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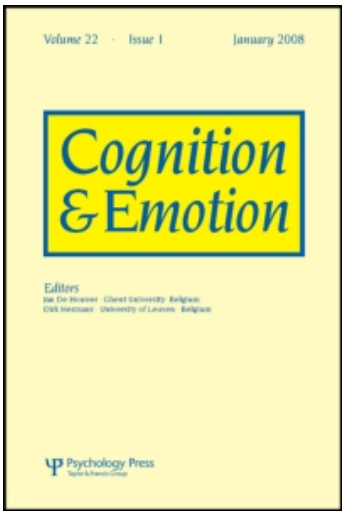

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The appraisal basis of anger occurrence and intensity revisited

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The appraisal basis of anger occurrence and intensity revisited

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In a diary study we examined the relation between anger appraisals on the one hand, and the occurrence and intensity of anger experiences in frustrating situations on the other hand. The appraisals of frustration, other presence, other-accountability, and hostile intention are shown to be jointly sufficient for the occurrence of anger experience. Absence of one or more of these appraisals further results in a smaller proportion of anger occurrences, in lower anger intensities, and in both within- and between-person differences in anger occurrence. These results are interpreted in terms of anger experience as a categorical phenomenon for which the jointly sufficient set of appraisals acts as a cognitive point of reference. Willingness to go for anger categorisations in appraisal patterns that deviate from this cognitive point of reference is, at least in part, subject to dispositional individual differences.

Keywords: Anger; Appraisal basis; Sufficiency.

Over the past 25 years, componential theorists of emotions have made clear that emotions are not to be considered unitary, monolithic phenomena. Rather, they consist of complex wholes of components, including appraisals, action tendencies, and somatic changes (Frijda, 1986; Scherer, 1984; Smith & Ellsworth, 1985). Given this postulated multi-componential nature, an obvious question that shows up is how emotion components might interrelate. The relation that has perhaps been singled out more than any other in this regard is that between the labelling of an experience as an instance of a particular type of emotion such as anger,

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guilt, happiness—i.e., in Russell's (2003) terms, a particular emotional meta-experience—and other emotion components (with for the latter much emphasis typically being put on appraisals).

Formally speaking, the labelling of some experience as an instance of some emotion can be considered a categorisation act. Any question about the relation between an emotional meta-experience and other emotion components then boils down to a question about the underlying feature or attribute basis of the categorisation in question. To clarify this further, one may make an appeal to a framework borrowed from logic. Given some category or concept, one may, on the one hand, consider all particular elements that belong to that category—technically speaking this can be referred to as the category's *extension*; on the other hand, one may also consider the set of attributes or features as associated with the category in question—technically speaking, this can be referred to as the category's *intension*. In our case, emotions or emotional meta-experiences such as anger, for example, act as categories. The actual experiences that are labelled as instances of the emotion under study then constitute the extension of the emotion category. Emotion components other than the emotional meta-experience may further figure in the role of attributes. Questions about the relation between an emotional meta-experience and other emotion components then pertain to questions about the relation between the emotion category and its intension.

As for all categories, the relation between the category label or concept (i.e., in our case, the emotional meta-experience) and the category intension can be viewed from two directions: (1) the direction from the features or attributes to the category/concept; and (2) the direction from the category/concept to specific features or attributes. The first direction applies when, for example, category membership or extensional judgements are to be made with regard to specific instances or exemplars (e.g., denoting a particular emotional experience as an instance of anger); it directly involves some category membership rule. The second direction applies when attribute information is to be derived from category membership statements; the latter is especially relevant within the context of communication; for example, when somebody tells you he is experiencing anger, this allows you to derive from this communication information on the attributes (e.g., appraisals) that apply to the emotional experience in question; as such, communicating (extensional) category membership information may be regarded as a condensed way of transferring a whole set of implied attributional (intensional) information.

