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Chapter 2

Simultaneous Computer-Assisted Assessment of Causal Attribution and Social Coping in Families

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Introduction

Most computer-aided self-monitoring procedures were devised for the assessment of individual emotional or somatic states or ongoing cognitive conscious processes relevant for dysfunctional behavior (cf. de Vries, 1992; Fahrenberg & Myrtek, 1996, 2001; Wilhelm & Perrez, in press). For dyadic or family processes, ambulatory assessment methods have only recently been developed. However, an impressive volume of work has been done with a booklet-approach – without the advantages of micro-computers – by Larson and Richards (1994). They studied fifty-five families with adolescents using the experience sampling method. The main emphasis of the authors was a representative sample of the experiences in families with adolescents for studying the common and divergent realities they encounter. An electronic pager carried by all members of the family simultaneously beeps at eight random times per day over a week. At these moments the subjects had to complete a page in the booklet in order to observe their daily family experience. We have proposed a conceptual basis (Perrez, Berger & Wilhelm, 1998) to assess social regulation of emotions in couples and families in natural settings. An initial aim focuses on the emotional states in daily life of parents and adolescents. How do they evolve throughout the day and over the week for parents and adolescents ? How do parents perceive their own emotional states and those of the partner? A second aim refers to stress emotions. The framework distinguishes between the experienced stressful events in couples and families according to the different possible disturbances of equilibria, namely the equilibrium of individual family members (individual stress), the equilibrium of a subsystem of the family, or of the entire family system (see Table 1). Another aspect consists of how an individual, a subsystem or indeed the whole family react to stress emotions of an individual, a subsystem or to the family as a whole.

We assume that essential components of the social regulation of emotions are characteristics of appraisal and perception processes (or tendencies) of the actors. As variables, important for stress experience and coping ,involving appraisal and interpersonal perception, we focus on valence (positive and negative), controllability, causal attribution, and the accuracy of decoding the partners' emotions. One

Table 1. Matrix of equilibria and coping disturbances

Adaptive reactions (dysfunctional or functional) disturbance of equilibrium	❶ Father	❷ Mother	❸ Child	❹ Sub-system from 1 to 3	❺ Family
❶ Father	*intra-individual*	dyadic	dyadic	Sub-system involved episode	Family involved episode
❷ Mother	dyadic	*intra-individual*	dyadic		
❸ Child	dyadic	dyadic	*intra-individual*		
❹ Subsystem from 1 to 3	Subsystem involved episode				
❺ Family	Family involved episode				

ty, causal attribution, and the accuracy of decoding the partners' emotions. One aspect of interest is if tendencies in these variables can be identified, which are typical for specific situations, for specific activities with respect to gender and generation. A second aspect concerns emotional and somatic states (positive and negative). They are assumed to be related to cognitive and appraisal process in a theoretically predictable way (Lazarus, 1991; Scherer, 1988). A third question consists of the social effects of causal attributions, if they are ascribed to other members of the family (for couples see Fincham, Harold & Gano-Phillips, 2000). A fourth aspect consists of the adaptive coping responses (individual or social). We assume that functional and dysfunctional individual and social coping reactions can be distinguished from each other. For the *individual* forms we built on the idea, that the functionality or the adequacy of coping responses depend on the fitting of the response with the demands of the coping-task (Reicherts & Perrez, 1992; Reicherts, 1999). For the *social* forms we refer to a taxonomy, that essentially covers the criteria of self-esteem and the system-internal (adaptation to the stressor) versus system-external adaptation (reaction is intended to alter the stressor).

We formulated hypotheses about the relationship of specific attributions patterns with emotional states, as well as for the social effects of specific attributions. For the social coping we expect that the interaction patterns considered to be functional are related in the *short term* to better emotional and social well being (state) of the actor and the actor's partner, and in the *mean term* lead to better individual well being (trait), at the subsystem level to greater partner satisfaction and at the family level to greater cohesion and family satisfaction.

The behavioral analysis of social regulation of emotions should record such processes and identify how far the emotional states can be explained by attribution and social coping tendencies. Such knowledge is of theoretical interest for basic research as well as for the dyadic behavior analysis being a first step in therapy to prepare intervention programs.

In the following paragraphs we describe and summarize the work of the Fribourg research group over the last years, in which several Ph.D. and undergraduate students were involved.

How to assess such intra-individual and interaction patterns under natural conditions?

