

# Individual Differences in Anger and Sadness: In Pursuit of Active Situational Features and Psychological Processes

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**ABSTRACT** In the cognitive–affective personality system (CAPS) theory of Mischel and Shoda (1995, 1998), personality is conceived as a system of cognitions and affects that mediates between active situational features and behavior. Two major tasks for this approach to personality are the search for active situational features and for mediating psychological processes within a behavioral domain of interest. We report two studies to address these tasks for the domain of anger and sadness. To design these studies and to analyze the obtained data, novel extensions of our previous developed Triple Typology Model (TTM; Vansteelandt & Van Mechelen, 1998) are proposed. These extensions allow the researcher to test hypotheses concerning potentially relevant active situational features in a systematic and confirmatory way and to examine psychological processes as they occur in concrete situations.

In the Cognitive–Affective Personality System (CAPS) theory of Mischel and Shoda (1995, 1998), personality is conceived as a system of cognitions and affects that mediates between situations and behavioral responses. According to this theory, features of a situation activate several cognitions and affects—including encodings, expectancies,

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values, and/or competencies. Subsequently, these cognitions and affects activate or inhibit other cognitions and affects, and, finally, the total activation of the cognitive–affective personality system results in the displaying (or not displaying) of certain behaviors. Individual differences in behavior are assumed to be the result of individual differences in the way information from the situation is processed and transformed by the CAPS (Mischel & Shoda, 1995, 1998).

A first important task for CAPS theory is to discover which active situational features are relevant for a behavioral domain of interest (Shoda, Mischel, & Wright, 1994), active features being those features of the situation that render a meaning to it (Higgins, 1990) or that have an impact on behavior (Shoda et al., 1994). A second important task for CAPS theory is to uncover the psychological processes underlying individual differences in situation–behavior profiles; the latter comes down to revealing the mediating mechanisms in the CAPS or, in Mischel and Shoda’s terms (1995, 1998), to finding the cognitive–affective domain map of a particular behavioral domain.

The twofold aim of CAPS theory implies a considerable methodological challenge. In this article, we want to tackle both problems for the domain of anger and sadness. To accomplish this task, we will present a new methodology that builds further on earlier work (Vansteelandt & Van Mechelen, 1998) in which a Triple Typology Model (TTM) was proposed. Starting from empirical data that indicate which persons display which responses in which situations, the TTM methodology allows the researcher to group persons, situations, and responses into a limited number of (hierarchically organized and mutually exclusive) person, situation, and response classes; subsequently, each person class (or type) is characterized by a set of “if (situation class)–then (response class) rules” that define its behavioral signature.

This TTM is a categorical and deterministic model, the different classes of which are monothetic categories. The latter means, for example, that all persons who belong to the same person class are assumed to display exactly the same set of behaviors in each situation. A similar statement holds for both the situation classes and the behavior classes. The if (situation class)–then (behavior class) rules are also assumed to be deterministic in nature. In the analysis of real data, however, parsimonious models with a less than perfect fit to the data are preferred over complex, perfectly fitting models. For the TTM, a less than perfect fit implies that each class is turned into a fuzzy category

with members that vary in prototypicality (Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976); it also results in probabilistic rather than deterministic if-then rules, with the probability for a person to perform a behavior in a situation being higher for more prototypical persons, situations, and behaviors (see also Wright & Mischel, 1987).

In its original form, the TTM methodology suffers from two basic limitations: First, the methodology is limited to exploratory research in which the researcher wants to induce active psychological features from the data; as such, the original TTM is not suited to test a priori hypotheses about active situational features that are derived from theoretical insights or from earlier empirical research. Second, with respect to the underlying psychological processes, the TTM in its original form only leaves room for dispositional, context-free, process variables; however, psychological processes always occur in a concrete, situational context, and it may be desirable to examine them as such. In addition, for a behavioral domain of interest, the CAPS may comprise both universal and person type-specific processes; to fully understand the system, we need a methodology that allows the researcher to discover both kinds of processes. In the present article, we will propose novel extensions of the TTM methodology to remedy these shortcomings. Although the methodology is generally applicable, we will apply it here to the domain of anger and sadness.

The structure of the remainder of this article is as follows: In the first section, an overview of potentially relevant active situational features in the domain of anger and sadness is proposed, and individual differences in the processing of these features are derived from literature. In the next two sections, two empirical studies are presented: In the first study, individual differences in the behavioral signatures for the domain of anger and sadness are investigated; in the second, the process basis of these individual differences is examined. In Section 4, we conclude with a general discussion.

### **ACTIVE SITUATIONAL FEATURES IN THE DOMAIN OF ANGER AND SADNESS AND INDIVIDUAL DIFFERENCES IN REACTION TO THEM**

Like all negative emotions (Smith & Lazarus, 1993), anger and sadness often start with the occurrence of a negative event (Abramson,

Metalsky, & Alloy, 1989; Blaney, 2000), which may be considered a first active situational feature. Such negative events may vary in intensity (Abramson et al., 1989) as well as in quality. The latter types of variability can be linked to differences in how negative events are being appraised, as represented in cognitive theories of emotions (Frijda, Kuipers, & ter Schure, 1989; Ortony, Clore, & Collins, 1988; Roseman, 1984; Roseman, Spindel, & Jose, 1990; Scherer, 1984; Smith & Ellsworth, 1985; Smith & Lazarus, 1993). In these theories, a large number of potentially relevant appraisal dimensions have been proposed, assuming that particular kinds of appraisals are associated with particular types of emotions (including anger and sadness). In the theory of Smith and Lazarus (1993), the two major appraisals (or core relation themes) for, respectively, anger and sadness are other-blame and loss. In other research on anger (Averill, 1983; Ben-Zur & Breznitz, 1991; Levine, 1996; Smith & Lazarus, 1993; Weiner, Graham, & Chandler, 1982), other-blame is found to be a crucial feature: People appear to be especially angry when they have a negative experience that they attribute to another person who had control over what happened, that is, someone who acted intentionally and who had the potential to prevent the occurrence of the negative event. With respect to sadness, several clinical theorists of depression argue that some person types (dependent persons) are especially vulnerable to negative events that are characterized by rejection and interpersonal loss (Arieti & Bemporad, 1980; Beck, 1983; Blaney, 2000, Blatt, 1974; Robins, 1995; Robins & Block, 1988; Zuroff & Mongrain, 1987). Summarizing, one could say that both anger and sadness can be elicited by a negative event that is caused by another person.

In previous appraisal research, however, it has been argued that there is no simple one-to-one relationship between appraisals and emotions and that individual differences in this relationship may occur (Frijda & Zeelenberg, 2001; Kuppens, Van Mechelen, Smits, & De Boeck, 2003; Kuppens, Van Mechelen, Smits, De Boeck, & Ceulemans, 2005; Parkinson, 1997, 2001; Reizenzein, 2000; Russell, 2003; Scherer, 2001; Schweder, 1993; Vansteelandt & Van Mechelen, 2005). As such, the relationship between anger and sadness on the one hand and the appraisal of a negative event caused by another person on the other hand is not that clear-cut. For example, anger may also be caused by an impersonal agent (e.g., the hard disk of your computer crashes). With regard to sadness, clinical theorists of

depression suggest that person types (autonomous persons) exist who are vulnerable to achievement failure or, more generally, to negative events that are in conflict with their self-definition (Arieti & Bemporad, 1980; Beck, 1983; Blaney, 2000; Blatt, 1974; Robins, 1995; Robins & Block, 1988; Zuroff & Mongrain, 1987).

Taking all this into account, we decided to include in our study a situational feature that indicates whether a negative event is ascribed to another person, to the actor him- or herself, or to an impersonal agent. In addition, when a negative event is ascribed to a person, we included a feature indicating whether this person had control over the event or not.

Individual differences in the processing of these possibly relevant active situational features may occur for several reasons. For example, there is abundant evidence for individual differences in the number of situational cues people take into account when making behavioral decisions. Dodge (1993), for example, found that chronically aggressive boys attend to fewer active situational features in comparison to nonaggressive boys. Individual differences may also occur because some persons process active situation features in a biased way. At this point, the distinction between dependent and autonomous persons may again be relevant: Dependent persons are assumed to have chronic fears of being abandoned and to seek to gain approval and acceptance of others in order to maintain self-esteem; as such, they may be biased easily to interpret interpersonal conflicts in terms of rejection or interpersonal loss (Blatt & Zuroff, 1992). Autonomous persons, on the other hand, are assumed to be characterized by self-criticism and feelings of unworthiness and inferiority; they have high achievement strivings, and, as a consequence, they may be easily biased to attribute the causes of failure situations to their own shortcomings.