Irrespective of the direction of primary interest, one may wish to characterise the nature of the relation between emotional meta-experience

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and its intensional basis.[1] Focusing, in particular, more on appraisals as emotional attributes,[2] during the past few decades several theoretical claims have been advanced. For example, Frijda, Kuipers, and ter Schure (1989) suggested that "each emotional experience is thus thought to correspond to a cognitive structure consisting of a particular pattern of values on these [appraisal] dimensions" (p. 212), whereas Roseman and Smith (2001) stated that "there should be strong and invariant one-to-one relationships between particular appraisal combinations and particular emotions" (p. 7). Sharper statements have further been made, relying on the concepts of necessity and sufficiency. For example, Smith and Lazarus (1993) stated that they "consider appraisal to be a sufficient condition of emotion, as well as a necessary one, although this latter position is clearly controversial" (pp. 234–235). Even more precisely, linking up with the so-called classical or Aristotelian view on concepts (e.g., Sutcliffe, 1993) the appraisals constituting the intension (or "core relational theme"; Smith & Lazarus, 1993) of an emotional meta-experience under study could be assumed to be *singly necessary and jointly sufficient* for that emotional experience. The latter means that, in empirical logical terms, occurrence of the emotional experience is equivalent to the occurrence of the logical conjunction of the appraisals under study.[3]

It should be noted that not all emotion theorists support the hypothesised relation of single necessity and joint sufficiency between appraisals and emotional experience. More particularly, the assumption of single necessity appears to be especially controversial: "Appraisal theorists do not assume that the typical profile is required to produce a differentiated emotional state" (Scherer, 2001, p. 373). This controversy links up with the proposal of a number of theorists to go for a prototype approach as an alternative to a classical account of emotions (Russell, 1980; Shaver, Schwartz, Kirson, &

[1] Parkinson (1997) has drawn a distinction between conceptual and empirical relations, with conceptual relations being situated on a representational level. In the present paper, we focus on empirical relations (which, unlike the attribute information in itself, should not necessarily be subject to conscious access). Note further that in the remainder of this paper we also only look at the relations in question from a static point of view, rather from the dynamic point of view of the process of emotion inference across time (Siemer & Reisenzein, 2007).

[2] In the present paper we limit ourselves to intensional or attribute information in terms of appraisals. To be sure, several authors have argued that other types of attributes should be included when dealing with the intension of emotional experiences, in particular action tendencies or action readiness (e.g., Frijda, Kuipers, & ter Schure, 1989), and, more recently, relational information that is assumed to be broader than appraisal information (Parkinson, 2007). Note, however, that our argument could be extended to these other types of attributes as well.

[3] One may note that, on top of logical equivalence, one could also make causal claims (Lazarus, 1991; Parkinson, 1997). In the present paper, however, we limit ourselves to purely descriptive logical relations.

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O'Connor, 1987). Leaving aside the extensional part of this approach (in terms of fuzzy sets and graded membership), at an intensional level it implies replacement of a conjunctive category membership rule (in terms of a set of singly necessary and jointly sufficient features) by a (thresholded) weighted additive combination (i.e., a membership rule in terms of a weighted sum of features that has to exceed some threshold value, by which most features will be no longer singly necessary: see, e.g., Hampton, 1993).

At an empirical level, the situation is somewhat confusing in that in quite a number of cases evidence is being reported in favour of some theoretical view, whereas strictly speaking this is not the case. As an example, one may refer to the simple correlations between appraisals and emotions found by Ellsworth and Smith (1988) with absolute values ranging between .10 and .43. Those are interpreted by Reisenzein (2000) as evidence against a classical view. However, mathematically speaking this is incorrect, as logical relations of necessity are not incompatible with low correlations.[4]

Somewhat harder evidence against the assumption of single necessity has been reported by Kuppens, Van Mechelen, Smits, and De Boeck (2003). In two studies, those authors made participants recall recently experienced situations in which one out of five appraisal/action tendency components (goal obstacle, other accountability, unfairness, control, antagonism) was present or absent; subsequently they had to indicate which emotions they had experienced in the situation in question. The results of those two studies showed that none of the appraisal-action tendency components under study are singly necessary or singly sufficient for the emotion of anger. As one of several possible ways out, Kuppens et al. (2003) conjectured that the failure to retrieve relations of single necessity might be due to the existence of individual differences in the relation between emotional meta-experience and other emotion components. In subsequent research, Kuppens, Van Mechelen, and Rijmen (2008), and Silvia, Henson, and Templin (2009 this issue) indeed were able to trace systematic individual differences in appraisal–emotional experience relationships (although, admittedly, the percentage of variance accounted for by such individual differences appears to be much smaller than that accounted for by individual differences in situation–appraisal relationships; see also Silvia, 2008).

