COPING BEHAVIOR IN THE NATURAL SETTING: A METHOD OF COMPUTER-AIDED SELF-OBSERVATION*

Meinrad Perrez, Michael Reicherts

ABSTRACT

We present a procedure for a computer-aided self-observation of coping behavior in stressful situations. This procedure allows us to record stress in everyday life with a compact pocket computer in a process-related way close to the event. Cognitive, affective and behavioral aspects are considered. At present the procedure is being validated with data from a process-oriented questionnaire developed beforehand and conceived on the same theoretical basis. Effects of reactivity and influences of variables concerning defence-styles and self-attentiveness are tested.

TRADITIONAL ASSESSMENT OF COPING BEHAVIOR

The recording of psychological features in coping behavior has thus far been concentrated on so-called "self-report" data. The structural degree of the recording procedures varies from fully standardized questionnaires with hypothetical situations to narrative reports in which the test-persons describe stressing situations they have experienced themselves. In other questionnaires (S-R inventories) the subjects have to describe how they would respond to a set of given hypothetical situations. The possibilities of response can be left open or given (multiple choice).

The existing questionnaire procedures for the recording of tendencies in coping behavior have sacrificed their advantage of high economy at the cost of uncertain validity. Furthermore, processes have usually not been recorded. Even though R.S. Lazarus attaches great importance to the aspect of process in coping behavior, his questionnaire does not allow any conclusion in this respect. Billings and Moos (1981) base their statements on one stressing event each, i.e., on a sample of coping which is not necessarily representative. Janke, et. al., (1978) have developed a questionnaire for the evaluation of stress that reveals typical responses to not clearly defined stressing situations. Thus, the coping tendencies, specific or typical for the situation, cannot be recorded in their original form. An adaptation for specific situations, however, is basically possible with this procedure. As to Krohne and his collaborators (Krohne, Wigand & Kiehl, 1985), their coping-inventory asks for coping tendencies in relation to specific situations.

Recently, investigators have also tried to portray processes, with the help of questionnaires, by the successive input of hypothetical situational chains (S-R-S-R questionnaires). Perrez and Reicherts have developed such an instrument (1986, 1987; see also Reicherts, 1985, and Reicherts & Perrez, 1986). The advantages of such procedures lie in the standardization of the situations--compared to the questionnaire of Folkman and Lazarus (1980) e.g., in which the responses to real stressing situations are questioned--and in their simple application. They are, however, bound to the problem of appropriate representation and reconstruction of one's own behavior and experience. They probably better display the coping-related picture of the self than real experience and

---

University of Fribourg, Switzerland

behavior. Access to data of experience and behavior may pose problems, particularly to certain psychopathological groups; therefore distortions are to be expected, which are probably stronger, the longer the temporal interval between the inquiry and the real event.
Besides the self-report procedures, there exist approaches to coping behavior by external observation of physiological characteristics which are applied especially within the scope of experiments (e.g. Fenz & Epstein, 1962), though hardly any application for diagnostic purpose have been made thus far. This is also true for a systematic external observation of psychological characteristics of coping behavior. Horowitz and Wilner (1976), and Zeitlin (1980) have provided examples, the first by a pre-setting of real stressing agents under experimental conditions, and the seconds by an observation of coping in real situations. The different approaches used to record psychological characteristics of coping behavior can be summarized in the following matrix. It distinguishes on the one hand data sources, and on the other hand experimental settings or the different ways to present the situations.

Figure 1: The Matrix of data sources as a function of situation with a few examples.

SITUATIONS RELATED TO THE RECORDED COPING VARIABLES / DATA SOURCES	HYPOTHETICAL SITUATIONS	LABORATORY SITUATIONS WITH REAL (OR FILMED) STRESSING AGENT	REAL SITUATIONS IN THE FIELD
SELF-REPORT	- KROHNE, WIGAND & KIEHL, 1985 - BECKER, 1984 - REICHERT & PERREZ, 1986 (UBV)	- KROHNE, 1984 - LAZARUS ET AL., 1962	- FOLKMAN & LAZARUS, 1980 - FOLKMAN, 1982: WAYS OF COPING CHECKLIST DEUTSCHE VERSION SEBV: BRAUKMANN & FILLIP, 1983
EXTERNAL OBSERVATION OF PSYCHOLOGICAL FEATURES		- HOROWITZ & BECKER, 1971 A,B - HOROWITZ & WILNER, 1976 - SCHERER ET AL., 1985	- MECHANIC, 1962 - ZEITLIN, 1980
EXTERNAL OBSERVATION OF PHYSIOLOGICAL FEATURES	- LANG ET AL., 1983 - HÄNGGI & SCHEDLE, 1987	- LAZARUS ET AL., 1962 - OTTO, 1984 - SCHERER ET AL., 1985	- FENZ & EPSTEIN, 1967