Furthermore, individual differences in anger and sadness responses may also occur because individuals display different reactions to similarly experienced situations, the so-called individual response stereotypy (Fahrenberg, 1986). For example, dependent persons may respond to experiences of rejection and interpersonal loss with anacletic reactions; also, when they fear losing another person, they may easily suppress anger responses. In contrast, autonomous persons are likely to be characterized by introjective responses; moreover, because of their intense competitiveness, they may be very critical and may attack others as well as themselves (Arieti &

Bemporad, 1980; Beck, 1983; Blatt & Zuroff, 1992). Because there may be substantial individual differences in the kind of sadness (analclitic, introjective) and anger responses (anger-in, anger-out) individuals display, multiple responses will be included in the study.

## STUDY 1

In this first study, we will examine potentially active situational features and responses in the domain of anger and sadness in a systematic and confirmatory way. For this purpose, we will propose a new extension of the TTM; in this extension, nomothetic concepts, which are manipulated by the researcher, are filled with idiosyncratic contents that are provided by the participants. The latter approach is in line with Pervin's plea (1996) to combine in the study of personality general (nomothetic) principles of functioning with idiographic contents.

The TTM extension starts by constructing formal situations on the basis of a facet-theoretical mapping sentence (Guttman, 1958, 1959; Ben-Zur & Breznitz, 1991), the facets being the active situational features under study. In Study 1, the following mapping sentence is constructed: You are in a situation in which a negative event occurs that affects you [weakly, strongly] and in which there is [no other person, one familiar other person] involved; the cause of the negative event is [the familiar other person, yourself, no person] and the person who is the cause of the negative event [has not, has] control over the negative event. The facets of this mapping sentence are mentioned between squared brackets. By taking all possible meaningful combinations of facets, sixteen formal situations were obtained.

At this point, we want to draw attention to a recurrent issue in the study of process models of personality, that is, the question "Where does the situation stop and when does the person begin?" Although active situational features and CAPS variables can be rather easily distinguished on a conceptual level, many situation characteristics very soon imply some kind of processing by the person. In this study, we take a pragmatic point of view with regard to this issue: In applying the TTM methodology, it does not matter at exactly which point one starts in the chain situation-CAPS behavior, as long as all participants start at the same point. As such, the situational features,

as mentioned above, refer to the common start of all participants. Admittedly, some situational features are more “objective” in nature (e.g., the presence of other persons in the situation), whereas others have more “subject-related” qualities (e.g., a negative event).

Given the formal situations, the participants are asked, for each formal situation, to write down a concrete situation they have experienced themselves. For example, “My grandmother died from cancer” may be a concrete situation for the formal situation “You are in a situation in which a negative event occurs that affects you strongly and in which there is one familiar other person involved; the cause of the negative event is the familiar other person and the person who is the cause of the negative event has no control over the negative event.” The advantage of this approach is twofold: On the one hand, it allows the researcher to examine nomothetic relations between active situational features and responses (and individual differences in these relations); on the other hand, it allows participants to report on concrete situations they experienced themselves rather than on hypothetical situations. Otherwise, as has been argued by Epstein (1980, 1997), the fact that participants can report on daily events they have experienced themselves may contribute to a larger ego involvement, which may, in turn, yield more robust findings.

Next, participants are required to rate each concrete situation with regard to a set of multiple responses selected by the researcher. In this study, we selected (a) an anaclitic and an anger-in response and (b) an introjective and an anger-out response since these responses are hypothesized to be typical for dependent and autonomous person types, respectively.

Finally, the person  $\times$  situation  $\times$  response data were subjected to a series of TTM analyses. As a result of such analyses, situations (persons and responses) were assigned to a limited number of situation (person, response) classes that were linked in terms of if-then rules. Relevant active situational features may be derived from the output of such analyses by inspecting the situation typology. Given the way the situations were constructed, the obvious thing to check then is to which extent the situation typology bears a simple relation to the features involved in the facet-theoretical mapping sentence. In exploratory TTM analyses, however, the interpretation of the situation typology may be blurred because of a limited number of “wrongly classified” situations. To check then whether a purer

interpretation is justified, the exploratory analyses will be supplemented by another extension of the TTM methodology that implies analyses in which the structure of the situations is user imposed. When the goodness of fit of a confirmatory TTM analysis is only slightly worse than the goodness of fit of its exploratory counterpart, one can conclude that the confirmatory interpretation of the situation structure is justified.

## Method

### *Participants*

The participants in this study were 249 first-year psychology students of the University of Leuven. Their participation was in partial fulfillment of a requirement to participate in research. The group consisted of 42 (16.9 %) men and 207 (83.1%) women (which reflects the sex proportion of first-year psychology students in Belgium). The average age of the participants was 18.6 ( $SD = .87$ , minimum = 17; maximum = 24).

### *Materials*

An experimental situation–response questionnaire was developed by fully crossing 16 situations and 6 responses. The situations were constructed on the basis of the facet-theoretical mapping sentence as discussed above. Furthermore, the following responses were included in the questionnaire: “I feel sad,” “I feel abandoned (anaclitic),” “I am dissatisfied with myself (introjective),” “I feel angry, I show my anger (anger-out), and I am bottling up my anger (anger-in).”

### *Procedure*

Participants received extended written instructions in which they were told that we were interested in personal reactions to a variety of situations. To ensure that these situations would coincide with their own experiences, we explained that the situations would first be described in terms of abstract features. These abstract situations then had to be expanded on and made specific by their describing a concrete situation for each abstract situation they had experienced in their daily life. The way this could be done was illustrated with a brief example. Next, the various abstract features of the mapping sentence were defined and illustrated.

After these instructions, the 16 facet-theoretical situations were presented in random order. For each facet-theoretical situation, participants first had to describe in writing a concrete situation they had experienced themselves. Next, they had to judge on a 3-point scale the degree to which

they displayed the six responses in each situation at the time they were in that situation (0 = *not*; 1 = *to a limited extent*; 2 = *to a strong extent*).

Visual inspection of the generated situations indicated that these situations had high ecological validity. Examples of obtained situations are: "My grandmother died from cancer," "A friend did not invite me to her birthday party," "I missed my train; as a consequence, I arrived late at home and my mother was very worried," "I failed my statistics exam," and so forth.<sup>1</sup>

### *Analysis*

The person  $\times$  situation  $\times$  response data were analyzed by means of the individual differences hierarchical classes analysis (INDCLAS) algorithm (Leenen, Van Mechelen, De Boeck & Rosenberg, 1999; Vansteelandt & Van Mechelen, 1998). This algorithm operates on a three-way, three-mode dichotomized data matrix in order to find the best fitting TTM. The algorithm generates a series of models of increasing complexity or rank, with rank referring to the maximum number of classes allowed at the base of the person, situation, and response hierarchies. The optimal rank (comparable to the number of factors extracted in factor analysis) can be determined by means of a scree test on a goodness-of-fit  $\times$  rank plot. To calculate the goodness-of-fit statistic, each person  $\times$  situation  $\times$  response data entry in the original data matrix is compared with the data entry in the data matrix that is constructed on the basis of the selected model with a concordance indicating that a zero (one) is predicted by the model, whereas the original data-matrix also contains a zero (one); then, the goodness-of-fit index equals the proportion of concordances.

The INDCLAS algorithm allows for confirmatory, in addition to exploratory, analyses. In the confirmatory case, the user has to impose the solution for one (or two) of the three modes (e.g., situations), and then the INDCLAS algorithm searches the best fitting hierarchical structure for the remaining mode(s). Goodness of fit of the results of confirmatory and exploratory analyses should be compared; if the confirmatory result is only slightly worse than its exploratory counterpart, it can be retained.

1. To test the correspondence between the situations as generated by the participants and the formal facets as mentioned in the generation instructions, a blind rater read a random sample of 100 generated situations and indicated which facets were present in them. The ratings were hampered by the lack of clarity of many situation descriptions, yet the overall correspondence appeared to be reasonable (the mean proportion of correct classifications, averaged across facets, was 73.7%) (see also General Discussion).