Berkowitz and Harmon-Jones (2004) further present a lengthy narrative review of research showing that none of the appraisals often identified as providing the basis of anger (motivational relevance, frustration, external cause, blame, unfairness, and coping potential) are actually singly necessary

[4] When coding both (emotion) category membership and feature (appraisal) presence in a zero–one way, necessity comes down to absence of the pattern (membership = 1 and feature = 0); this implies a positive feature–membership correlation; this correlation, however, can be very low, depending on the frequency of the (membership = 0 and feature = 1) pattern.

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for anger occurrence; the only condition that finds some favour in their eyes as a spur to anger is that of "decidedly aversive conditions", irrespective of whether or not such conditions go with traditionally postulated anger-related appraisals. Otherwise, the same authors also launch the interesting suggestion that the traditionally postulated anger-related appraisals could perhaps serve to affect anger *intensity*, the latter to be clearly distinguished from anger occurrence (and even from its fuzzified counterparts, i.e., typicality or goodness-of-membership of an emotional experience within the category of anger; see Russell & Fehr, 1994).

When looking at the whole of available empirical evidence, we must conclude that the overwhelming majority of such evidence pertains to relations between single appraisals and emotional (meta-)experience. Sharp analyses of the relation between *patterns* of appraisals and emotional experiences are largely lacking. In the present paper we want to contribute to filling this gap, in particular with regard to the emotion of anger.

For this purpose, we first wanted to examine whether, for a particular set of potentially anger-relevant appraisals, joint sufficiency with regard to anger occurrence could be empirically demonstrated. To be sure, a demonstration of joint sufficiency would not constitute a "crucial test" of a classical versus a prototype view on emotion concepts, as joint sufficiency is also compatible with weighted compensatory membership rules (e.g., in the case of a membership rule in terms of a weighted sum of features that has to exceed some threshold value, every subset of features for which the sum of the associated feature weights exceeds the threshold can be considered jointly sufficient for category membership). Yet, joint sufficiency deserves to be studied in its own right, which has not been done up to now. Next to joint sufficiency, we also wanted to examine anger occurrence in the case of "incomplete" appraisal patterns, that is, in situations in which some appraisals of the potentially joint sufficient set are absent. For such situations we started by checking whether in a number of cases they also gave rise to anger experiences, herewith replicating and extending the earlier findings cited above on the lack of the single necessity of distinct appraisals for anger experience.

Second, we examined variability in anger occurrence. At this point it may be useful to revisit the old results of McCloskey and Glucksberg (1978), who set up an experiment in which they found that borderline cases give rise to both larger disagreement between subjects and to inconsistent responding within subjects (across different occasions) in membership judgements. In line with this, we examined whether incomplete appraisal patterns gave rise to both within- and between-individual differences in anger occurrence.

Third, we also wanted to examine both complete and incomplete appraisal patterns in which anger does occur with regard to the intensity of the anger experience. Linking up with the conjecture put forward by

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Berkowitz and Harmon-Jones (2004), we hypothesised that more incomplete appraisal patterns would give rise to lower mean anger intensities. Moreover, as mentioned above, McCloskey and Glucksberg (1978) reported empirical evidence in favour of higher between- and within-subject variability in membership judgements for borderline cases; similarly, Barsalou (1987) reported higher amounts of within-subject variability (across measurement occasions) in graded membership or typicality judgements with respect to borderline cases (in contrast to highly typical or atypical exemplars). Extending these findings to the case of emotional intensity, we hypothesised that incomplete appraisal patterns would give rise to higher amounts of both within- and between-individual differences in experienced anger intensities.

Provided that between-individual differences in anger occurrence and/or anger intensity were detected, as an additional and fourth research question, we also wished to examine their relationship with three trait variables: a more substantive one, distrust, and two more formal ones that relate to potential flaws in emotional information processing, alexithymia and lack of openness/need for closure. We included distrust, which in a factor-analytic study by Martin, Watson, and Wan (2000) was identified as playing a key role in a cognitive individual differences dimension of anger, with the conjecture that people scoring higher on distrust would score higher on probability of anger occurrence and anger intensity in incomplete appraisal patterns. Alexithymia is known to relate to deficits in emotional information processing, in particular also with respect to anger (see, e.g., Vermeulen, Luminet, Cordovil de Sousa, & Campanella, 2008). As a consequence, we also conjectured that people scoring higher on alexithymia would score higher on probability of anger occurrence and anger intensity in incomplete appraisal patterns. A similar prediction was made regarding people scoring higher on lack of openness/need for closure, as such people are supposed to rely more on available information by which they may tend to overlook information on absent appraisals (see, e.g., Kruglanski & Webster, 1996).

