal into the telic mode whereas others, like the sports stadium, will normally help rather to bring the paratelic system into operation.

2. *Frustration.* The second general category is that of frustration of all kinds in achieving the satisfactions of the prevailing system, so that if the frustration is strong enough it will eventually induce the opposite system on its own or with the help of other factors. For example, if one is unable to achieve a serious goal one may switch at a certain point to the paratelic system and playfully fantasize goal achievement.

3. *Satiation.* By this is meant that there is an innate process which operates independently of contingent events in such a way as increasingly to facilitate reversal from the prevailing system over time. In other words, it builds up in strength until it is strong enough, with other factors, to bring about a reversal; and eventually it will become strong enough to bring about a reversal on its own even in the absence of other factors. Having brought about the reversal and dissipated its strength, it will start building up again in such a way as to help to induce a new reversal. So what is being suggested here is that there is an innate dynamic for change. In this the relationship between telic and paratelic systems is seen as not unlike that between waking and sleeping: when one has been awake long enough one will eventually go to sleep despite other factors, and when one has been asleep long enough one will eventually wake up if one has not been woken up in the meantime by some external occurrence.

One thing which this third postulate does is to show quite clearly that reversal theory is not a theory of situational specificity: because of the process of satiation it is quite possible to confront a certain situation in the telic system on one occasion and the paratelic system on another, and indeed to reverse backward and forward from one system to the other during the course of the same continuing activity. It will be realized from all this that reversal is conceived to be an involuntary process which occurs when the factors for change are, in combination, stronger than those which would inhibit it.

Reversal Theory and Personality

One general point about reversal theory, as should now be evident, is that it implies an inherent inconsistency and self-contradiction in human nature. At

one moment a person may crave excitement and at another avoid exactly those arousing situations which he was so keen to experience a short time before; at one time he may experience his job as an obligation and at a later time experience the very same job as a kind of game. In such ways people differ not only from each other but from themselves at different times (and even when confronted by the same situation). In other words, there is a kind of internal dialectic, which underlies the changeability and complexity of human experience and behavior.

However, this is not to deny that there are consistencies within individuals. One of these is the innate bias or tendency which they may have to be subject to one system or the other. This is known in reversal theory as «dominance». Thus the telic dominant individual is the person who is more likely at a given time, other things being equal, to be doing something which he or she conceives to be serious and important, attempting to avoid anxiety, and more likely to be seeing the current activity in a long-term perspective, than the paratelic dominant individual. The latter is more likely, other things being equal, to be feeling and acting in a light-hearted, playful, and here-and-now oriented way, and looking for excitement. How far this is likely in each case will depend on the degree of telic or paratelic dominance involved. Another way of putting this is to say that the factors which tend to induce the paratelic system have to be stronger in order to bring about such a reversal in the telic dominant than the paratelic dominant person, and vice versa for those factors which then to induce the telic system.

However, it must be emphasized that telic/paratelic dominance is not a trait in the conventionally accepted sense, since telic dominant people will still be expected to spend certain periods in the paratelic system, and may be just as playful and excitement-seeking when this system is operating as those who are telic dominant. At the same time, as we have seen, the telic and paratelic systems are also not situationally dependent in any simple way, or simple one-emotion states; and so reversal theory is also not a state theory in the usually sense. Rather, it introduces a whole new approach to the traditional, and increasingly sterile, state-versus-trait debate.

The theory as a whole

It should be added that three other pairs of metamotivational systems have also been postulated in reversal theory (Apter, 1983, 1988, 1989): the negativism/conformity pair, mastery/sympathy pair and the autocentric/allocentric pair. The first of these concerns the opposite ways in which an individual can see himself to be acting in relation to external rules and pressures (with them or against them); the second is about the opposite ways in which transactions between self and other can be experienced (as involving taking or yielding in the case of mastery, and giving or being given in the case of sympathy); and the third is about whether the individual is acting on his own behalf or that of someone else with whom he is identifying. Each member of each pair is associated with its own unique range of emotions. More information on these and other reversal theory concepts like «cognitive synergy» (the experience of mutually contradictory proper

ties in relation to an object, person or situation) will be found in Apter (1982, 1989) and Apter *et al* (1985, 1988).