In our study, the person  $\times$  situation  $\times$  response data were first dichotomized (zero vs. 1 or 2) and then subjected to exploratory INDCLAS analyses in ranks 1 to 5. After selection of the optimal rank model, interpretations of the situation structure of this model in terms of active situational features were derived. These interpretations were further tested in confirmatory analyses. For the selection of the final model, results of exploratory and confirmatory analyses were compared. To check the stability of the final solution, an odd-even split of the sample of persons was performed; reliability was then examined by comparing the situation and behavior structures of exploratory INDCLAS analyses of the data of the two samples.

### Results

An exploratory TTM of Rank 3 was chosen; the global goodness of fit of this solution was 0.734, implying that 73% of the entries in the original data matrix could be correctly predicted from the chosen TTM. INDCLAS solutions in the chosen rank appeared to be stable across two subsamples of persons as obtained from an odd-even split (with Jaccard congruence coefficients taking values of 0.80 and 0.83 for the situation and response structures, respectively).

In the selected TTM, all persons, all situations, and all responses are classified into 8 nonempty, mutual exclusive person classes, 6 nonempty situation classes, and 4 nonempty response classes. As will be discussed later, each person type is characterized by a person-type-specific set of if (situation class)–then (response class) rules, as can be seen in Table 1. Further, it may be noted that, to avoid an overloaded presentation, we opted for not displaying the prototypicality of the persons, situations, and responses and for not displaying the probabilities of the if–then rules (see discussion of the TTM earlier). The reader should bear in mind that although class membership and the if-then rules are stated in an absolute manner, membership, in fact, is a matter of degree, and if–then rules are associated with a conditional probability that a person of the person type under consideration will display a behavior of the behavior class in a situation of the situation class.

The hierarchy of the situation classes of this TTM is shown in Figure 1. Note that for clarity's sake, we attached to each of the lower-hierarchy classes (i.e., Situation Classes 2, 3, and 4) the feature that applied to that class as well as all hierarchically higher classes. To facilitate the interpretation, we recall that two situations belong

**Table 1**  
**Person Types Characterized by If (Situational Feature)-Then (Response Class) Rules (Study 1)**

PERSON TYPE*	IF (SITUATIONAL FEATURE)	THEN (RESPONSE CLASS)			
		R1. Negative feelings	R2. anger-out	R3. introjective	R4. anacletic
P0. (.16) not-differentiating	IF negative event THEN	1	1	1	1
P1. (.11) other-focused	IF cause = other THEN	1	1	1	1
P2. (.10) self-focused	IF cause = not other THEN	1	1	1	0
P3. (.07) intensity-focused	IF cause = self THEN	1	1	1	1
P4. (.21) other- and self-focused	IF cause = not self THEN	1	1	0	1
	IF intensity = strong THEN	1	1	1	1
	IF intensity = weak THEN	1	0	1	0
	IF cause = other THEN	1	1	0	1
	IF cause = self THEN	1	1	1	0
	IF cause = no person THEN	1	1	0	0
P6. (.13) self- and intensity-focused	IF intensity = strong & cause = self THEN	1	1	1	1
	IF intensity = strong & cause = not self THEN	1	1	0	1
	IF intensity = weak & cause = self THEN	1	0	1	0
	IF intensity = weak & cause = not self THEN	1	0	0	0

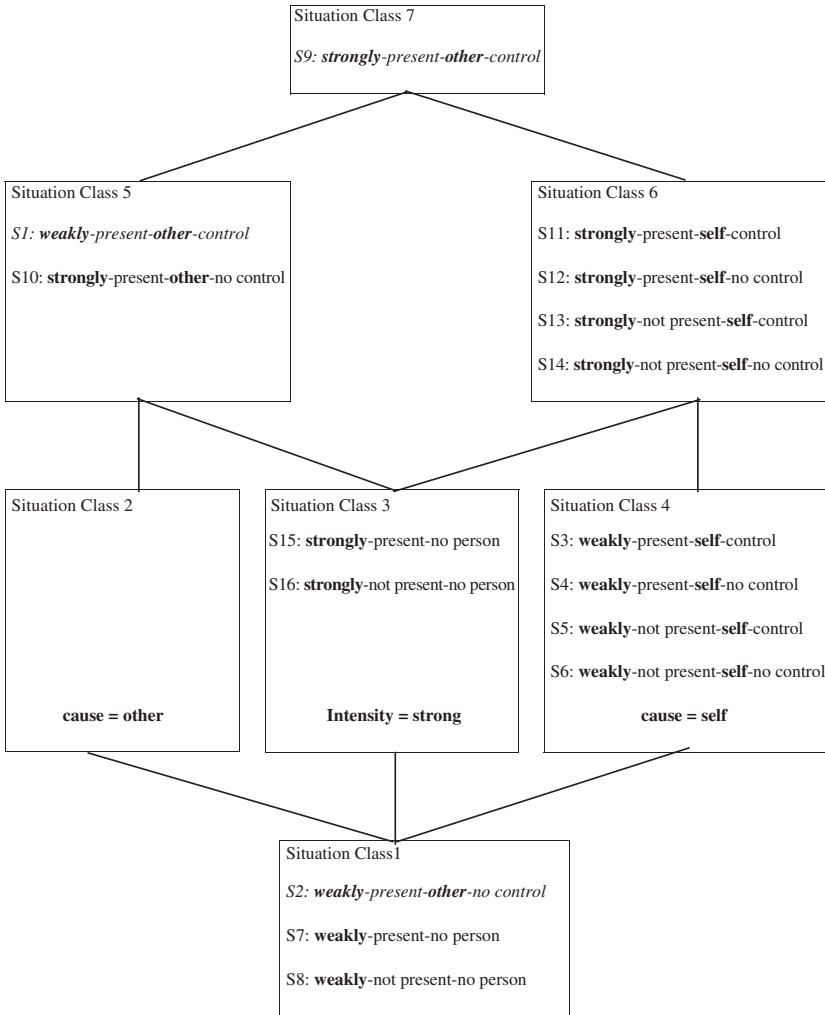
*(continued)*

**Table 1 (Cont.)**

PERSON TYPE*	IF (SITUATIONAL FEATURE)	THEN (RESPONSE CLASS)			
		R1. Negative feelings	R2. anger-out	R3. introjective	R4. anaclitic
P7. (.19)	IF intensity = strong & cause = other THEN	1	1	0	1
self-, other-, and	IF intensity = strong & cause = self THEN	1	1	1	0
intensity-focused	IF intensity = strong & cause = no person THEN	1	1	0	0
	IF intensity = weak & cause = other THEN	1	0	0	0
	IF intensity = weak & cause = self THEN	1	0	1	0
	IF intensity = weak & cause = no person THEN	1	0	0	0

*Note:* A one (zero) indicates that the responses of a response class are (not) displayed in the situations of the situation class in question.

\*Values between parentheses indicate the proportion of persons belonging to each person type.