The appraisals we included in our study were: frustration, involvement of other(s), self-accountability, other-accountability, hostile intention. Except for self-accountability, all appraisals in question have shown up in a broad range of studies on anger (see, e.g., Ellsworth & Smith, 1988; Kuppens et al., 2003). Moreover, self-agency or self-accountability appears to be one of the characteristics of self-anger (Ellsworth & Tong, 2006).

The general setup of our study was as follows: Three weeks after filling out a few dispositional questionnaires, participants had to recall each evening for fifteen consecutive days a specific situation they had encountered in the past day, for each out of a series of situation frames in which the appraisals as mentioned above were present/absent according to pre-specified patterns. Subsequently, they had to report per situation whether they had experienced anger, and, if yes, at which intensity.

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METHOD

Participants

Participants were 15 male and 33 female psychology students from Leuven University, who were contacted by e-mail. Their average age was 23.5 years. Participation in the study was on a voluntary basis, and without remuneration.

Materials

Situational anger questionnaire. An experimental situational anger questionnaire was constructed with five frames of frustrating situations. Each frame corresponded to a particular appraisal pattern. To define those patterns, first a distinction was drawn between situations with and without other-involvement. In cases of no other-involvement, a further distinction was drawn between situations with and without self-accountability. Similarly, in cases of other-involvement a further distinction was drawn between situations with and without other-accountability. Finally, other-accountability could go with or without a hostile intention.

The five resulting frustrating situation frames were therefore as follows: (1) no other-involvement, self-accountability absent; (2) no other-involvement, self-accountability present; (3) other-involvement, other-accountability absent; (4) other-involvement, other-accountability present, hostile intention absent; and (5) other-involvement, other-accountability present, hostile intention present.

Dispositional questionnaires. To measure interpersonal distrust we made use of the Mistrust Scale of the Swedish Universities Scales of Personality (Gustavsson et al., 2000). This scale comprises seven items. A sample item reads: "I tend to be on my guard with people who are somewhat more friendly than I expected". The items had to be rated on a 4-point Likert scale (with 1 = "*does not apply at all*" and 4 = "*applies completely*").

Alexithymia was measured with the Toronto Alexithymia Scale (TAS-R; Bagby, Parker, & Taylor, 1994). This scale comprises twenty items. Sample items include: "I am often confused about what emotion I am feeling" and "I have feelings that I can't quite identify". The items had to be rated on a 5-point Likert scale (with 0 = "*strongly disagree*" and 4 = "*strongly agree*").

To measure openness we relied on the corresponding scale of the NEO-FFI (Hoekstra, Ormel, & de Fruyt, 1996). This questionnaire measures the dimensions of neuroticism, extraversion, openness, agreeableness and conscientiousness. It comprises 60 items to be rated on a 5-point Likert scale (with 1 = "*strongly disagree*" and 5 = "*strongly agree*").

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Finally, we also made use of the abbreviated Need for Closure Questionnaire (Kossowska, Van Hiel, Chun, & Kruglanski, 2002). This questionnaire comprises 34 items. Sample items include: "I usually make important decisions quickly and confidently" and "I don't like situations that are uncertain". The items have to be rated on a 6-point Likert scale (with 1 = "*strongly disagree*" and 6 = "*strongly agree*").

Procedure

Participants were contacted individually with the request to contribute to a study on anger in everyday life. First they were invited to fill out the dispositional questionnaires with the request to read each item carefully and then rate it honestly according to their first impression, and without skipping items. Subsequently they were informed that three weeks later they would be e-mailed on a daily basis a questionnaire to be filled out over fifteen days.