These concepts, taken together, allow reversal theory to provide a coherent and unitary explanation for a wide range of apparently diverse and unrelated phenomena. These include, for example, addiction (O'Connell, 1988, Doherty & Matthews, 1988), esthetic experience (Apter, 1982c, 1984b) sexual dysfunction and perversion (Apter & Smith, 1979a), antisocial behavior in childhood, adolescence, and old age (Apter, 1983; Bowers, 1985), family interaction patterns (Apter & Smith, 1979b), the generation of religious myths and rituals (Apter, 1985), creativity (Fontana, 1985), soccer hooliganism (Kerr, 1988), sports performance (Kerr, 1987), gambling (Brown, 1987), and the enjoyment of humor. For example, it is argued that humor is a special form of paratelic high arousal which is also characterized by a number of other specifiable subjective properties having to do with cognitive synergy (Apter & Smith, 1977; Apter, 1982b; Svebak & Apter, 1987).

Empirical Research on Reversal Theory

One of the ways in which the hypotheses of reversal theory have been investigated is through the development of psychometric measures. In particular, a measure of telic dominance has been developed. This is the Telic Dominance Scale (TDS) (Murgatroyd, Rushton, Apter, & Ray, 1978) consisting of three subscales to measure seriousmindedness, planning-orientation and arousal-avoidance. This scale has now been used for a variety of purposes, experimental and applied, in many countries throughout the world and there are translations into a number of languages. (For a survey of the development, validation and application of this scale, see Murgatroyd, 1985). A conveniently simple measure of telic/paratelic states is also now available (Svebak & Murgatroyd, 1985), this indicating whether the telic system is operating at a given moment in time (i.e., the individual is «in the telic state») or the paratelic system (i.e., the individual is «in the paratelic state»).

A major way in which such measurement devices have been used is in the investigation of the psychophysiology of both telic dominance and of the telic and paratelic systems. Svebak and his colleagues, in a series of reports (e.g., Svebak, 1983, 1984, 1985a, 1986a & b; Apter & Svebak, 1986; Svebak & Murgatroyd, 1985; Svebak & Grossman, 1985; Svebak, Nordby & Ohman, 1987; Svebak, Storfjell & Dalen, 1982), have shown that these states/systems and/or forms of dominance have certain identifiable physiological characteristics, demonstrating that they are not just phenomenological constructs but are grounded in solid biological «reality». For example, electromyographic gradients from passive musculature are significantly steeper in subjects in the telic than the paratelic state when these subjects have to exert effort in some experimental situation; heart rate acceleration is significantly greater in telic dominant than paratelic dominant subjects under conditions of threat; deeper thoracic breathing is found in telic dominant sub-

jects; and paratelic dominant subjects show higher EEG power-spectrum scores (parietal) for the *theta* and *beta* bands than telic dominant subjects during task performance, indicating that paratelic dominant subjects may be characterized by large cortical areas operating in synchrony «driven» by a common source rather than the comparatively small areas in synchrony that appear to be more representative of telic dominant subjects. These and other findings are reviewed and discussed in detail by Svebak (1985b) and Apter (1989).