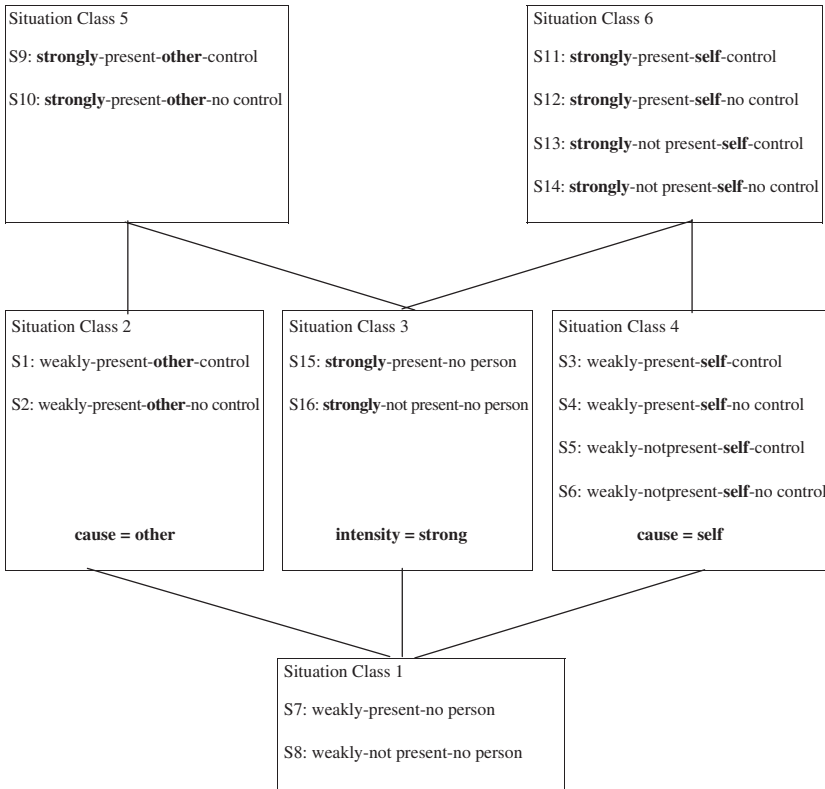
**Figure 1**

Hierarchical organization of situation classes in the exploratory TTM. S1, S2, ..., S16 refer to the 16 formal situations; the involved active situational features are indicated after the double point. "Weakly-strongly" refers to the intensity of the negative event; "not present-present" to whether a familiar other person was present in the situation or not; "other-self-no person" to whether the negative event was caused by the other person, by the participant him/herself, or by no person; "no control-control" to whether the cause of the negative event had control or not over the occurrence of the negative event.

to the same situation class when each respondent displays the same responses in both situations; also, when a person displays a particular response in a situation of a situation class, he or she will also display the same response in the situations of all hierarchically higher situation classes (see Vansteelandt & Van Mechelen, 1998). For example, if a person shows his or her anger in situations of Situation Class 4, then this person will also show his or her anger in situations of Situation Class 6 (which is higher in the hierarchy and connected to Situation Class 4 with a line), while the reverse is not true. In general, hierarchically higher situation classes are broader than lower-situation classes, with the breadth of a situation class being defined in terms of the number of person-response combinations associated with them.

Inspection of Figure 1 indicates that the structure of the situations is largely based on two facets of the mapping sentence (indicated in bold in the figure): (a) the cause of the negative event (another person, the subject him- or herself, no person) and (b) the intensity of the negative event (affects the subject weakly or strongly). For example, all situations of Situation Class 6 are situations with a negative event that affected the participant strongly and that were caused by the subject him- or herself. It can further be seen that the relation between the situation structure and the active-situational-features cause and intensity is not perfect: Three situations (indicated in italics in Figure 1: S1, S2, and S9) do not belong to the correct situation class in order for the proposed feature interpretation to be perfect. For example, Situation 1 (weakly-present-other-control) and Situation 2 (weakly-present-other-no control) belong to Situation Classes 5 and 1, respectively, while, according to our interpretation, both should be in Situation Class 2 (as both have the features weakly and other). To examine whether our feature interpretation is justified, a confirmatory INDCLAS analysis was performed with the structure of the situations implied by the interpretation being imposed a priori; this situation structure is shown in Figure 2. The goodness of fit of the confirmatory model (0.730) hardly appeared to differ from the goodness of fit of the exploratory model (0.734). As a consequence, the confirmatory model can be retained.

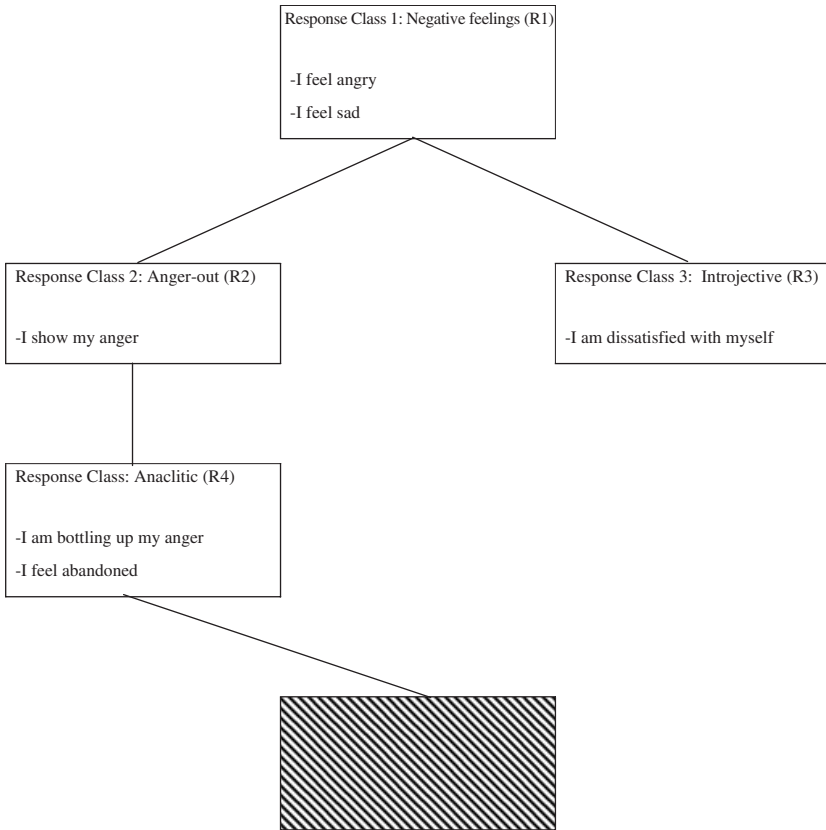
The hierarchy of the response classes is presented in Figure 3. Note that two responses belong to the same response class if, for each person in each situation, he or she either displays none or both responses;



**Figure 2**

Hierarchical organization of situation classes in the confirmatory TTM. “Weakly-strongly” refers to the intensity of the negative event; “not present-present” to whether a familiar other person was present in the situation; “other-self-no person” to whether the negative event was caused by the other person, by the participant him/herself or by no person; “no control-control” to whether the cause of the negative event had control over the occurrence of the negative event.

furthermore, when the responses of a hierarchically lower response class are displayed by a person in a situation, the responses of all hierarchically higher response classes will also be displayed by that person in that situation (see Vansteelandt & Van Mechelen, 1998). For example, persons who feel dissatisfied with themselves (Response Class 3) in a particular situation will also feel sad and angry in this situation (sad and angry belonging to the hierarchically higher Response Class 1), while the reverse is not true. In this hierarchy, too, hierarchically higher response classes are broader than hierarchically



**Figure 3**

Hierarchical organization of response classes in the confirmatory TTM.

lower response classes with breadth of a response class being defined in terms of the number of person-situation combinations associated with it. For example, Response Class 1 (“I feel angry,” “I feel sad”) is broader than Response Class 2 (“I show my anger”) as the former is associated with more person-situation combinations. Note that the shaded class is a so-called empty response class; this is a response class that does not contain any response and is displayed in the figure for reasons that will be explained later on.

Table 1 presents the person classes to which at least 5% of the sample of persons belong. As further shown in this table, each person class is characterized by a set of if (situational feature)–then (response class) rules, with a 1 (0) indicating that the persons of the

person class display (resp. do not display) the responses of the response class in the situations of the situation class. These sets of rules can be considered the behavioral signatures of the person types under study. From a careful inspection of Table 1, it is clear that persons of Person Type P0 display all responses whatever negative event occurs; stated otherwise, in terms of responses, these persons do not differentiate between negative events. As a consequence, this person type is labeled as the not-differentiating person type. Those of other person types display, on the one hand, a number of responses in reaction to all negative events and, on the other hand, a number of responses in reaction to a subset of negative events only. We label these other person types in terms of the situational features that guide their behavior. The labels of all person types are shown in the leftmost column of Table 1. For example, persons of Person Type P3 show their anger (R2) and display anaclitic responses (R4) when a negative event occurs that affects them strongly; the responses of the other response classes are displayed in reaction to all negative events. This person type is therefore called the intensity-focused person type.

### Discussion

With regard to the structure of the *situations*, the results of this study indicate that negative situations are functionally equivalent for all persons when they are similar in terms of two active situational features, that is, the agent or cause and the intensity of the negative event. The distinction between negative events that are caused by another person versus by the actor him- or herself reconfirms the fruitfulness of the distinction between interpersonal negative events and self-definition-related negative events (Arieti & Bemporad, 1980; Beck, 1983; Blaney, 2000; Blatt, 1974; Zuroff & Mongrain, 1987). The importance of differences in intensity between negative events (Abramson et al., 1989) was also confirmed in this study.