The microanalysis of the social regulation of emotions needs four types of psychological information corresponding to the temporal structure of the events involved. These are (i) information on antecedents of emotions (such as causal attributions, controllability and interpersonal perception features, co-occurring features such as setting, activity), (ii) information on emotional and somatic states, (iii) on individual and social (adaptive and maladaptive) responses, and (iv) on the individual and social short term effects.

The usual access to such information consists in the use of questionnaires which focus on the variables of interest. Typical, and especially retrospective self-report data, mirror the subjects' cognitive representation of their behavior, emotion and cognition and not how they behaved, felt and thought in particular situations; the same is valid for the estimation of frequencies of behaviors, emotions and cognitions. This assessment approach may be useful and valid for the observation and measurement of the cognitive representation of the subjects' experiences. However if it is not cognitive representations of behavior, of emotional experiences and cognitive activities, but behavioral, emotional and cognitive activities that are our object of study, we need other methods than traditional questionnaires (Wilhelm & Perrez, in press). In order to avoid the impairing effects on validity of usual self-report data, we need assessment strategies which meet the three following criteria: (i) The procedure should allow assessing the above mentioned information in daily life under the social and environmental conditions in which these states and events occur. (ii) The time lag between the experienced states and behavior and their recording should be as short as possible, to minimize memory distortions. Information should be recorded when the subjects are still in the state of emotional arousal for storing "hot emotions" and "hot cognition". (iii) The method should assess psychological relevant data, not using a diary style free text self description, but structured according to the theoretical framework.

To accomplish this aim we have in recent years developed a systematic self observation method based on the use of pocket computers. Our assessment procedure has its root in the experience of the COMRES (COMputer Recording System), that

Table 2. FASEM-C information types and item formats

Information type	Item types
1. Duration and quality of sleep (1st observation of the day)	5 Items (6- and 7-point scales)
2. Emotional and somatic state	11 (6-point scales)
3. Causal attribution • internal or external attribution • other persons	9 Items (3-point scales) 9 Items (3-point scales)
4. Control expectation • by myself or by other persons • which other persons	(triggered by 2.) 10 Items (3-point scales)
5. Somatic complaints / pain • Attribution	10 Items (3-point scales) 13 Items (categories)
6. Place	6 Categories
7. Setting • presence of other persons • evaluation of pleasantness	14 Items (categories) 9 Items (categories) 1 Item (4-point scale)
8. Evaluation of partner's affective state (only for parents)	8 Items (categories and 6-point scales)
9. actual activity • valence of activity • consumption of drugs	16 Items (categories) 2 Items (6-point scales) 7 Items (categories)
10. Conflicts with others Social coping • description of own behavior • description of other's behavior	Yes/No, triggers: 3 Items (3-point scales) 12 Items (3-point scales) 12 Items (3-point scales)
11. Individual stress 12. Individual coping	2 Items (category and 3-point scale) (triggered by 11.) 12 Items (3-point scales)
13. Social support • by whom?	Yes/No, triggers: 4 Items (categories)
14. Evaluation of own and other's behavior	triggered by 13. 2 Items (6-point scales)

Perrez and Reicherts (1996) developed and evaluated in earlier projects on recording individual stress experiences and coping with them. The pocket computer is used as an external memory for stress, that is applied directly in daily stressful situations. This allows minimizing problems of memory and the consequent subjective retrospective distortion.

The purpose is to have access to the emotional life of families, including positive emotional and somatic states as well as negatives. The new approach had not only to integrate a broader range of emotional states; it had in addition to involve the social contingencies of an individual's emotional state in the form of the behavior of other family actors present. With this aim in mind the event-sampling method, for the assessment of individual stress experience and coping, was adapted to a time-sampling instrument to assess positive or negative emotional states, related cognitive activities and the social regulative activities of emotions from all members of the family simultaneously.

What is self-recorded?
The method is devised for couples and families with adolescents. Table 2 summarizes the different information types and item formats assessed by the family-self-monitoring system (FASEM-C).