If the sign of the strength of a theory is that it gives rise to unexpected discoveries that would not have been predicted by other theories, this representing what Lakatos (1974) has designated a progressive rather than degenerating research programme, then reversal theory may be said to be showing signs of strength. Here are two examples. Firstly, reversal theory would predict that it is *not* the case that everyone is upset to some degree or another by stress. On the contrary, reversal theory would make the surprising prediction that some people, i.e., paratelic dominant individuals, would be likely to enjoy stress up to a certain point because this would cause higher arousal, and high levels of arousal are enjoyed by such individuals. (Above a certain point, however, the telic state would be likely to be induced even in those who are strongly paratelic dominant so that the effect would die away beyond these levels of stress). Evidence exactly consistent with this prediction has been presented by Martin (1985), and Martin, Kuiper, Olinger, & Dobbin (1987) who showed that for telic dominant subjects, the greater the stress, the greater the mood disturbance. But for paratelic dominant subjects, exactly the reverse relationship was found: up to a certain level of stress, the more the stress the better the mood. It was not that these subjects were simply less vulnerable to stress: they were thriving on it and positively enjoying it. (Beyond this point the relationship became the same as that for telic dominant subjects, implying that increasing numbers of this group were reversing to the telic state as stress built up). This evidence may be said to be strongly supportive of the unique reversal theory view of stress.

Secondly, if people have a choice of a range of stimuli which can be placed along a dimension from highly arousing to highly de-arousing, reversal theory would predict that, since everyone at a given moment is either in the arousal-seeking or arousal-avoiding state, they will tend to choose stimuli from the extremities of such a dimension rather than more centrally-placed stimuli, and to switch from time to time from a preference for stimuli at one extremity to a preference for stimuli at the other. Using color stimuli from across the spectrum, analyzed for each individual in terms of how arousing or de-arousing each color was for them personally, Walters, Apter, & Svebak (1982) found that, when subjects (116 office workers) were asked to make color preference choices at regular intervals during the working day (some of the subjects being tested for as many as eight days), they did indeed behave in the way expected—uniquely—by reversal theory. That is, they tended to choose either colors which they personally found highly arousing or highly de-arousing, ignoring intermediate colors, and to reverse from time to time from one relative extreme to the other.

A recent and more detailed and extensive review of all the research which has been carried out to date on reversal theory will be found in Apter (1989).

Conclusions

The basic postulate of reversal theory is that there are a number of pairs of alternative systems available to the individual for interacting with his or her environment, and at any given time a subset of these (one from each of the pairs) will be in operation. Thus at one time the individual may be characterized as in the telic, conformist, mastery and autocentric states, at another as in the paratelic, conformist, sympathy and autocentric states, and so on. This means that from the reversal theory perspective the individual is continually in flux; and it is argued that any psychological theory which does not take into account such changeability will produce an oversimplified and unconvincing model of human nature.

As we have seen, these alternative systems are characterized by reversal theory as metamotivational, and it is claimed therefore that the metamotivational level and the changes which take place at this level, must be taken into account if a full and meaningful picture of human activity is to be achieved. Among other things this constitutes, as we have seen, a challenge to all theories of motivation which are based on the idea of homeostasis or equilibrium, and all theories of personality which are more interested in consistencies than inconsistencies—in other words to all previous major theories of motivation and personality.

SUMMARY

The aim of this paper is to present a new general theory of motivation, emotion and personality known as «Reversal Theory». Some of the main concepts of the theory are briefly outlined, especially the notions of bistability (which is contrasted with homeostasis), metamotivation and metamotivational reversal, the telic and paratelic systems, and metamotivational dominance. Some empirical research generated by reversal theory, including psychometric and psychophysiological research, is also briefly reviewed.

REFERENCES

- Apter, M.J. (1981). On the concept of bistability. *International Journal of General Systems*, 6, 225-232.
- Apter, M.J. (1982a). *The experience of motivation: The theory of psychological reversals*. London and New York: Academic Press.
- Apter, M.J. (1982b). Fawcety towers: A reversal theory analysis of a popular television comedy series. *Journal of Popular Culture*, 16(3), 128-138.
- Apter, M.J. (1982c). Metaphor as synergy. In David S. Miall (Ed.), *Metaphor: Problems and perspectives* (pp. 55-70). Sussex: Harvester Press.
- Apter, M.J. (1983). Negativism and the sense of identity. In G. Breakwell (Ed.), *Threatened identities* (pp. 75-90). London: Wiley.
- Apter, M.J. (1984a). Reversal theory and personality: A review. *Journal of Research in Personality*, 18, 265-288.
- Apter, M.J. (1984b). Reversal theory, cognitive synergy and the arts. In W.R. Crozier and A.J. Chapman