With regard to the structure of the *responses*, it is somewhat surprising that feelings of anger and sadness are displayed by all persons in reaction to all negative events. Otherwise, the co-occurrence of both feelings is in line with previous research that suggests that sadness and anger are interwoven and often co-occur; persons may, for example, become sad because they blame themselves for expressing their anger (Beck, 1976; Beck, Rush, Shaw, & Emery, 1979; Frijda, 1986; Levine, 1996). Furthermore, in line with earlier findings (Blatt

& Zuroff, 1992), the anaclitic response (“I feel abandoned”) and bottling-up of anger belong to the same response class, which means that when persons feel abandoned, they are always bottling up their anger and vice versa. Yet, feelings of dissatisfaction with oneself (an introjective response) and showing anger do not belong to the same response class: Expression of anger mainly relates to the intensity of the negative event, while dissatisfaction with oneself relates to whether or not the negative event is caused by the actor him- or herself. Note that, in contrast to predictions from cognitive appraisal theories on emotion (Smith & Lazarus, 1993), both aggressive and depressive responses may be displayed in reaction to the same situation. This finding may stimulate further research, taking multiple responses into account, in the personality domain.

With regard to the person structure, the results of our study indicate that individual differences pertain to the number of active situational features people take into account (Dodge, 1993), which may be no or only a single feature (Person Types P0, P1, P2, P3) or multiple situational features (Person Types 4, 6, and 7). This finding can be linked to the concept of discriminative facility (Cheng, 2003; Chiu, Hong, Mischel, & Shoda, 1995). Apparently some person types either perceive less accurately the differences between the involved situations or lack the ability or flexibility to adjust their behavior to situation characteristics. Our study indicates, indeed, that persons who display many anger-out, introjective, and anaclitic responses take few or no situational features into account.

## STUDY 2

The results of Study 1 indicate that persons differ from one another in the number and kind of situational features they take into account. For example, a number of person types mainly focus on whether the negative event is caused by themselves or by somebody else and adapt their reactions accordingly; from this, one may hypothesize that such persons mainly focus on discrepancies between how they actual behaved in the situation and how they should have behaved (self-focused) or between how the significant other behaved in the situation and how he (she) should have behaved (other-focused). Such an hypothesis is in line with Higgins’s self-discrepancy theory (1987).

Self-discrepancy theory starts from the observation that people have a set of self-state representations, that is, a variety of opinions and beliefs about how they are, how they would ideally like to be, how others think they ought to be, and so forth. Self-discrepancy theory (Higgins, 1987) further states that different kinds of discrepancies between self-state representations are related to different kinds of emotional vulnerabilities and, thus, emotional responses. Extending the foregoing, other-state representations could also be considered. The latter are opinions and beliefs that persons have with respect to how a significant other person actually is (actual-other representation), would ideally be (ideal-other representation), and should be (ought-other representation). Similar to the reasoning in self-discrepancy theory, we hypothesize that different kinds of discrepancies between other-state representations are related to different kinds of emotional vulnerabilities.

The results of Study 1 further indicate that persons of certain person types mainly focus on the intensity of negative events and, as a function of this, display or do not display certain responses, whereas other person types do not take intensity into account. This result could be linked to earlier research on depression that indicates that in comparison to nondepressed persons, depressed persons tend to attribute more severe consequences to negative events, irrespective of whether those events affect them weakly or strongly. The latter would imply, indeed, that depressed persons do not differentiate well between negative events in terms of their intensity. In general, depressed persons may have the tendency to attribute negative events to stable (enduring) and global (likely to affect many outcomes) causes, and their self-esteem may also be more affected by the occurrence of a negative event (Abramson et al., 1989).

In Study 2, we wanted to examine the hypothesized psychological mechanisms as outlined above by assessing them on-line, meaning in concrete situations. For this purpose, we propose a novel extension of the TTM methodology that allows us to relate psychological processes in a direct way to an existing TTM. By doing so, it will become possible to examine in detail both universal relations and individual differences in the relations between active situational features and CAPS variables and between CAPS variables and responses, which are of utmost importance in Mischel and Shoda's (1995) theory.

The proposed extension of the TTM-methodology presupposes that a TTM has already been induced from person  $\times$  situation by

response data. The linking of the CAPS variables to the TTM then amounts to the fact that the CAPS variables are assigned to the existing (empty or filled) response classes of that TTM while the structure of this TTM is kept invariant. Most important, from the linkage between the CAPS variables and the TTM, it will be possible to derive a characterization of the person types in terms of sets of if (situational feature)–then (CAPS variable class) and if (CAPS variable class)–then (response class) rules.

This novel extension of the TTM provides the researcher with a tool to investigate two important questions with regard to the CAPS for the behavioral domain under study. The first question is whether all behavioral signatures can be explained in terms of the if (situational feature)–then (CAPS variable class) and if (CAPS variable class)–then (response class) rules of the different person types. The second question pertains to where in the CAPS the most important sources of individual differences in behavioral signatures can be located. Is this in the situational feature–CAPS variable or in the CAPS variable–response class links? Also, can it be determined if there are universal situational-feature–CAPS variable and CAPS variable–response rules, that is, rules that hold for all persons? As such, the TTM methodology allows one to discover universal and differential processes in the CAPS.

## Method

### *Participants*

The participants in this study are 258 first-year psychology students of the University of Leuven (different from those in Study 1). Their participation was in partial fulfillment of a requirement to participate in research. The group consisted of 37 (14.3%) men and 221 (85.7%) women (which reflects the sex proportion of first-year psychology students in Belgium). The average age of the participants was 18.2 ( $SD = .65$ , minimum = 17; maximum = 22).

### *Materials*

*Facet-theoretical situation–response questionnaire.* Participants in Study 1 indicated that expanding the formal situations with concrete situations placed a relatively great burden on them. For this reason, in Study 2, we decided to remove the facet [control, no control] from the mapping sentence; although the attribution literature clearly indicates that control by

others is important in feelings of anger, one may note that this facet did not play a significant role in the results of Study 1. Perceived control over the occurrence of the negative event was assessed, instead, as a CAPS variable. The facet-theoretical mapping sentence of Study 2 is therefore the following: "You are in a situation in which a negative event occurs that affects you [weakly, strongly] and in which there is [no other person, one familiar other person] involved; the cause of the negative event is [the familiar other person, yourself, no person]." By taking all meaningful combinations of active situational features, 10 formal situations were obtained. An example of a formal situation is "You are in a situation in which a negative event occurs that affects you strongly and in which there is one familiar person involved; the cause of the negative event is the other person" (example of a specific situation: "A close friend of mine did not invite me to her party").

The same six responses as in Study 1 were used in Study 2. All 10 situations were fully crossed with all 6 responses resulting in a questionnaire with 60 situation–response combinations.

*Experimental contextualized CAPS questionnaire.* In each situation 11 CAPS variables were investigated. The first four referred to attribution-related aspects, the fifth to perceived control, and the last six to various types of discrepancies between the actual, ought, and ideal self-domains as viewed from two standpoints (self respectively other): (1) Stable attribution (item: "To what extent did you think that the cause of the negative event could be changed?"); (2) Global attribution (item: "To what extent did you think that the negative event would have consequences for many aspects of your life?"); (3) Severity of consequences of the negative event (item: "To what extent did you think that the consequences of the negative event would be severe?"); (4) Impact on self-esteem (item: "To what extent did the negative event decrease your self-esteem?"), (5) Perceived control (item: "To what extent did you have the feeling that you had control over what happened?") (6) Discrepancy between actual-self and ideal-self representation/self (item: "To what extent did you think that how you were deviated from how you ideally would like to be?"); (7) Discrepancy between actual- and ought-self representation/self (item: "To what extent did you think that how you were deviated from how you ought to be?"); (8) Discrepancy between actual- and ideal-self representation/other (item: "To what extent would a significant other person find that how you were in that situation deviated from how you ideally should be?"); (9) Discrepancy between actual- and ought-self representation/other (item: "To what extent would a significant other person find that how you were in that situation deviated from how you ought to be?"); (10) Discrepancy between actual and ideal-other representation

(item: “To what extent did the other person deviate from how (s)he ideally should be?”); and (11) Discrepancy between actual and ought-other representation (item: “To what extent did the other person deviate from how (s)he ought to be?”).