COMPUTER-AIDED SELF-OBSERVATION: GOALS AND THEORETICAL REQUIREMENTS

Pawlik and Buse (1982) have developed a computer-based behavior recording method that allows reliable self-reporting of ecological and psychological variables in field conditions. Inspired by this approach, we developed a procedure to reach higher ecological validity and to reduce the temporal distance between the experienced stressing situation and its recording. This should allow an examination of stress-response situations in everyday life. Stress-response situations are externally or internally released real events, differing from non-stressing events particularly in their psychological reality for the concerned individual (cf. Lazarus & Launier, 1978). Stressful episodes start with a disturbance of the psychical homeostasis, followed by attempts to regain psychical balance. To observe the psychological characteristics of coping processes, we presuppose model conceptions of psychologically relevant situational and coping characteristics. We based this on the theoretical foundations of our UBV-questionnaire developed beforehand (Perrez & Reicherts, 1986). Our choice of situational characteristics includes a free description of the situation and the subjective rating of the valence, i.e., the degree of infringement or hindrance, the quality of emotions, the subjective rating of the degree to which the situation is controllable, the degree of the subjective probability that a situation will change by itself (changeability), and the ambiguity, viz. the vagueness of the stressing event. The specific purposes of the subject in the stressing situation are also considered important. Coping operations are distinguished according to whether they are self-directed or environment directed. Those operations that exert an influence on the environment are classified into the following reaction types: active, evasive, or passive behavior and resort for support. We divide the self-oriented coping operations into search for information, suppression of information, palliation of emotions, self-punishment, and reevaluation.

The most important aims in the development of a computer-aided self-observation method under field conditions are:

1) the possibility of recording experience and behavior data close to the field.

2) structural recording of psychologically relevant data.

Ad 1): As a pocket computer can be carried along easily in everyday life (size: 18 x 7 x 1.5 cm; weight: 190 gr.), it allows the input of information right after having experienced a stressing event or even during the event proper. This condition is, of course, not always given--but often it is, as our first experiences have shown. In this manner the time between the event and its recording, as well as cognitive processes of distortion can be reduced. For the recording of 30 to 40 stressing events our test persons needed an average of four weeks. This sample of stressful situations personal also provides insight into the stress patterns as they are relevant for a given person during the recording period.

Ad 2): The self-recording is structured according to psychologically relevant characteristics known from stress and control research. The structuring considers features of perception, affective features, aims, and coping behavior in their temporal evolution. It is also possible to observe reoccurring or unfinished stressing events over several days. Self-observation presupposes trained self-observers. So we do not refer to naive but to qualified self-observers since they are made familiar with the method beforehand in a training session.

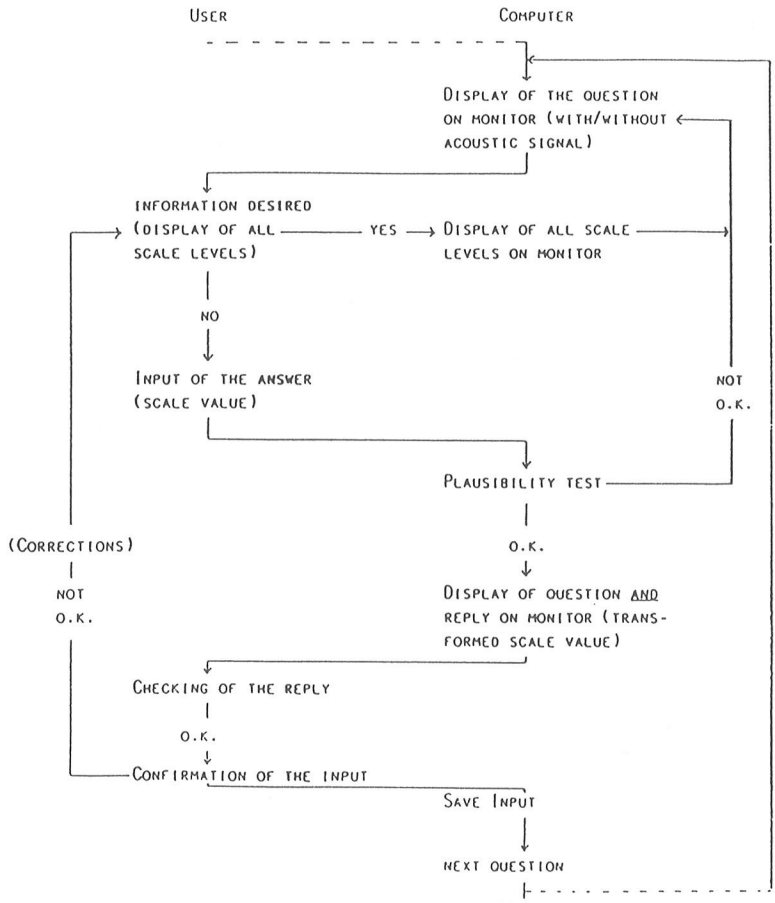
CONSTRUCTION OF THE METHOD (COMES)