Experience and behavior sampling
The social interconnection of the behavior experience assessed, to the behavior of other family members plays a major role for the analysis of the social regulation of emotions. A time sampling strategy is therefore indispensable. The system works with such a method with one exception: In order to avoid waking up the subjects for the first self-observation of the day, the user of FASEM-C start their first recording after getting up in the morning. For the other five measurement points the computer alerts the subject acoustically according to a random time point inside a time window of roughly three hours, five times per day for a weekly period. At these measurement points all subjects had to record their current emotional and somatic state and the other information mentioned above including information on stressful individual or social events and coping with respect to the period between the previous recording and the present moment. The question-program is in some ways adaptive. The presentation of several questions depend on previous answers; for example, if the question "Do you feel any pain or physical complaints?" is answered with "yes", one has to answer supplementary menus. The signal contingent assessment assures the simultaneous recording of all members of the family or couple (older than 13 years). In the same way social support and coping reactions are assessed. Coping responses are only asked if an individual or a social stressful situation has been previously noted. Questions on social coping depend on the involvement of other people in the situation (for example, conflicts). For situations, requiring adaptation without social involvement, individual coping items are presented. Furthermore the program only presents questions concerning control expectations, if a negative emotional state has been recorded.

Technical aspects

The palmtop computer chosen for our studies was the HP 360 LX based on the windows CE operating system. It has a pencil pointing device, a complete Qwerty and touch screen with a resolution of 640 * 240. Data entry was done almost exclusively using the pointing device with the keyboard being only of marginal utility. These characteristics make it possible to carry it during everyday activities and allow the immediate entry of information in a structured format.

Use of a computer has several advantages: it allows the questionnaire to be personalized for each family, using the individual first names of the family members. It also allow a control of user input making it impossible that a user misses completely or incorrectly fills in a question as sometimes occurred in the booklet versions. It also hides some of the questionnaire's complexity from a user as questions that do not apply are not asked and it minimizes reactivity in that once the question displayed is answered no backtracking to a previous question is possible.

Our program separates the questionnaire interpreter from the questionnaire specification. This allows preparation of the questionnaire without any knowledge of computer programming. It also allows easy adaptation to different languages, which is important in Switzerland, with several official languages. Versions in French, German and Portuguese have been tested.

Method

Description of the sample

The data reported here, was gathered in the context of an interdisciplinary project supported by the Swiss National Foundation (see Perrez, Schoebi & Wilhelm, 2000).

For the selection of the families we used the following criteria: Each family should consist of both parents and at least one adolescent between 14 and 17 years, living together in the same household. We also made sure that the self-observation took place during a normal family week and not during holidays or when the family is travelling.

We recruited families with the help of the German and French-speaking school secondary school administrations of canton Fribourg and by using the town population census, (information freely available to the public). A letter was written to each family (about 5200), informing about the purpose of our study and inviting the family to participate.

Interested families sent back a coupon, signed by each participating family member. 101 two-parent-families were willing to participate. Two families cancelled their participation before starting. One stopped the participation because of computer problems. One family was from the Balkans and was dropped from data analysis because the mother had language problems.

The following results are based on 96 families with 314 persons (96 mothers, 96 fathers, 56 female and 66 male adolescents). 40 families were French-speaking the other 56 were German speaking. The average parent was 46.13 years old (SD =

5.86), and the adolescents/young adults 15.45 years (SD = 1.12). Most families belong to the middle class with a comparably high educational level.

Additional questionnaires

In addition, the subjects answered several questionnaires:

Relationship Assessment Scale (Hendrick, 1988; Sander & Böcker, 1993), Family Life Satisfaction Scale (cohesion, adaptation, communication and family satisfaction) (Schneewind & Weiss, 1999), Frankfurter Selbstkonzeptskalen (Deusinger, 1986), Socio-demographic variables and further scales not relevant for the current paper were given. All scales were translated to French and back translated into the original version.

Procedure

Data acquisition took place from November 1998 to April 2000. The interviewer visited the family at home. The participants were given a first introductory training in self-observation with the help of the pocket computer. In addition, the subjects answered the questionnaires. For motivational reasons, the adolescent participants received a coupon for a CD with a value of about 30.- SFr at the end of their self-monitoring task. All families took part on a raffle for a holiday prize with a value of about 3500.- SFr, and they could ask for feedback on their results.

Results with respect to methodological criteria

Acceptance, Accuracy and Duration of recording

All subjects were questioned after the self-observation week about their experience with the assessment method. For most of the participants the duration of the recording task was acceptable (76 %), and nearly all participants (94 %) judged the work with the pocket computer as positive. These results are in accordance with the experience of the first study and belies the expectation, that ambulatory computer-aided self-monitoring disturb participants as suggested by Asendorpf and Wilpers (1999).

The palmtop computer automatically stores the real recording time and the duration of every assessment. This allows strong control on the subject's accuracy and commitment. More than 60 percent of the subjects have been started within five minutes after the signal. 75–80 % of the subjects completed their self-monitoring task within a 30 minutes time-limit.