Three weeks later the situational anger questionnaire was e-mailed to the participants each day, at 8:00 p.m. sharp, for fifteen days. Participants were invited to fill out this questionnaire as soon as possible, and then to return it to the experimenter. In the questionnaire they were invited to indicate for each of the five situation frames whether it had occurred during the day in question. If yes, they were asked to recall the most recent situation of that type as vividly as possible. Subsequently they had to rate their anger intensity during the situation, making use of an 11-point Likert scale, with 0 = "*not at all angry*" and 10 = "*very angry*". Examples of the exact wording of situation frames read as follows: "Did you go today through a frustrating situation in which no other people were involved and in which you deem yourself responsible for that situation?" and "Did you go today through a frustrating situation for which you deem another person responsible, but for which you think (s)he did it unintentionally?"[5]

Out of 48 participants 37 filled out all 15 situational anger questionnaires. The remaining participants skipped between 1 and 5 questionnaires. Overall this can be considered a fairly good response rate.

RESULTS

To examine whether for the set of potentially anger-relevant appraisals under study joint sufficiency with regard to anger occurrence holds, we calculated per situation frame the proportion of anger occurrences, across all

[5] As illustrated by the second situation frame description, for frames with other-accountability present, other-involvement was not mentioned explicitly as it can be safely considered to be logically implied by other-accountability.

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participants and across all measurement occasions at which a situation of this type had occurred. For this purpose, anger was defined as a rating on the anger scale greater than zero. As an example, together all participants recalled a total of 134 situations with no other-involvement and with absence of self-accountability; in 128 of these recalled situations the anger level was rated greater than zero, which resulted in a proportion of $128/134 = 0.955$. This proportion, along with the proportions for the four other situation frames, is presented in Table 1.

From this table it appears that all proportions are high. The lowest proportion is observed in frustrating situations where other-involvement, self-accountability, other-accountability, and hostile intention are all absent; still, the proportion of anger occurrences in such situations is nonetheless sizeable, which otherwise shows that none of the four appraisals in question is singly necessary for the occurrence of anger. Furthermore, both in situations with and without other-involvement, the proportion of anger occurrences increases to the extent that more appraisals are present. Most importantly, in frustrating situations in which all four target appraisals were present (which were 126 in number), the proportion of anger occurrence was 1, meaning that frustration and these four appraisals are jointly sufficient for anger occurrence.

Second, we examined variability in anger occurrence. For this purpose we calculated per frustrating situation frame the variance between persons in within-person means and the pooled within-person variance in anger occurrence as measures of between- and within-person differences in anger occurrences. The resulting values are displayed in Table 2.

TABLE 1
Proportion of anger occurrences per frustrating situation frame across all participants and across all measurement occasions at which a situation of this type had occurred

Frustrating situation frame			
Other-involvement	*Accountability*	*Hostile intention*	*Proportion of anger occurrence*
No other-involvement	Self-accountability absent		0.955
No other-involvement	Self-accountability present		0.977
Other-involvement	Other-accountability absent		0.972
Other-involvement	Other-accountability present	Hostile intention absent	0.997
Other-involvement	Other-accountability present	Hostile intention present	1.00

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TABLE 2
Between- and pooled within-person variance in anger occurrence per frustrating situation frame across all measurement occasions at which a situation of this type had occurred

Frustrating situation frame			*Between-person variance*	*Within-person variance*
Other-involvement	*Accountability*	*Hostile intention*		
No other-involvement	Self-accountability absent		0.016	0.027
No other-involvement	Self-accountability present		0.013	0.009
Other-involvement	Other-accountability absent		0.015	0.012
Other-involvement	Other-accountability present	Hostile intention absent	0.001	0.002
Other-involvement	Other-accountability present	Hostile intention present	0.000	0.000

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From this table it appears that incomplete appraisal patterns give rise to between- as well as within-person anger occurrence variability, with higher amounts of the two types of variability showing up in more incomplete appraisal patterns (both in situations with and without other-involvement). Further, to get a better understanding of the between-person variability, we also looked per appraisal pattern at the proportions of anger occurrence for the individual persons; this made clear that the between-personal differences as summarised in Table 2 largely result from many people yielding proportions of 1 (even in very incomplete appraisal patterns), and a smaller group of participants yielding proportions lower than 1.