The goals described above presuppose a simple and universally applicable recording and rating system that describes and evaluates the most important features of a given stressing situation, and that describes relevant features of experiencing. The goals also presuppose a system of categories for the portrayal of executed self-related and environment-related coping attempts. In order to realize the self-recording in everyday life, we above all had to master problems of simplification. In a self-applied experiment, the co-operators of the project tested the first solutions suggested at a primary stage. This pre-experiment led, among other things, to the result that the instrumental coping behavior is not only questioned by given categories of answers, but that the test persons are now induced to put the behavior they have chosen using keywords as alpha information into the computer themselves.

Figure 2: Questions of UBV-Comes for stress-coping situations topic.

TOPIC	INPUT-CHARACTER	SCALE LEVELS
* CHARACTERIZATION OF SITUATIONS:		
- CONNECTION: INITIAL OR RECURRING SIUTATION	CATEGORICAL	2
- DESCRIPTION IN KEYWORDS	TEXT	
- DURATION	SCALE	5
* EMOTIONAL LOCATION:		
- PROFILE IN 6 DIMENSIONS	SCALES	6
- FURTHER DESCRIPTION POSSIBLE	TEXT	
* SITUATIONAL FEATURES		
- VALENCE	SCALES	6
- CHANGEABILITY	SCALES	6
- CONTROLABILITY	SCALES	6
- AMBIGUITY	SCALES	6
- PROBABILITY OF REOCCURANCE	SCALES	6
* AIM(S) OF COPING	TEXT	
* COPING BEHAVIOR OR COPING ATTEMPTS		
- INDIVIDUAL-RELATED:		
X LOOKING FOR INFORMATION	SCALES	3
X SUPPRESSION OF INFORMATION	SCALES	3
X REEVALUATION	SCALES	3
X PALLIATION	SCALES	3
X SELF-REPROACHES	SCALES	3
- ENVIRONMENT-RELATED		
X EVASION (RETREAT, AVOIDANCE)	SCALES	3
X PASSIVITY (WAITING, RESIGNATION)	SCALES	3
X RESORT TO SUPPORT	SCALES	3
X ACTIVE INFLUENCE	SCALES	3
FURTHER BEHAVIORAL DESCRIPTION	TEXT	
* COPING SUCCESS (SO FAR)	SCALE	3
* REPRESENTATIVITY OF SITUATION		
- FAMILIARITY OF SITUATION	SCALES	6
- BEHAVIORAL TYPE	SCALES	4
- BEHAVIORAL DISCREPANCY: IDEAL/REAL	SCALES	3
* ATTRIBUTION: COPING SUCCESS / SITUATIONAL RESULT		
- INTERNAL	SCALES	4
- EXTERNAL ON PERSONS	SCALES	4
- EXTERNAL ON CIRCUMSTANCES	SCALES	4
* DATE AND TIME	TEXT	

Figure 3: Question-reply interaction for scale input.



The development of the program (1) had to consider criteria of software-ergonomica, of security, storage-economy, and processing speed. It was essential for the program to structure the interaction of the user. If the program is started at the decision of its user, it presents a sequence of questions asking for a series of answers for their processing.
In order to improve the input quality, the following sequences of operating instructions were chosen as a basic pattern. (fig. 3 and fig. 4)

---

(1) We wish to cordially thank Dipl.-Psych. Robert Matathia for his support in the programming task.