- (Eds.), *Cognitive processes in the perception of art* (pp. 411-426). Amsterdam: North-Holland (Elsevier).
- Apter, M.J. (1985). Religious states of mind: A reversal theory interpretation. In L.B. Brown (Ed.), *Advances in the psychology of religion* (pp.62-75). Oxford: Pergamon Press.
- Apter, M.J.(1988). Reversal theory as a theory of the emotions. In M.J. Apter, J. Kerr, & M. Cowles (Eds.), *Progress in reversal theory*. Amsterdam: North-Holland Press (Elsevier).
- Apter, M.J. (1989). *Reversal theory: Motivation, emotion and personality*. London: Routledge.
- Apter, M.J., Fontana, D. & Murgatroyd, S. (Eds.), (1985). *Reversal theory: Application and developments*. Cardiff: University College Cardiff Press and New Jersey: Lawrence Erlbaum.
- Apter, M.J., Kerr, J.H. & Cowles, M. (Eds.), (1988). *Progress in reversal theory*. Amsterdam: North-Holland Press (Elsevier).
- Apter, M.J., & Smith, K.C.P. (1977). Humour and the theory of psychological reversals. In A.J. Chapman & H.C. Foot (Eds.), *It's a funny thing, humour* (pp. 95-100). Oxford: Pergamon Press.
- Apter, M.J. & Smith, K.C.P. (1979a). Sexual behavior and the theory of psychological reversals. In M. Cook & G. Wilson (Eds.), *Love and attraction: An international conference* (pp. 405-408). Oxford: Pergamon Press.
- Apter, M.J. & Smith K.C.P. (1979b). Psychological reversals: Some new perspectives on the family and family communication. *Family Therapy*, 6(2), 89-100.
- Apter, M.J. & Svebak, S. (1986). The EMG gradient as a reflection of metamotivational state. *Scandinavian Journal of Psychology*, 27, 209-219.
- Bowers, A.J. (1985). Reversals, delinquency and disruption. *British Journal of Clinical Psychology*, 25, 303-304.
- Brown, R.I.F. (1987). Classical and operant paradigms in the management of gambling addictions. *Behavioural Psychotherapy*, 15, 111-122.
- Doherty, O. & Matthews, G. (1988). Personality characteristics of opiate addicts. *Personality and Individual Differences*, 9(1), 171-172.
- Fontana, D. (1985). Educating for creativity. In. M.J. Apter, D. Fontana, & S. Murgatroyd (Eds.), *Reversal theory: Applications and developments*. Cardiff: University College Cardiff Press and New Jersey: Lawrence Erlbaum.
- Hebb, D.O. (1955). Drives and the C.N.S. (Conceptual Nervous System). *Psychological Review*, 62, 243-254.
- Hebb, D.O. & Thompson, W.R. (1954). The social significance of animal studies. In G. Lindzey (Ed.), *Handbook of Social Psychology*. Cambridge, MA: Addison-Wesley.
- Kerr, J.H. (1987). Structural phenomenology, arousal and performance. *Journal of Human Movement Studies*, 13(5), 211-229.
- Kerr, J.H. (1988). The psychology of soccer hooliganism. In M.J. Apter, J. Kerr, & M. Cowles (Eds.), *Progress in reversal theory*. Amsterdam: North-Holland Press (Elsevier).
- Lakatos, I. (1974). Falsification and the methodology of scientific research programmes. In I. Lakatos & A. Musgrave (Eds.), *Criticism and the Growth of Knowledge*. Cambridge: Cambridge University Press.
- Martin, R. (1985). Telic dominance, stress and moods. In M.J. Apter, D. Fontana, & S. Murgatroyd (Eds.), *Reversal theory: Applications and developments*. Cardiff: University College Cardiff Press and New Jersey: Lawrence Erlbaum.
- Martin, R.A., Kuiper, N.A., Olinger, L.J. & Dobbin, J. (1987). Is stress always bad?: Telic versus paratelic dominance as a stress moderating variable. *Journal of Personality and Social Psychology*, 53(5), 970-982.
- Murgatroyd, S. (1985). The nature of telic dominance. In M.J. Apter, D. Fontana, & S. Murgatroyd (Eds.), *Reversal theory; Applications and developments*. Cardiff: University College Cardiff Press and New Jersey: Lawrence Erlbaum.
- Murgatroyd, S., Rushton, C., Apter, M.J. & Ray, C. (1978). The development of the Telic Dominance Scale. *Journal of Personality Assessment*, 42(5), 519-528.
- O'Connell, K.A. (1988). Reversal theory and smoking cessation. In M.J. Apter, J. Kerr, & M. Cowles (Eds.), *Progress in reversal theory*. Amsterdam: North-Holland Press (Elsevier).
- Sevbak, S. (1983). The effect of information load, emotional load and motivational state upon tonic physiological activation. In H. Ursin & R. Murison (Eds.), *Biological and psychological basis of psychosomatic disease: Advances in the Biosciences, Vol 42* (pp. 61-73). Oxford: Pergamon Press.
- Sevbak, S. (1984). Active and passive forearm flexor tension patterns in the continuous perceptual-motor task paradigm: The significance of motivation. *International Journal of Psychophysiology*, 2, 167-176.
- Svebak, S. (1985a). Serious-mindedness and the effect of self-induced respiratory changes upon parietal EEG. *Biofeedback and self regulation*, 10, 49-62.
- Svebak, S. (1985b). Psychophysiology and the paradoxes of felt arousal. In M.J. Apter, D. Fontana & S.