Concerning the duration, the time is depending on the question, whether more detailed information was asked or not in function of the previous answers. For the shortest version the mean needed time for the protocol was 4.65 min (SD = 2.89) and for the complete version 7.28 minutes per protocol (S.D = 3.82).

Reliability

In the context of self-observation methods there are different possibilities of esti-

mating the reliability of measures (Buse & Pawlik, 1996, Wilhelm & Perrez, in press): The local reliability, the total aggregate reliability and situation-specific-reliability and for simultaneous observations the inter rater reliability. Table 3 summarizes some results on psychometric properties, and we refer to Perrez, Schoebi and Wilhelm (2000) for more detailed results.

Table 3. Reliability coefficients

Local reliability	
(Cronbach's alpha for the state-items) computed for each of the 42 observations	
Emotional state	.92 to .95 (Mdn = .935)
Somatic state	.46 to .81 (Mdn = .708)
Total-aggregate reliability (odd-even over the 42 observations)	
Emotional state	r= .98
Somatic state	r= .98
Variability (split half)	
Emotional state	r= .85
Somatic state	r= .86

To compute the total-aggregate-reliability the 42 observations were divided into two samples according to the odd-even-method. To calculate the average split-half-reliability for the items belonging to a question, the coefficients were subjected to a Fischer's-z-transformation. The odd-even reliability coefficients for other self-observation categories vary between .34 and .98 with a mean of .69. If the values of strongly situation-dependent items, which are triggered by previous answers (and have therefore a low frequency) are eliminated, the mean is .80. This average total-aggregate-reliability is quite high. For the average emotional state as well as for the average somatic state the total aggregate reliability was r = .98, for bodily complaints (answering the question "Do you feel any pain or do you have any physical complaints in the moment?" with yes or no) it was r = .97, for feeling hungry it was r =.91 and for the evaluation of the activity as pleasant or unpleasant it was r = . 89.

Reactivity

On one hand the reactivity question can be considered as the core question for a self-monitoring procedure – comparable to the memory problem for retrospective assessment methods – , on the other hand it should not be forgotten as Fahrenberg (1994) emphasized, that methodologically conditioned reactivity is a feature of (nearly) all psychological measurement methods. In any case we should know the extent of the influence. We have some objective and some subjective indicators for the question how far FASEM-C has itself an influence on the observed phenomena. If the same questions are asked six times a day over the course of a week, it is probable that the procedure will have learning, fatigue or sensitivity effects. For

these analyses we refer to Perrez, Schoebi and Wilhelm (2000). Their results show that over the course of the observation people learn how to use the observational system in a more economic way: They tend to avoid answering questions that are followed by more detailed questions. They also tend to protocol their emotional state in a more stereotype way. This results in a slight increase of the emotional state score. However, even if the effects are statistically significant, the effects are rather small.

Another indicator for reactivity is the subjective estimation of the persons concerning the experienced influence of the assessment procedure. The participants were asked after their self-observation period to what extent the self-monitoring influenced family life, professional activity and their affective states. 57 % answered that the self-observation had no impact on family life, respect. 74 % on professional activity; 36 % estimated a little influence.

With respect to the effects on their affective state, 62 % could not observe any effect, and 33 % a little effect, and for the remainder it was experienced as stronger.

The role of causal attributions for the individual and social regulation of emotion in the family

The self-monitoring study tries to identify cognitive regulation mechanisms, which influence the individual and social regulation of emotion within the family. Causal attributions are supposed to be prominent antecedents and consequences of emotions. Their dimensions (for example, causal locus, controllability) should influence the quality of the emotions (cf. Weiner, 1986; Scherer, 1988), and the quality of emotions may influence the type of attribution. Many studies have been done on the relationship of appraisal components as defined by Lazarus (1991) with specific emotions; less attention has been paid to the role of causal attribution. Lazarus and Smith (1988) and Smith, Haynes, Lazarus and Pope (1993) distinguished two types of cognitive implications: knowledge and appraisal; the latter evaluates the significance of stressors for one's personal wellbeing. The present study focuses on *causal attribution as antecedent and consequence* of emotional states, which is considered as an element of appraisal processes (deviating from the distinction of Lazarus and Smith, 1988). We analyze particularly the self-protective function of internal vs. external causal attributions in positive and negative states and the multi-causality in negative states. A second goal concerns the *social effects of attributions*. How are the attributions toward the family members, and what are the effects? Karney and Bradbury (2000) observed the effects of attributions on marital satisfaction in a longitudinal study. Studies dealing with the connection of children's attribution with features of the relationship in the family can be located in the same context (for example, Fincham, Beach, Arias & Brody, 1998). Our objective is to observe causal attributions and their social consequences in the natural family setting.