### *Procedure*

The instructions of the Situation–Response Questionnaire were the same as in Study 1. After having rated the six responses in each situation, participants were asked to rate the 11 CAPS variables (which were presented in the same order as mentioned above). Participants had to indicate to what extent a CAPS variable applied to them in each situation at the moment they were in that situation using a 3-point scale (0 = *not*; 1 = *to a limited extent*; 2 = *to a strong extent*).

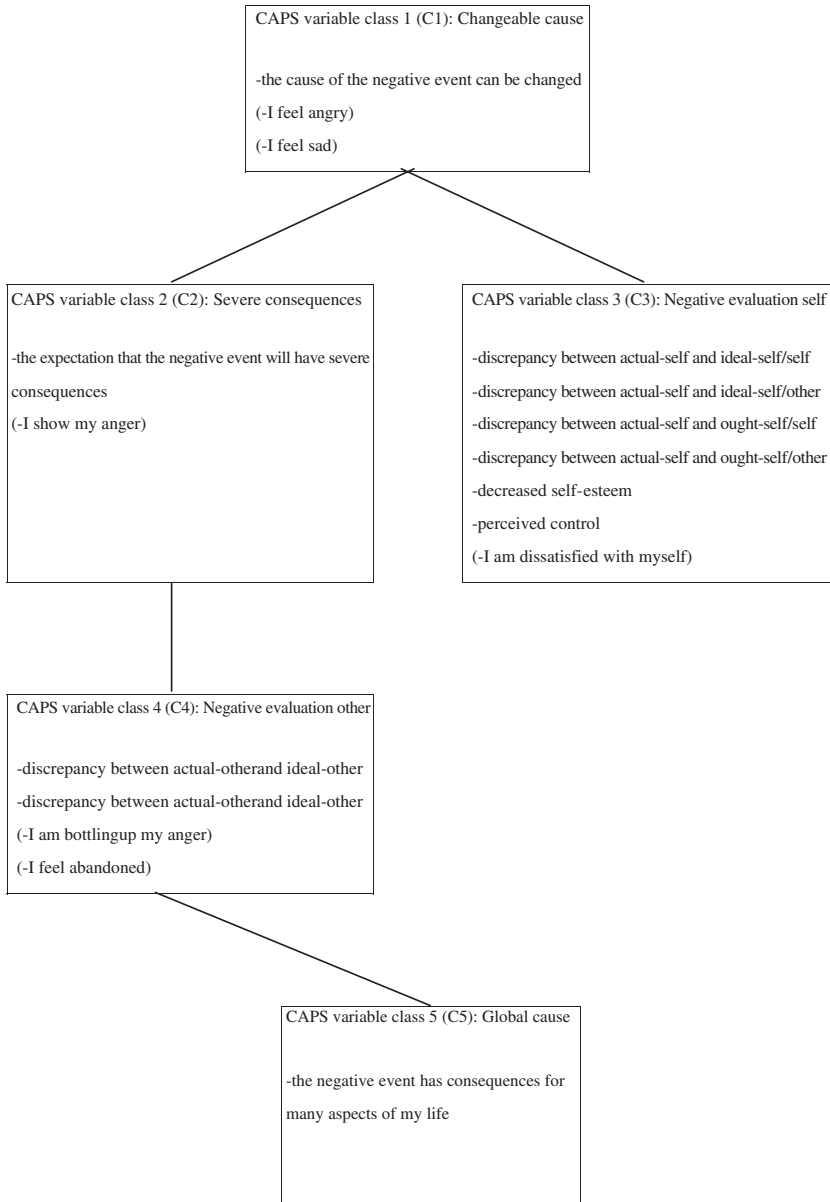
### *Analysis*

In a first step, the person  $\times$  situation  $\times$  response data were dichotomized (zero vs. one or two) and analyzed using the INDCLAS-algorithm in ranks 1 to 5. To evaluate the stability of the results of Study 1, a confirmatory analysis was also performed with the structure of the situations and responses being fixed a priori according to the final result of Study 1 (ignoring the control feature for the situations). The global goodness-of-fit value of the confirmatory TTM was 0.767. To assure that we did not force our data wrongly into our a priori model, we compared this solution with an exploratory model; given the fact that the goodness of fit of this exploratory model (0.772) was only slightly better than the confirmatory TTM, we felt safe that we found a stable and robust solution. A remarkable difference between both studies, however, is that there are some substantial differences in the proportion of participants belonging to the distinctive person types. More in particular, the proportion of persons belonging to the not-differentiating (P0) and intensity-focused (P3) person types is larger in Study 2 in comparison with Study 1, whereas the proportion of persons belonging to the other- and self-focused person type (P6) and the self-, other-, and intensity-focused person type (P7) is smaller in Study 2; the latter indicates that, in general, participants of Study 2 displayed more anger and sadness responses. One may wonder whether this difference is a true one or rather some methodological artifact implied by the method of analysis. A comparison of the proportions of anger and sadness responses in the raw data (amounting to 0.611 and 0.687 in Study 1 and Study 2, respectively) suggests that the found difference is a true one, however.

In a second step, the on-line measured CAPS variables were linked to the TTM of Step 1. To do this, a confirmatory INDCLAS-analysis was performed on the dichotomized (zero vs. one or two) person  $\times$  situation  $\times$  (response+CAPS variable) data with the structure of the persons and situations being fixed on the structure obtained in Step 1 (which implies that the structure of the responses is also the same as in Step 1). In this way, the TTM of Step 1 is kept invariant while the CAPS variables are linked directly to this TTM by assigning them to the existing (empty or filled) response classes.

## RESULTS AND DISCUSSION

As the structure of the situations and responses of the TTM in this study is the same as in Study 1, we will focus on the relations, on the one hand, between active situational features and CAPS variables and, on the other hand, between CAPS variables and responses. Again, one may note that we do not mention the prototypicality of the persons, situations, responses, and CAPS variables and the probabilities for the if-then rules. Yet, once again, the reader should bear in mind that although class membership and if-then rules are stated in an absolute manner, membership, in fact, is a matter of degree and if-then rules are associated with conditional probabilities. The clustering of the CAPS variables is presented in Figure 4. Two CAPS variables belong to the same CAPS variable class when it holds for each person that either both or none of the two CAPS variables are elicited by a particular situation. It may be observed that the different responses have also been entered in the CAPS variable classes of Figure 4 (between parentheses) and that the CAPS variable classes themselves are also hierarchically organized. The latter implies that when a CAPS variable from a hierarchically lower CAPS variable class is elicited from a particular person by a particular situation, then the CAPS variables in the hierarchically higher classes (connected to the former by a line) will also be elicited from that person by that situation, while the reverse is not true. For example, when a particular situation activates a negative evaluation of another person (C4, a hierarchically lower class) in a particular person, this situation will also activate the expectation that the situation will have severe consequences (C2, a hierarchically higher class connected to it by a line) in that person, the reverse not being true. It may be noted that, on the basis of the same hierarchical organization, also the if (CAPS variable class)-then (response class) rules can be derived. For example, a CAPS variable from a particular CAPS variable class will activate all the responses that belong to the same class or to hierarchically higher classes



**Figure 4**  
Hierarchical organization of CAPS variable classes in the confirmatory TTM.

that are connected to it by a line. Breadth of CAPS variable classes is defined in terms of person-situation combinations in an analogous way as breadth of response classes.

#### *Relations Between Active Situational Features and CAPS Variables*

In Table 2, the universal if (situational feature)–then (CAPS variable class) rules are displayed that apply to all persons, irrespective of the person type to which they belong. All the negative events are presumed by the participants to have a cause that can be changed in the future (C1); this finding may be related to the fact that we sampled our participants from a normal population not characterized by feelings of helplessness—a characteristic typical of a population of depressed people (Abramson et al., 1989). Furthermore, intensive negative events apparently elicit expectations of severe consequences (C2) from all person types. Negative self-evaluation (C3) is activated when someone blamed him- or herself for a negative event, whereas negative evaluation of others (C4) is activated when someone else is blamed and when the negative event affects the actor strongly.