For questions requesting a scaled answer, the numerical scale levels were always presented simultaneously. Then, the given answer is directly transformed into the verbal label of the scale level, which must be directly corrected or confirmed. An information key allows a display of the corresponding scale level on the screen at any stage of the scaled reporting. It was furthermore important to allow for slight corrections.
A particular problem consisted of finding a flexible structure making any pattern of situations and descriptions possible. For this purpose we chose a program structure allowing a roll-back to visualize previous descriptions of situations and to link current descriptions to their antecedents by a marking (see Figure 5).
In this way any subtle organization of the events is possible as well as a superposed or transposed processing and supervision of several situations at the same time. The program was finally realized in a BASIC version.
The development of a users' manual should simplify the handling of the computer and improve the quality of self-observation. The test persons are trained in a first stage of use. The accompanying manual allows a standarization of the training. Furthermore, the manual shall have a help function and provide information and support for immediate questions and operating problems.

Figure 4: Question-reply interaction for text input.

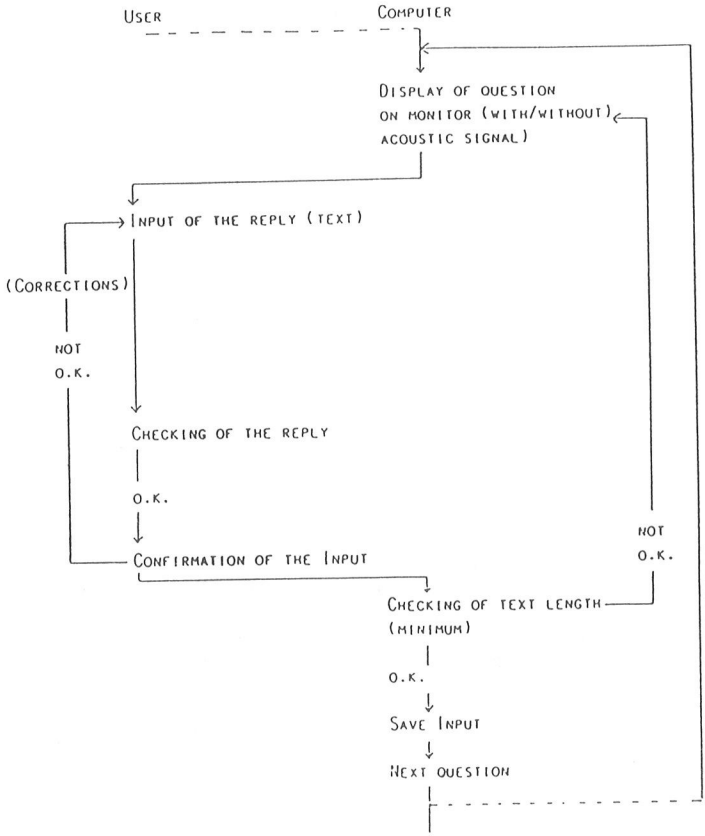
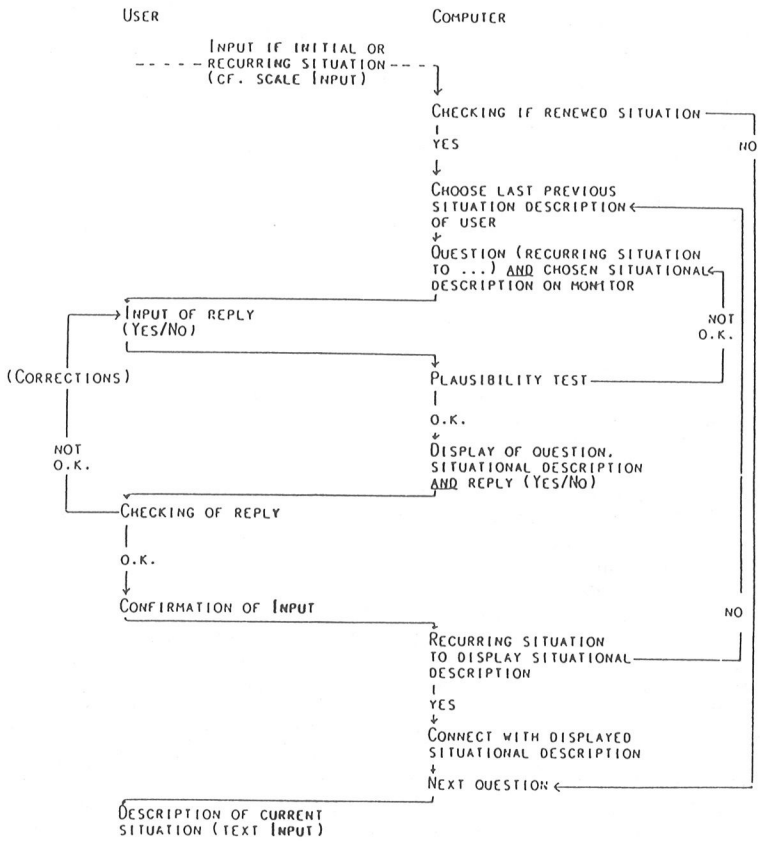