For the *assessment* of causal attributions FASEM-C asks family members in every situation, why they feel the way they feel. As causes could be selected oneself, other family members, other persons, and impersonal external circumstances. Answers are rated on a 3-point scale indicating their importance. The specification of the variables "internal attribution", "external attribution", "external attribution addressed to a member of the family", or "external attributions addressed to a person outside the family" was determined by the selection of the answer with the most intensive value, if more than one answer was given. If the subject select more than one cause, then a multi-causal, more complex explanation for the current state is present.

Causal attributions are analysed *(1)* as emotion-consequences by comparing the attributions with respect to positive and negative emotional states, emotional states will be *(2)* examined as antecedents of consecutive emotional states, and *(3)* the social aspects and effects of causal attributions in dyadic situations will be observed.

"Emotional state" consists of a score based on eight bipolar items that create a consistent factor and show high reliability (Perrez, Schoebi & Wilhelm, 2000). Because negative emotional states were rather rare and a large part of the sample only reported one or two negative emotional states, we preferred to take the first positive resp. negative situation reported instead of an aggregation of the data.

Results on causal attributions

The *self-protective function* of causal attributions is suggested by the fact that the subjects explained their *negative* emotional states more intensively by external causes (M=2.27, SD=.99) than by internal (M=1.23, SD=1.20), and they attribute more intensively internal causes for *positive* emotional states (ANOVA: causal attribution x emotional state: $F_{(1, 167)}$=33.39, p=.000, eta^2=.17, n=168). In the previous study the percentage of mono-causal internal explanation was significantly higher for good mood states than for bad ones; and mono-causal external explanations were inversely more frequent for bad mood than for good mood (Perrez & Wilhelm, 2000).

The role of *multi-causality of causal explanations:* For every explanation of an emotional state the subject can use one or several causes for explaining his or her state. The variable "multi-causality" is defined by the number of causes used to explain the state. We can observe that negative emotional states are followed by more complex explanations compared with positive emotional states (M_{neg} = 2.70, SD = 2.21 vs M_{pos} = 2.20, SD = 2.14, $t_{(166)}$ = 3.93, p = .000, d = .30). Human beings seem to have a stronger need to explore the possible causes for negative states than for positive. Weiner (1986) noticed that the subjects produce spontaneously attributions when the events are unexpected or the goal non-attained. Positive emotional states and moods are experienced as a matter of course, whereas negative states demand explanation, and the explanation may have an self-reassuring and calming effect.

This need to explore causes seems to be influenced by traits: multi-causality is correlated with indicators of "neuroticism", in particular with lower self-esteem (r = -.24, p =. 002, n = 172), more psychosomatic symptoms (r =. 17, p = .02, n =

172) and higher depressive scores (r = . 15, p = .04, n = 172). These are rather small effects, that reach significance only when we treat family members as independent individuals.

Emotional states tend to be followed by different causal attributions according to the valence of the emotion, if subjects are asked for explanation, and according to personality traits.

This self-protecting phenomenon is in some way confirmed by the short term effects; the causal attributions are here taken into account as *antecedents of emotions.* Because external attributions with respect to negative emotional state are more likely to maintain the self-esteem, they should be more prone to change the mood in a positive direction than internal attributions. We predicted as a short term-effect that positive mood swing between the previous observation t_0 and the following observation t_1 will be larger, if the person attributes external attributions at observation t_0, and it will be lower, if it reports an internal attribution. The intra-personal comparison showed in the previous study (Perrez & Wilhelm, 2000), and in the present, that after external attributions the positive emotional state is significantly larger than after internal (M_{ext}= 3.93, SD= .81 *vs* M_{int} = 3.63, SD = 1.13, $t_{(30)}$= 1.69, p = .05 (one tailed) d= .30). This difference is not due to differences in the emotional state at observation t_0.