Third, we examined both complete and incomplete appraisal patterns in which anger occurred with regard to the intensity of the anger experience. For this purpose, we calculated for each frustrating situation frame the mean anger intensity across all participants and across all measurement occasions at which a situation of this type had occurred. The resulting means are presented in Table 3. It appears that both in situations with and without other-involvement the mean anger intensity increases when more appraisals are present, with for the situations with other-involvement the differences between consecutive appraisal patterns being significant, $t(44) = -0.377$ resp. $t(36) = -4.19$, $p < .001$, using paired t-tests calculated on the mean within-person intensities. Moreover, we also examined between- and within-person differences in experienced anger intensities. For this purpose, we calculated variances between persons in within-person means and pooled

TABLE 3
Mean anger intensity per frustrating situation frame across all participants and across all measurement occasions at which a situation of this type had occurred

Frustrating situation frame			
Other-involvement	*Accountability*	*Hostile intention*	*Mean anger intensity*
No other-involvement	Self-accountability absent		4.29
No other-involvement	Self-accountability present		4.46
Other-involvement	Other-accountability absent		4.36
Other-involvement	Other-accountability present	Hostile intention absent	5.13
Other-involvement	Other-accountability present	Hostile intention present	6.20

within-person variances in anger intensities per frustrating situation frame; those are displayed in Table 4. Unlike in the case of anger occurrence, the pattern of variabilities as displayed in this table is less clear.

Fourth, we examined the relation between individual differences in habitual anger occurrence and anger intensity on the one hand and a few trait variables on the other hand. The respective correlations are presented in Table 5. For anger occurrence, all correlations appear to be negligible, except for the correlation between distrust and anger occurrence in situations that involve another person who is not responsible for the frustration. Anger intensity in

TABLE 4
Between- and pooled within-person variance in anger intensity per frustrating situation frame across all measurement occasions at which a situation of this type had occurred

Frustrating situation frame				
Other-involvement	*Accountability*	*Hostile intention*	*Between-person variance*	*Within-person variance*
No other-involvement	Self-accountability absent		3.10	2.52
No other-involvement	Self-accountability present		2.60	2.54
Other-involvement	Other-accountability absent		2.47	2.71
Other-involvement	Other-accountability present	Hostile intention absent	2.41	3.59
Other-involvement	Other-accountability present	Hostile intention present	3.29	2.42

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TABLE 5
Correlations between, on the one hand, within-person proportions of anger occurrence and mean anger intensities per frustrating situation frame and, on the other hand, four dispositional measures

	Frustrating situation frame					
Other-involvement	*Accountability*	*Hostile intention*	*Distrust*	*Alexithymia*	*Openness*	*Need for closure*
Anger occurrence						
No other-involvement	Self-accountability absent		.23	.03	.02	.03
No other-involvement	Self-accountability present		–.02	.03	–.10	.25
Other-involvement	Other-accountability absent		.38*	.23	.07	.08
Other-involvement	Other-accountability present	Hostile intention absent	.03	.13	–.17	.10
Other-involvement	Other-accountability present	Hostile intention present	—[a]	—[a]	—[a]	—[a]
Anger intensity						
No other-involvement	Self-accountability absent		.13	.12	–.39*	.36*
No other-involvement	Self-accountability present		.36*	.28	.03	.06
Other-involvement	Other-accountability absent		.35*	.47**	.05	.01
Other-involvement	Other-accountability present	Hostile intention absent	.24	.31*	.04	.06
Other-involvement	Other-accountability present	Hostile intention present	.28	.22	.06	.09

Notes: *$p < .05$; **$p < .01$. [a]Cannot be calculated because of absence of individual differences in within-person proportions of anger occurrence.

this and other situations with "moderately incomplete" appraisal patterns further appears to be higher for persons scoring higher on distrust and alexithymia. Finally, anger intensity in mere frustrating situations for which neither the self nor somebody else can be blamed is higher for persons who are less open to novel experiences and who are more in need of cognitive control.

DISCUSSION

In the present paper, for the very first time, we have found evidence for joint sufficiency of an appraisal set (viz., frustration, other-involvement, other-accountability, and hostile intention) for the occurrence of an emotion (viz., anger). Formally speaking, the strength of this evidence can be characterised as mixed: On the one hand it is based on a (meaningful but also) lenient definition of occurrence (based on all values greater than zero on a scale ranging from zero to ten); also, the evidence was collected in a study that was announced as a study on anger in everyday life, and in which anger was the only emotion to be rated. On the other hand across a full set of 126 measurement occasions that met the full appraisal set, anger occurrence was invariably found, without a single exception. From an appraisal-theoretic viewpoint, the jointly sufficient set bears an interesting link to the core relational theme of other-blame as associated with anger by Smith and Lazarus (1993). From a more conceptual viewpoint, one may conjecture jointly sufficient sets of appraisals like the one we identified in the present study to constitute cognitive points of reference in human accounts to deal with emotions.