Figure 5: Question-reply interaction for connecting situations (episodes).



EXAMINATION OF THE PROCEDURE (COMES) AND STATE OF WORK

At present, the following questions are being analyzed: (1) Comparison of COMES data with questionnaire data. (2) Examination of reactivity effects. (3) Examination of the influences of "repression-sensitization" features as well as of the variable "self-attentiveness".

Ad (1): Comparison of data from different data-sources enables us to judge the validity of the method. Primarily, we relate the data obtained with the COMES to that resulting from the above-mentionned processing questionnaire (UBV) acquired with the same persons at the beginning of self-observation.

Ad (2): It cannot be excluded that a self-observation of one's own responses to psychic stress practiced for several weeks influences the observed behavior itself. The person may learn to perceive important aspects of his behavior in such situations in a more refined and discriminating way, which might

influence the structural framework in the sense of Schroder, Driver, and Streufert (1967; see also Reicherts & Pauls, 1983), and lead to an altered information processing. This question is checked by a comparison of the findings from the first stage of the observed period to those of the last stage.
Ad (3): We suppose that the quality of the self-observation is also influenced by characteristics of personality. For example, it may be that persons with a strong "sensitizer" feature (cf. also Asendorpf, Walbott & Scherer, 1983) and a strong feature of "self-attentiveness" report more stressing situations than persons with inverse features. Therefore, we also recorded these variables in the experimental stage with the test persons.
Forty students were recruited to participate in this study. They were familiarized with the procedure of self-observation and answered the following questionnaires:
- Coping with Stressing Situations in Course (UBV) by Reicherts and Perrez (1986),
- Repression-Sensitization-Scale, German version according to Krohne (1974),
- Scale of Self-Attentiveness according to Fenigstein, Scheier, and Buss, German version by Heinemann (1979),
- Social Desirability Scale (SDS) according to Crowne and Marlow, German version according to Lück and Timaeus (1969),
- State-Trait-Anxiety Inventory (STAI) by Laux, Glanzmann, Schaffner, and Spielberger (1981).
Further data were recorded for a different set of questions. The recording of the data is in its final stage. First experiences reveal that COMES is applicable. The problems in recording the data seem to correlate with the motivation of the test persons.
Evaluation occurs on two levels:
The regularity of and the correlation between stressing events and coping behavior are analyzed on an individual level with the help of the prediction analysis DEL (by Hildebrand, Laing, and Rosenthal (1977; cf. Rudinger, et al., 1985), considering among other things the hypotheses of appropriate coping (cf. Reicherts, Käslin & Perrez, 1984; Perrez, 1984; Reicherts, 1986).
Structural hypotheses--also interindividually oriented ones--can thus be evaluated either with respect to their prediction probability for certain correlations of events, or to the relationship between various characteristics in the individual case (e.g. Petermann, 1982). This procedure may also be understood as a way of checking the individual correlation with certain contextual suppositions about the characteristics of the event and of the behavior. The level of this correlation in the sense of its predictability can itself again be subject to interindividual analyses.
On the group-level, the individual information from the self-reported situations is aggregated to raw data and transposed into various scales (sums, ranks, proportions, number of stressing situations of a specific type, average valency, etc.). Besides the prediction analysis on the interindividual level, analyses of correlation and regression as well as comparisions of extreme groups are planned as statistical techniques.

PERSPECTIVES OF APPLICATION

Linked with the development of this procedure is the hope of elaborating a new methodology of self-observation in the field and rendering it useful for a theory-guided recording and analysis of coping behavior. By a further simplification of the question structure and of the operation, and by increasing the certainty in use as well as by implementing evaluation programs in the COMES-

computer itself, it should be possible to enhance the idea of "memory against stress" in its clinical application as well: With this system a personal balance of stress and of coping including criterion-oriented measurement in the field--even to comments and hints for the subject--seem to be possible.