Social aspects of attributions: To what extent do family members attribute their positive and their negative emotional states to other members of the family? We compared the intensity of the causal attributions during positive and negative emotional states (Wilcoxon, two-tailed). Family members report other members of the family more intensively as the cause for *negative* states than for positive emotional states (Z = 5.46, p< .001, n = 168). These findings confirm the results of the previous study (Horner, Perrez, Berger, Wilhelm & Schoebi, 2000).

The adolescents tend to explain *positive* emotional states as in the previous project more with causes attributed to persons outside the family than inside (Z = 5.91, p< .001, n = 119), which underlines the important role of peers for adolescents. They spent significantly more time with persons not belonging to the family than their parents. The adolescents met friends in settings outside the school and home in 61 % of the observations; parents record meeting friends in 30 % of their observations outside work place and home.

Interpersonal effects of causal attributions: We assumed that an external attribution should have an influence on the addressee, especially if negative emotions are at stake. Therefore, we compared the emotional state of B, if subject A attributes the causes for his or her negative emotional state to B (t test with dependent samples), with his or her state in the cases when A *does not* attribute the causes for his or her negative emotional state to B. The within-comparison of the emotional states (as addressee or as non-addressee of the causal attribution for the negative state of the partner) is based on situations in which both persons are present.

The analysis confirmed our expectations. If the father attributes his negative emotional state to the mother, her emotional state is significantly worse than if he

doesn't make her responsible for his negative state. The same tendency can be observed if sons and daughters are the targets of the father's attributions (see table 4). The observed effect sizes are comparable, but do not reach significance due to the small sample sizes.

If we have a look to the mothers' attribution, similar effects can be observed. None of the adolescents' attributions had a significant effect on their parents' emotional state, but at least for the mother, they follow the same general trend. Larger samples would be required to confirm the rather small effects.

In the previous study the effects were strongest for fathers, according to the power location in the family, then for mothers, and finally for the female adolescents. The latter's attribution were associated with the mother's emotional state (Horner, Perrez, Berger, Wilhelm & Schoebi, 2000; and Horner, in preparation).

The results confirm findings of the previous study (Horner, Perrez, Berger, Wilhelm & Schoebi, 2000; Perrez & Wilhelm, 2000; Wilhelm, Horner & Perrez, 2000).

Table 4. Matrix of the differences of emotional states in association of father's and mother's attributions

	Father	Mother	Son	Daughter
Father		d=.25, p=.06, n=37	d=.22, p=ns, n=12	d=.22, p=ns, n=12
Mother	d=.29, p=.03 n=44		d=.29, p=.08 n=24	d=.12, p=ns n=28

Social coping in families

In the German speaking area, social coping in families was discussed by Laux and Schütz (1996) and by the Fribourg group (Perrez, Berger & Wilhelm, 1998). Bodenmann's (1995, 2000) contributions deal with the dyadic coping as a special case of social coping.

We define *social coping* as social behavior of a person A which intends to reduce stress-emotions. The stress-emotions can affect the person A itself, and A tries for example, to reduce stress by asking person B for help. They can also affect actor B, and A tries to help B to solve his or her emotional distress; or both actors are involved in a same stressful encounter, for example, in a conflict or in the common loss of a loved person.

We define a social coping response as *functional*, if it is favorable to one's self-esteem or, at least, does not impair the self-esteem of the persons who are involved in the stressful encounter. Impairing responses are qualified as *dysfunctional*. We consider for example, the category "give way against the own will" as dysfunctional accommodation. Examples for functional social coping are: "Negotiating", "con-

vincing" (assimilative social coping), "accepting the opinion of the other" (accommodative social coping).

The *assessment of the social coping* with FASEM-C consists first of the question if the subject was involved in a problem with somebody else since the last observation point (about 3 hours). In the affirmative the person has to record first the behavior of the conflict partner and then his or her own social coping behavior using 12 three-point scales (the items correspond to the responses, listed in table 5). This procedure enables assessing information on the self-perception and the interpersonal perception of the social coping.

Table 5: Functional and dysfunctional social coping responses

Functional social coping responses	Dysfunctional social coping responses
Negotiating	Reproaching
Support/trying to understand	Obeying against the own will
Accepting the other's intention	Devaluing others/not taking the other seriously
Taking in good humor	Concealing his feelings
Convincing	Avoiding contact/fleeing the partner
Declaring oneself	Covering negative feelings*

Note: * This category has not been recorded.