- Murgatroyd (Eds.), *Reversal theory: Applications and developments*. Cardiff: University College Cardiff Press and New Jersey: Lawrence Erlbaum.
- Svebak, S. (1986a). Cardiac and somatic activation in the continuous perceptual-motor task: The significance of threat and seriousness. *International Journal of Psychophysiology*, 3, 155-162.
- Svebak, S. (1986b). Patterns of cardio-somatic-respiratory interaction in the continuous perceptual-motor task paradigm. In P. Grossman, K. Janssen & D. Vaiti (Eds.), *Cardiorespiratory and cardiosomatic psychophysiology*. New York: Plenum.
- Svebak, S., & Apter, M.J. (1987). Laughter: An empirical test of some reversal theory hypotheses. *Scandinavian Journal of Psychology*, 28, 189-198.
- Svebak, S. & Grossman, P. (1985). The experience of psychosomatic symptoms in the hyperventilation provocation test and in non-hyperventilation tasks. *Scandinavian Journal of Psychology*, 26, 327-335.
- Svebak, S. & Murgatroyd, S. (1985). Metamotivational dominance: A multi-method validation of reversal theory constructs. *Journal of Personality and Social Psychology*, 48(1), 107-116.
- Svebak, S., Nordby, H. & Ohman, A. (1987). The personality of the cardiac responder. Interaction of seriousness and Type A behavior. *Biological Psychology*, 25, 1-9.
- Svebak, S., Storfjell, O. & Dale, K. (1982). The effect of a threatening context upon motivation and task-induced physiological changes. *British Journal of Psychology*, 73(4), 505-512.
- Walters, J., Apter, M.J. & Svebak, S. (1982). Colour preference, arousal and the theory of psychological reversal. *Motivation and emotion*, 5(1), 47-59.
- Zillmann, D. (1984). *Connections between sex and aggression*. New Jersey: Lawrence Erlbaum.