---

*The research reported is supported by the Swiss National Science Foundation, Grant No. 1.600-0.82.

REFERENCES

Asendorpf, J.B., Walbott, H. & Scherer, K.R. (1983). Der verflixte Represser: Ein empirisch begründeter Vorschlag zu einer zweidimensionalen Operationalisierung von Repression-Sensitisation. Zeitschrift für Differentielle und Diagnostische Psychologie, 4, 113-128.

Becker, P. (1984). Bewältigungsverhalten und Psychische Gesundheit. Trierer Psychologische Berichte 11, 5.

Billings, A.G. & Moos, R.H. (1981). The Role of Coping Responses and Social Resources in Attenuating the Impact of Stressful Life Events. Journal of Behavioral Medicine, 4, 139-157.

Braukmann, W. & Filipp, S.-H. (1983). Die "Skala zur Erfassung des Bewältigungsverhaltens" (SEBV): Bericht über Aufbau, Gütekennzeichen und differentielle Zusammenhänge mit Merkmalen bedeutsamer Lebensereignisse. Forschungsbericht Nr. 27 aus dem Projekt Entwicklungspsychologie des Erwachsenenalters, Universität Trier.

Fenz, W.D. & Epstein, S. (1962). Measurement of approach-avoidance conflict along a stimulus dimension by a thematic apperception test. Journal of Personality, 30, 613-632.

Folkman, S. (1982). An Approach to the measurement of Coping. Journal of occupational Behaviour, 3, 95-107.

Folkman, S. & Lazarus, R.S. (1980). An Analysis of Coping in a Middle-Aged-Community Sample. Journal of Health and Social Behavior, 21, 219-239.

Hänggi, D. & Schedle, A. (1987). Induzierte Imagination als methodisches Paradigma zur Erfassung von Stresserleben und Stressbewältigung. Forschungsbericht Nr. 63, Psychologisches Institut der Universität Freiburg/Schweiz.

Heinemann, W. (1979). Assessment of Private and public Self-Consciousness: A German Replication. European Journal of Social Psychology, 9, 331-337.

Hildebrand, D.K., Laing, J.D. & Rosenthal, H. (1977). Prediction Analysis of Cross Classifications. New York: Wiley.

Horowitz, M.J. & Becker, S.S. (1971a). Cognitive responses to stressful stimuli. Archives of General Psychiatry, 25, 419-428.

Horowitz, M.J. & Becker, S.S. (1971b). The impulsion to repeat trauma: Experimental study of intrusive thinking after stress. Journal of Nervous and Mental Disease, 152, 32-40.

Horowitz, M.J. & Wilner, N. (1976). Stress films, emotion, and cognitive response. Archives of General Psychiatry, 33, 1339-1344.

Janke, W., Erdmann, G. & Kallus, W. (Hrsg.) (1985). Stressverarbeitungsfragebogen (SVF). Handanweisung. Göttingen: Hogrefe.

Krohne, H.W. (1974). Untersuchungen mit einer deutschen Form der Repression-Sensitisation-Skala. Zeitschrift für Klinische Psychology, 3, 238-260.

Krohne, H.W. (1984). Coping with Stress: Dispositions, Strategies, and the Problem of Measurement. Mainzer Berichte zur Persönlichkeitsforschung, Psychologisches Institut der Johannes-Gutenberg-Universität Mainz, 2.

Krohne, H.W., Wigand, A. & Kiehl, G.E. (1985). Konstruktion eines multidimensionalen Instrumentes zur Erfassung von Angstbewältigungstendenzen. In H.W. Krohne, (Hrsg.), Angstbewältigung in Leistungssituationen. Weinheim: edition psychologie (VCH), 63-77.

Lang, P.J., Levin, D.N., Miller, G.A. & Kozak, M.J. (1983). Fear Behavior, Fear Imagery, and the Psychophysiology of Emotion: The Problem of Affective Response Integration. Journal of Abnormal Psychology, 92, 276-306.

Laux, L., Glanzmann, P., Schaffner, P. & Spielberger, C.D. (1981). Das State-Trait-Angstinventar. Theoretische Grundlagen und Handanweisung. Weinheim: Beltz.