Dependency of social coping from situations

The question which type of social coping responses is favored by persons presumably does not only depend on personal styles, but depends also on features of the situation. In the field of emotion research, Ekman knew already in the sixties that emotions are impressively influenced by social situations. He called the phenomenon "display rules of emotions" (Ekman, 1972). Analogous influences can be suspected for social coping. We expect more dysfunctional social coping responses, if they are addressed to family members than if they focus on persons outside the family. The family facilitates not only the expression of negative emotions, but also of dysfunctional social behavior as a comparably tolerant environment for deviation. We expect this difference in both the recording of own and other's behavior.

The following results based on a subsample of the initial 96 families. 213 subjects of a total of 314 persons reported more than two conflict situations within the observation period and were therefore included. Subjects with less than three conflict reports were excluded for reasons of feasibility of the intended analyses. This sample of 213 persons (out of 67 families) reported a total of 853 conflicts. In 10 of these situations family members as well as persons from outside the family were involved in the stressful encounter. They were excluded from the comparison. The

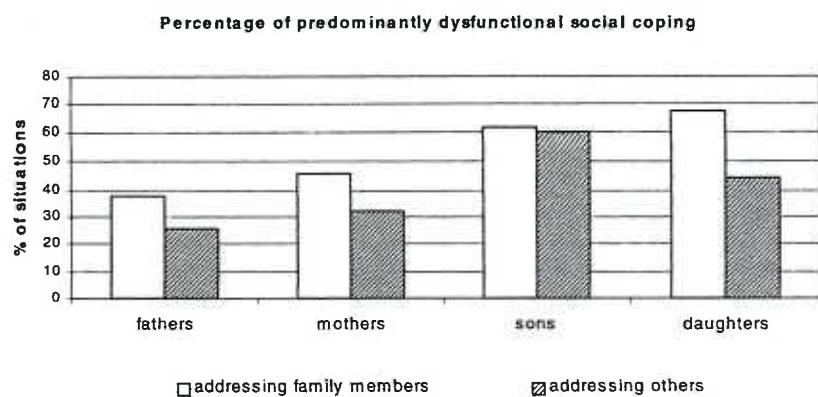**Percentage of predominantly dysfunctional social coping**

Figure 1. Dysfunctional social coping towards family members and others

database for the analysis finally included data of 58 fathers (157 conflict situations with family members and 51 with others), 63 mothers (255 vs. 31), 45 sons (106 vs. 55) and 47 daughters (138 vs. 50). The percentage of situations with predominantly dysfunctional social coping has been calculated for each individual separately for conflicts with family members and conflicts with others. Figure 1 illustrates the means of the individual percentages according to the addressees:

The results concerning the perceived coping behavior of the conflict partner show congruent patterns, as illustrated in Table 6.

Table 6. Distribution of predominantly dysfunctional coping responses of the conflict partners

Recorded by	Predominantly dysfunctional social coping by	
	Family members	others
Fathers	46.5%	37.3%
Mothers	54.5%	45.2%
Sons	61.3%	76.4%
Daughters	68.1%	56,0%

To test the descriptive results, reported above, within subject comparison would be most appropriate. Therefore, the sample described above was further restricted to persons who reported at least one conflict situation with family members *and* another with others.

98 persons out of 67 families (26 fathers, 21 mothers, 24 sons and 27 daughters) remained for the analysis. The within-comparison (Wilcoxon-test) shows a significant difference (p=.021) as expected. This is in accordance with an alternative analysis of the same data (Perrez & Schoebi, in press) and with the results of a previous study (Wilhelm, Horner & Perrez, 2000), where subjects recorded significantly more dysfunctional coping responses with family members. The within-

comparison for the subsamples (fathers, mothers, sons and daughters) indicate tendencies (p ranges between .052 and .081) in the same direction, except for the sons.

For the reported social coping responses observed by conflict partners, the differences do not reach the level of significance if analyzed over the whole sample, but show a comparable pattern. The sons differ from the general pattern found for the other family members. They record a rather equal distribution of their own functional and dysfunctional behavior and their reports on the other's behavior even contradict the general tendency.

Discussion

The above described computer-aided self-monitoring system for couples and families with adolescents has proven it's *applicability* in normal families and in selected cases of families with patients (anorexia) (Rach, 1998). In all cases it requires motivated couples or families. With this prerequisite the drop out rates are surprisingly low. Families who decide to participate showed, in general, a reliable commitment. Most of the participants accepted the self-monitoring task with the help of the pocket computer, even if there were sometimes technical problems to solve, especially with the energy supply of the computers. The results on *reliability* are satisfactory. For some predominantly situations-specific variables we found, as we expected, lower aggregate reliability coefficients. The *reactivity* of this assessment procedure is significant, but small. For our method, we assume a strong *ecological validity*, because in contrast to laboratory or questionnaire methods, behavioral and mood data are gathered in the context and under the conditions under which behavior and emotional states usually occur.