In addition to the evidence in favour of joint sufficiency, we also found evidence against single necessity of the appraisals of other-involvement, other-accountability, and hostile intention for anger occurrence. This evidence links up with the hypothesis and review of Berkowitz and Harmon-Jones (2004) and replicates findings from Kuppens et al. (2003). Interestingly, the occurrence of anger in frustrating situations without other-involvement and with self-accountability may be regarded as another piece of evidence in favour of the existence of self-anger, as described by Ellsworth and Tong (2006). Moreover, the occurrence of anger in similar situations but *without* self-accountability supports the conjecture of Berkowitz and Harmon-Jones (2004) about the existence of yet another form of anger (next to other-anger and self-anger), a form that one may wish to call *anger at fate*. All this could also be linked to the conjecture of Barrett (2009 this issue) that for many emotions we do not have one concept but a collection. Linguistically speaking, the full set of jointly sufficient appraisals, which may constitute a cognitive point of reference, could be thought to correspond to the unmarked variant of the concept of anger, whereas the other patterns

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may correspond to marked variants (which also appears from the experienced necessity to add, e.g., "self" in the term self-anger or in statements such as "I am angry *at myself*").

Apart from these findings on mean anger occurrence, we also studied occurrence variability. At this point the observation that more incomplete appraisal patterns not only give rise to lower proportions of anger occurrence but also to higher overall amounts of occurrence variability is not informative, as a higher overall variability can be considered a pure mathematical correlate of a lower overall proportion. However, the observation that both between- and within-person variabilities are larger in more incomplete appraisal patterns is not fully trivial. It further links up with earlier findings from Barsalou (1987) and McCloskey and Glucksberg (1978) on variability in membership and typicality judgements for borderline cases. Moreover, the existence of individual differences in within-person proportions of anger occurrence in incomplete appraisal patterns is especially intriguing. Notably, the precise form the individual differences take implies that, in terms of self-reported anger experience, many people are very tolerant in allowing for deviations from the cognitive point of reference as implied by the jointly sufficient appraisal set, whereas for other individuals this is less the case.

With regard to anger intensity, on the level of intensity means, our results fully parallel our findings on anger occurrence, with lower mean intensities being observed in more incomplete appraisal patterns. Otherwise, this may be considered support for the claim by Berkowitz and Harmon-Jones (2004) that most anger-related appraisals, although not being singly necessary for anger occurrence, do contribute to anger intensity.

With regard to variability in anger intensity, the pattern of results no longer parallels that of anger occurrence. Together with the clear differences in dispositional correlates that we found, this not only confirms the claim of Berkowitz and Harmon-Jones (2004) that occurrence and intensity are to be distinguished from one another, but also that this distinction is consequential in that it relates to different structures of within- and between-person variability.

Finally, with regard to dispositional correlates, two interesting findings emerge. First, participants who are prone to distrust are inclined to display more often and more intense anger in moderately incomplete appraisal patterns that involve an absence of other-accountability. This suggest that in such situations their dispositional inclination for distrust overrules their manifest appraisal that the other person is not to be blamed. (For safety's sake we do not want to enter the discussion whether this overruling implies some type of latent, unconscious appraisal process that deviates from its manifest counterpart!) Second, people who are less open to new experiences and who are more in need of control appear to be more prone to higher

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"fate-anger" intensities. For such people, the lack of a tangible person to which their experienced frustration can be attributed may act as an additional source of fuel for their anger intensity level.

All in all, the results on individual differences as presented in this paper nicely supplement their general psychological counterparts. Taking individual differences into account not only yields a more complete picture of emotional processes, but may also contribute to a more in-depth understanding of them. This is especially the case if sufficient attention is paid to the circumstances or contexts in which the most significant individual differences occur, as evidenced by our findings on individual differences in emotion occurrence and intensity within the context of specific incomplete appraisal patterns.

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