Lazarus, R.S. & Launier, R. (1981). Stressbezogene Transaktionen zwischen Person und Umwelt. In J.R. Nitsch, (Hrsg.), Stress. Theorien, Untersuchungen, Massnahmen. Bern: Huber, 213-259.

Lazarus, R.S., Speiseman, J.C., Mordkoff, A.M. & Davison, L.A. (1962). A laboratory study of psychological stress produced by a motion picture film. Psychological Monographs: General and Applied, 86(34) (Whole No. 553).

Lück, H.E. & Timaeus, E. (1969). Skalen zur Messung manifester Angst (MAS) und sozialer Wünschbarkeit (SDS-E). Diagnostica, 15, 134-141.

Mechanic, D. (1962). Students under stress. New York: Free Press.

Otto, J. (1984). Leichte körperliche Aktivierung als Paradigma der Persönlichkeitsforschung: Self-Report und physiologische Reaktionen bei verschiedenen Coping-Stilen. Mainzer Berichte zur Persönlichkeitsforschung, Psychologisches Institut der Johannes-Gutenberg-Universität Mainz, 3.

Pawlik, K. & Buse, L. (1982). Rechnergestützte Verhaltensregistrierung im Feld: Beschreibung und erste psychometrische Ueberprüfung einer neuen Erhebungsmethode. Zeitschrift für Differentielle und Diagnostische Psychologie, 3, 101-118.

Perrez, M. (1984). Stressverarbeitung bei neurotisch Depressiven. (Wie sie handeln und wie sie handeln sollten). Theorie und empirische Befunde. Forschungsbericht Nr. 50, Psychologisches Institut der Universität Freiburg/Schweiz.

Perrez, M. & Reicherts, M. Behavior and Cognition Analysis of Coping with Stress by Depressed Persons. A Criterion- and Process-Oriented Measurement Approach. In W. Huber, (Ed.), Progress in Psychotherapy Research. Louvain-La-Neuve: Presse Universitaire (in press).

Perrez, M. & Reicherts, M. (1986). Appraisal, Coping, and Attribution Processes by Depressed Persons: An S-R-S-R Approach. The German Journal of Psychology, 10, 315-326.

Petermann, F. (1982). Einzelfalldiagnose und Klinische Praxis. Stuttgart: Kohlhammer.

Reicherts, M. (1985). Kriteriumorientierte Messung in der Klinischen Psychologie: Die Entwicklung eines Tests zur Belastungsbewältigung. Zeitschrift für Klinische Psychologie, Psychopathologie und Psychotherapie, 33, 313-336.

Reicherts, M. (1986). B S - J / Bewältigung belastender Situationen bei Jugendlichen. Mehrdimensionaler situationsspezifischer S-R-Fragebogen (Forschungsversion). Forschungsbericht Nr. 62, Psychologisches Institut der Universität Freiburg/Schweiz.

Reicherts, M., Käslin, S. & Perrez, M. (1984). Stressbewältigung. Erster Arbeitsbericht der Entwicklung eines kriteriumorientierten psychodiagnostischen Verfahrens zur theoriegeleiteten Analyse sozialängstlichen und depressiven Verhaltens. Forschungsbericht Nr. 45, Psychologisches Institut der Universität Freiburg/Schweiz.

Reicherts, M. & Pauls, H. (1983). Kognitive Aspekte des Erlebens. Theoretische und empirische Untersuchungen zur Weiterführung des Wexler-Ansatzes in der klientenzentrierten Gesprächspsychotherapie. Zeitschrift für personenzentrierte Psychologie und Psychotherapie, 1, 101-118.

Reicherts, M. & Perrez, M. (1986). Fragebogen zum Umgang mit belastenden Situationen im Verlauf (UBV). Psychologisches Institut der Universität Freiburg/Schweiz.

Rudinger, G., Chaselon, F., Zimmermann, E.J. & Henning, H.J. (1985). Qualitative Daten. Neue Wege sozialwissenschaftlicher Methodik. München: Urban & Schwarzenberg.

Scherer, K.R., Wallbott, H.G., Tolkmitt, F.J. & Bergmann, G. (1985). Die Stressreaktion: Physiologie und Verhalten. Göttingen: Hogrefe.

Schroder, H.M., Driver, M.J. & Streufert, S. (1967). Human Information Processing. Individuals and Groups Functioning in Complex Social Situations. New York: Holt.

Zeitlin, S. (1980). Assessing Coping Behavior. American Journal of Orthopsychiatry, 50(1), 139-144.