The advantages of this assessment procedure are evident for the purpose of data collection on psychological and social processes, on "hot cognition" and "hot emotions" in daily life. The traditional questionnaire methods usually assess rather the subject's cognitive representation of his or her emotions, cognitions and behaviors than properties of theses psychological phenomena. The described method requires that the phenomena assessed are conscious to the subject. Some developments can be observed in the context of psychotherapeutic intervention (cf. Wilhelm & Perrez, in press) for individual therapies. FASEM-C is opening new ways for the behavior and cognition analyzes of couples and families. This new procedure of analyzing the individual and social regulation of emotion may be helpful in the future for the planing of therapeutic intervention for couples and families. The *clinical importance* consists – compared with traditional methods – of a more appropriate assessment of psychological phenomena. The direct observation of actual behavior, emotional states, and cognition fits better the theoretical assumptions on functional relationships between cognitive or other antecedents and their behavioral consequences. The advantage of reliable self-monitoring consists in information on behavior, recorded in daily life close to the events. Using FASEM-C, dysfunctional

social patterns and their intra-personal cognitive antecedents can be discovered. The utility is not restricted to the functional analysis; it also concerns the assessment of base-line and follow-up data for treatment evaluation.

The results show with regard to the connection of causal attributions with emotional states promising relationships. The importance of causal attributions as antecedents of emotional states is confirmed on a correlation-level; and on the other hand emotional states are revealed as predictors of causal attributions. The self-protecting function of external causal attributions and the social effects by the addressees inside the family have been replicated in the new data. They also confirm the self-serving biases, as has been observed by Laux and Schütz (1996) and Schütz (1999) with respect to the attributions for one's own and spouse's behavior in conflicts. The results do not contribute to the distinction of attributions and appraisals, as Smith, Haynes, Lazarus and Pope (1993) proposed.

The confirmation of the results of the previous FASEM-study is furthermore true for the analyses of the social regulation of emotions. It seems to exist what could be termed "display rules for social coping" by analogy to the display rules for emotions (Ekman, 1972). Functional social modalities of emotion regulation happen easier during exchange with persons not belonging to the family than with family members, and for dysfunctional modalities the inverse is true.

With respect to the limits of conventional statistic computing of serial data as they are generated by FASEM-C, we emphasize that they can be helpful for clarifying very specific and limited questions such as, if dysfunctional coping is more often addressed to family members than to others, or if one type of causal attribution to explain a stressor is more associated with some specific emotional states than with others. However, these analyses are confronted with the problem of the multiple dependency of the data. The data can be referenced to different levels: to subjects, to families, to time points, etc. Conventional methods focus on *one* level (cf. Schallberger, 2000). In this chapter we reported results, that are based on standard statistical methods (mostly paired sample t-test or Wilcoxon-test). These tests are well known and the results are easy to communicate. For most of the analyses we collapsed the data over the repeated observations a person reported in two (or more) different types of situations, and then we computed within subject comparisons on the base of such aggregated scores. One problem of that strategy is that the persons who did not report self-observations data in every situation, which is going to be analyzed, had to be dropped. This leads to a reduction of statistical power to detect effects and complicates the generalization of the results.

In family data a second source of dependence is between subjects, because family members are more similar to each other than random sampled individuals. To take care of a second source of dependence is quite complicated in standard statistical analysis (for example, Wilhelm, Horner & Perrez, 2000). In this chapter some of the analyses ignore family membership and treat subjects as independent units. These significance tests are in danger of being to liberal. One way to protect against such an inflation of the alpha error is to check if the results are still significant if one cor-

rects degrees of freedom. The right correction has to take the amount of similarity between family members into account, that can be measured as an intra-class correlation (Kenny, Kashy & Bolger, 1998). A crude and conservative, but easy way to check whether the significance test holds, is to look if a result is still significant after the degrees of freedom have been reduced from the number of individuals to the number of families involved into the analysis (minus the corrective for number of parameters estimated). Applying this check to the results reported here, reveals that significance holds even under that condition.

Wilhelm gives in a separate chapter an example of how the problems discussed here can be solved alternatively by applying multilevel analysis to the family self observation data.

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