In addition, some if (situational feature)–then (CAPS variable class) rules only apply to particular person types. In Table 3 all such rules are presented for the major person types. In general, it can be seen in this table that the activation pattern of CAPS variables for the different person types is a direct function of the number and kind of situational features each person type takes into account. For example, persons of the self- and intensity-focused person type (P6) only expect consequences for many aspects of their life (C5) if they consider themselves the cause of the negative event *and* if the negative event affects them strongly. Persons of the not-differentiating person type (P0), who display all responses in reaction to all negative events, are characterized by the fact that, for them, all CAPS variables are activated, irrespective of the kind of negative event that occurs.

#### *Relations Between CAPS Variables and Responses*

Table 4 presents the universal if (CAPS variable class)–then (response class) rules that hold for *all* person types. In this table, it can be seen that if the cause of a negative event is presumed to be changeable (C1), only some general negative feelings (R1) are activated. From this table, it further appears that, in line with self-discrepancy theory (Higgins, 1987), discrepancies between actual-self and ideal-self representations (C3) result in dejection-related emotions such as feelings of sadness and dissatisfaction with oneself (R1 and R3). In contrast with predictions from self-

**Table 2**  
**If (Situational Feature)–Then (CAPS Variable Class) Rules That Hold for All Persons (Study 2)**

IF (SITUATIONAL FEATURE)	THEN (CAPS variable CLASS)				
	C1. changeable cause	C2. severe conseq.	C3. negative evaluation self	C4. negative evaluation other	C5. global cause
IF intensity = strong & cause = other THEN	1	1	0	1	0
IF intensity = strong & cause = self THEN	1	1	1	0	0
IF intensity = strong & cause = no person THEN	1	1	0	0	0
IF intensity = weak & cause = other THEN	1	0	0	0	0
IF intensity = weak & cause = self THEN	1	0	1	0	0
IF intensity = weak & cause = no person THEN	1	0	0	0	0

*Note:* A one (zero) indicates that the cognitive-affective personality system (CAPS) variables of the CAPS variable class in question are activated when the active situational features are present.

**Table 3**  
**Person Types Characterized by If (Situational Feature)-Then (CAPS Variable Class) Rules (Study 2)**

PERSON TYPE*	IF (SITUATIONAL FEATURE)	THEN (CAPS variable CLASS)				
		C1. changeable cause	C2. severe conseq.	C3. negative evaluation self	C4. negative evaluation other	C5. global cause
P0. (.29) not-differentiating	IF negative event THEN	1	1	1	1	1
P1. (.10) other-focused	IF cause = other THEN	1	1	1	1	1
P2. (.11) self-focused	IF cause = not other THEN	1	1	1	0	0
P3. (.15) intensity-focused	IF cause = self THEN	1	1	1	1	1
P4. (.12) other- and self-focused	IF cause = not self THEN	1	1	0	1	0
P6. (.12) self- and intensity-focused	IF intensity = strong THEN	1	1	1	1	1
	IF intensity = weak THEN	1	0	1	0	0
	IF cause = other THEN	1	1	0	1	0
	IF cause = self THEN	1	1	1	0	0
	IF cause = no person THEN	1	1	1	0	0
	IF intensity = strong & cause = self THEN	1	1	1	1	1
	IF intensity = strong & cause = not self THEN	1	1	0	1	0
	IF intensity = weak & cause = self THEN	1	0	1	0	0
	IF intensity = weak & cause = not self THEN	1	0	0	0	0

*(continued)*

**Table 3 (Cont.)**

PERSON TYPE*	IF (SITUATIONAL FEATURE)	THEN (CAPS variable CLASS)				
		C1. changeable cause	C2. severe conseq.	C3. negative evaluation self	C4. negative evaluation other	C5. global cause
P7. (.05)	IF intensity = strong & cause = other THEN	1	1	0	1	0
self-, other-	IF intensity = strong & cause = self THEN	1	1	1	0	0
and intensity-	IF intensity = strong & cause = no person THEN	1	1	0	0	0
focused	IF intensity = weak & cause = other THEN	1	0	0	0	0
	IF intensity = weak & cause = self THEN	1	0	1	0	0
	IF intensity = weak & cause = no person THEN	1	0	0	0	0

*Note:* A one (zero) indicates that the variables of a cognitive-affective personality system (CAPS) variable class are (not) displayed in the situations of the situation class in question.

\*Values between parentheses indicate the proportion of persons belonging to each person type.

**Table 4**  
**If (CAPS Variable Class)-Then (Response Class) Rules That Hold for All Persons**

IF (CAPS variable CLASS)	THEN (RESPONSE CLASS)			
	R.1. negative feelings	R.2. anger-out	R.3. introjective	R.4. anacletic
IF C1. changeable cause THEN	1	0	0	0
IF C2. severe consequences THEN	1	1	0	0
IF C3. negative evaluation self THEN	1	0	1	0
IF C4. negative evaluation other THEN	1	1	0	1
IF C5. global cause THEN	1	1	1	1

*Note:* A one (zero) indicates that the responses of a response class are (not) displayed when the cognitive-affective personality system (CAPS) variables of the CAPS variable class in question are activated.

discrepancy theory, however, discrepancies between actual-self and ought-self representations (also C3) are associated with the same emotional reactions. Furthermore, the fact that negative self-evaluation—not reaching one's goals—results in an introjective response (R3) and that negative evaluation of others (C4) results in anaclitic reactions is in line with theories on autonomy and dependency in depression (Beck, 1983; Blatt & Zuroff, 1992). Finally, it is clear that when a negative event is expected to have consequences for many aspects of your life (C5), many responses are displayed (R1, R2, R3, and R4).

In addition, a number of if (CAPS variable class)—then (response class) rules hold for distinct person types only. In Table 5, all such rules are displayed for the major person types. It can be seen in this table, for example, that, if persons of the other-focused person type (P1) make a negative evaluation of the other person in a situation, they will display anger-out (R2), introjective (R3), and anaclitic (R4) reactions; for persons of the self-focused person type (P2), this is the case when they make a negative self-evaluation. In general, it appears that some person types (P0) are only characterized by a single (P0) or two (P1, P2, P3) if (CAPS variable class)—then (response class) rules, whereas other person types (P5, P6, P7) are characterized by several such rules.

#### *Cognitive–Affective Domain Map and Behavioral Signatures*

At this point, all information is available to answer the question whether the behavioral signatures of the distinctive person types can be explained on the basis of the if (situational feature)—then (CAPS variable class) and the if (CAPS variable class)—then (response class) rules. Making use of Figure 5, we will illustrate this for the other- and self-focused person type (P4). The leftmost part of Figure 5 displays the behavioral signature of this person type, whereas the rightmost part of the same figure displays the if (situational feature)—then (CAPS variable class) rules and if (CAPS variable class)—then (response class) rules. The latter part of the figure should be read as follows: One starts with the situations, follows the arrows, and ends up with the responses. The if (situational feature)—then (CAPS variable class) rules are to be read from left to right, whereas the if (CAPS variable class)—then (response class) rules are to be read from top to bottom. In this figure, universal if–then rules, which hold for all person types, are displayed in black, whereas the rules that are specific for the person type under study are displayed in gray. Note that all universal rules can easily be derived from Tables 2 and 4, whereas the person-type-specific rules can be derived from Tables 3 and 5. General feelings of anger and sadness have been omitted from this figure because both feelings are displayed in all situations and because both feelings are implied

**Table 5**  
**Person Types Characterized by If (CAPS Variable Class)-Then (Response Class) Rules**

PERSON TYPE	IF (CAPS variable CLASS)	THEN (RESPONSE CLASS)			
		R2. anger-out	R3. introjective	R4. anaclitic	
P0. not-differentiating	IF changeable cause (C1) & severe conseq. (C2) & negat. eval. self (C3) & negat. eval. other (C4) THEN	1	1	1	
P1. other-focused	IF negat. eval. other (C4) THEN	1	1	1	
P2. self-focused	IF changeable cause (C1) & negat. eval. self (C3) & sever. conseq. (C2) THEN	1	1	0	
P3. intensity-focused	IF neg. eval. self (C3) THEN	1	1	1	
P4. other- and self-focused	IF changeable cause (C1) & sever. conseq. (C2) & neg. eval. other (C4) THEN	1	0	1	
P5. intensity-focused	IF severe. conseq. (C2) & neg. eval. other (C4) THEN	1	1	1	
P6. other- and self-focused	IF changeable cause (C1) & neg. eval. self (C3) THEN	0	1	0	
P7. self-, other- and intensity-focused	IF neg. eval. other (C4) THEN	1	0	1	
P8. self-, other- and intensity-focused	IF neg. eval. self (C3) THEN	1	1	0	
P9. self-, other- and intensity-focused	IF changeable cause (C1) & severe conseq. (C2) THEN	1	0	0	
P10. self-, other- and intensity-focused	IF neg. eval. self (C3) THEN	0	1	0	
P11. self-, other- and intensity-focused	IF severe conseq. (C2) & neg. eval. other (C4) THEN	1	0	1	
P12. self-, other- and intensity-focused	IF changeable cause (C1) THEN	0	0	0	
P13. self-, other- and intensity-focused	IF negative evaluation other (C4) THEN	1	0	1	
P14. self-, other- and intensity-focused	IF negative evaluation self (C3) THEN	0	1	0	
P15. self-, other- and intensity-focused	IF severe consequences (C2) THEN	1	0	0	
P16. self-, other- and intensity-focused	IF changeable cause (C1) THEN	0	0	0	

*Note:* A one (zero) indicates that the responses of a response class are (not) displayed when the variables of the involved cognitive-affective personality system (CAPS) variable class are activated.



by all CAPS variables. As can easily be seen, the behavioral signature of the person type under study can be explained on the basis of the if (situational feature)–then (CAPS variable class) and the if (CAPS variable class)–then (response class) rules; that is, the leftmost part of Figure 5 can be constructed on the basis of the information in the rightmost part of the same figure.

In general, we can reconstruct the behavioral signatures of all person types in this way. This implies that our set of CAPS variables is sufficient to explain the behavioral signatures of all person types. Moreover, we also found that the behavioral signatures of all person types can be correctly predicted on the basis of all universal rules plus the person-type-specific if (situational feature)–then (CAPS variable class) rules; the latter means that the person-type-specific if (CAPS variable class)–then (response class) rules are not needed to reconstruct the behavioral signatures of all person types. Therefore, all major individual differences in behavioral signatures can be explained in terms of individual differences in the links between situational features and CAPS variables.

## GENERAL DISCUSSION

In this article, we introduced two new extensions of the TTM methodology (Vansteelandt & Van Mechelen, 1998) to study individual differences in behavioral signatures and their underlying process basis. The extended methodology was applied in two contextualized studies of sadness and anger. Although there were some discrepancies between the two studies in terms of the distribution of participants across the distinct person types, the structure of individual differences in behavioral signatures proved to be fairly stable across two samples of subjects. Further, individual differences in behavioral signatures appeared to be clearly related to the number and kind of active situational features that persons take into account, the latter result linking up with previous research on information-processing biases (Dodge, 1993).

The extended TTM methodology allows the researcher to manipulate active situational features in a systematic way, similar to manipulations in laboratory experiments, while, at the same time, participants can report on events that they experienced themselves. This may increase ego involvement (Epstein, 1980, 1997) as well as ecological validity. The use of idiographic materials contained in the proposed methodology allows us to take, at least in part, dynamic person  $\times$  situation interactions into account. Moreover, by means of the extended methodology, it is possible to examine the CAPS more

in detail; in particular, one may uncover how individual differences in behavioral signatures can be understood in terms of both universal links and individual differences in links between situational features and CAPS variables and between CAPS variables and responses classes. From this analysis, the major conclusions for the domains of anger and sadness can be briefly summarized as follows: First, in contradiction with some cognitive theories of emotion, there seems to be no clear one-to-one relation between situational antecedents/appraisals and anger/sadness, and substantial individual differences in these links exist. Second, also contradicting some cognitive appraisal theories of emotions, two different emotions—anger and sadness—may be experienced by persons in the same situation. In addition, there exist substantial individual differences in the response patterns that persons display in reaction to the same situation. Third, there exist universal as well as person-type-specific links between situational features and CAPS variables and between CAPS variables and responses. Fourth, to understand individual differences in behavioral signatures for the domains of anger and sadness, individual differences in the links between situational features and CAPS variables proved to be most crucial.

Two remarks can be made with respect to the present study. The first concerns participants' generating concrete instances for the formal situations. This strategy may have led to some forms of bias. One form of bias may be due to the fact that participants might have generated situations that did not exactly match the features of the formal situations. This kind of bias might explain why the control facet did not play a role in Study 1, unlike in several previous studies on anger (see, however, Berkowitz & Harmon-Jones, 2004). A problem in evaluating this kind of bias is that the written situation descriptions of the participants were not always too clear. Moreover, the judgment of some features requires some type of subjective appraisal process that is impossible for an external rater to judge. For example, some participants appraised "failing an exam" as a negative event caused by themselves, whereas other participants appraised the same situation as a negative event caused by another person. In any case, the fact that we found a robust structure for the situations in two independent samples of persons indicates that the generation of concrete situations by the participants was not invalid. A second form of bias may be introduced by the characteristics of autobiographical memory (Shiffman & Stone, 1998). For example,

retrospective reports on an event may be different from reactions at the time of the event itself because knowledge about the outcome of the event may bias the retrospective report (Brewer, 1994). As a consequence, participants might have displayed other responses in the actual situation in comparison with the self-report. In addition, there may also be a bias in the kind of situations participants generated as people often base their retrospective reports on stereotypes or schematic information (Shiffman & Stone, 1998).

Secondly, the TTM we proposed is a typological approach to the study of personality; as such, it touches upon the discussion of typologies versus dimensions in the personality domain (De Boeck, Wilson, & Acton, 2005; Gangestad & Snyder, 1985; Haslam & Kim, 2002; Meehl, 1992). Within this context, one may wonder whether the proposed TTM allows the researcher to identify real person types as occurring in nature. Two important observations are to be made with regard to this question. First, the models we proposed may be conceived as glasses through which one may look at some psychological reality; any conclusions that are drawn are being made conditionally with the glasses that have been chosen and are not to be understood in an absolute manner. Second, although the TTM does not necessarily yield person types as shaped by nature, it may be a useful and powerful tool to examine the complex interplay of persons, situations, and behaviors and to better understand the CAPS at the basis of such behavioral signatures.

It may further be clear that the TTM approach we proposed in this study may still benefit from further developments and research. First, up to now, the TTM methodology has only been applied to self-report data using questionnaires. However, in principle, the TTM methodology is perfectly applicable to data gathered on actual responses of persons in real situations or on data gathered by new methods like Ecological Momentary Assessment (Bolger, Davis, & Rafaeli, 2003). Such studies would also make it possible to validate the predictive validity of a TTM induced from self-report data. Secondly, in the present study, we examined only on-line psychological processes. However, it is also possible to study the distinctive person types of a TTM in terms of context-free, process-related, or structural person variables, as already demonstrated in earlier work (Vansteelandt & Van Mechelen, 1998). In the present study, for example, we also examined the distribution of gender across the different person types. As such, visual inspection indicates that men

appear to be underrepresented in the self-focused person type; however, because our sample is rather gender imbalanced, frequencies are too low to perform statistical tests. In future research, the TTM approach may further benefit from the inclusion of both on-line contextual processes and context-free (process or structural) person variables. Finally, it is worth mentioning that, at present, a new methodology is being developed to induce a TTM from a data set with continuous rather than dichotomous variables as included in the present study. Such an extension of the model may be fruitful because emotions like anger and sadness may vary much more in intensity than can be captured by the dichotomous response scales used in the present study.

In conclusion, the extended TTM, as presented in this article, can be considered a promising tool for studying individual differences in behavioral profiles; as such it may make the complex interplay of persons, situations, and responses amenable to empirical research, and it may truly help one understand what in the person interacts how with what in the situation (Pervin & John, 1997). Obviously, the presented methodology is well suited for investigating any behavioral domain of interest. However, as may also be clear from the present study, it requires a careful, theoretical, as well as empirical, study of the personality triad. As such, the ultimate goal is not the derivation of a small number of person types but, rather, a deeper understanding of personality.

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