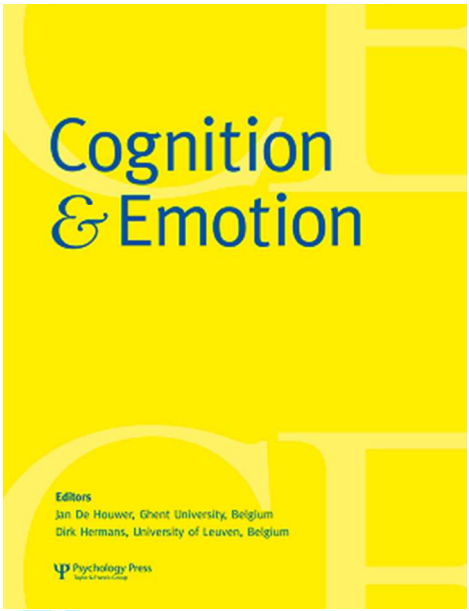

Worry Spreads: Interpersonal Transfer of Problem-Related Anxiety

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RUNNING HEAD: Worry spreads

Worry Spreads: Interpersonal Transfer of Problem-Related Anxiety

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Abstract

This paper distinguishes processes potentially contributing to interpersonal anxiety transfer, including object-directed social appraisal, empathic worry, and anxiety contagion, and reviews evidence for their operation. We argue that these anxiety-transfer processes may be exploited strategically when attempting to regulate relationship partners' emotion. More generally, anxiety may serve as either a warning signal to other people about threat (alerting function) or as an appeal for emotional support or practical help (comfort-seeking function). Tensions between these two interpersonal functions may account for mutually incongruent interpersonal responses to expressed anxiety, including mistargeted interpersonal regulation attempts. Because worry waxes and wanes over time as a function of other people's ongoing reactions, interpersonal interventions may help to alleviate some of its maladaptive consequences.

Worry Spreads: Interpersonal Transfer of Problem-Related Anxiety

Why worry? Conventional wisdom holds that some problems go away of their own accord and others persist regardless of how much we agonize or try to resolve them. Nolen-Hoeksema (e.g., 1987) argues that excessive rumination can lead to clinical depression and anxiety, and that the use of distraction often brings more beneficial consequences for well-being. If so, getting worry to do its proper job involves using it selectively on problems that are either open to alternative interpretations or susceptible to coping strategies that are not immediately obvious.

But worrying is not only about working over problems privately (e.g., Rose, 2002). It can also serve interpersonal functions. Expressing worry may serve either to recruit social support, or to alert someone else to potential threats (e.g., Ein-Dor, Mikulincer, Doron, & Shaver, 2010). In short, worrying need not only be a solitary activity, but also something enacted as part of social interaction, oriented to other people's reactions and serving relational as well as intrapsychic functions. Whether these relational functions are successfully fulfilled depends on others as well as the self.

In this paper, we sketch out a provisional account of the processes that might explain why worry spreads from one person to another (interpersonal anxiety transfer), drawing on research into social appraisal and emotion contagion (see Parkinson, 2011). We also speculate about the under-investigated process of empathic worry, including a phenomenon that we refer to as "interpersonal meta-worry": worrying about someone else's worries. Next, we consider how people's knowledge of worry's interpersonal effects may shape its strategic presentation and regulation. For example, people may suppress worry expression in order to avoid worrying someone else (interpersonal worry regulation). However, interpersonal down-regulation of this kind may misfire when the worrier believes that an impending threat warrants more serious and urgent attention than their would-be comforter's

apparently calm reaction indicates. In other words, we argue that confusion about whether worry is serving as an interpersonal warning signal about potential threats (alerting function) or as an interpersonal appeal for solace or assistance (comfort-seeking function) may lead to mistargeted interpersonal regulation attempts that exacerbate rather than alleviate the other person's concerns. Our conclusion is that fuller understanding of worry in its interpersonal context may help in the development of therapeutic tools for dealing with excessive worry and the problems it can create.

To illustrate the complexities of interpersonal anxiety transfer, it is instructive to begin with a real-world example of worry expression in the context of a marital interaction. In a recent observational study, we video-recorded parents' conversations concerning worries about their young children (see Simons & Parkinson, 2009, for methodological details). Here is an excerpt from one such conversation[1]:

1. F: I think you have (.) um (1.7) .hh a (.) phobia about formula [milk]
2. M: [well] ◦I don't want her to get a◦ big fat head – I don't have a phobia …

……..…

3. F: mm … she's only had it twice
4. M: She didn't look that fat last week
5. F: I ↑kno-ow [laughs]

……..

6. F: I am exhausted and <not having to breast-feed all the time would make me feel a lot better.> I might have some energy to [actually] …
7. M: [No you] won't. You'd be carrying a big fat baby around.

In this interaction, both parents are worried about the specific issue of replacing breast-feeding with bottle-feeding as well as more general issues concerning the development of their young baby, balancing the child's needs against own needs, and so on. Despite her concerns, the mother would like to press forward with a shift to bottle-feeding because it would allow her greater personal independence. The father is more concerned about perceived health risks of this change in feeding (at least overtly). In line 1, the mother tentatively (and after hesitation) formulates the father's worries as symptomatic of a "phobia," thus unsettling the rational basis for his anxiety by attributing it to internal dispositions (see also Edwards, 1999). However, the father counters by providing uncontested examples of apparent symptoms following the baby's exposure to formula milk, defending the reasonableness of his concern.

The two parties' overlapping concerns are dealt with delicately and with great humour, but there is also a more serious side to the discussion. The mother's worry seems to be exacerbated by the father's worries, and this makes it harder for her to reassure herself despite the light tone of the remarks. Getting him to feel less worried or seeing his worries as unfounded would help her deal with her own concerns.

Few social psychologists have succeeded in unravelling the intricacies of emotion communication and interpersonal emotional influence exemplified even in brief snatches of conversation such as the above. Some key processes have been distinguished and investigated (e.g., Butler, 2011; Hareli & Rafaeli, 2008; Van Kleef, de Dreu, & Manstead, 2010), but none of the available theories yet provides an integrative analysis of what goes on between people when worry is expressed. The present paper takes some initial steps in the direction of such an analysis by distinguishing some of the ways in which one person's worries can affect another's (see Parkinson, 2011, for a discussion of interpersonal emotion transfer including emotions other than anxiety).

Varieties of Anxiety Transfer

Our starting assumption is that emotions are forms of relational activity (Frijda, 1986) that can align and realign the respective positions of interacting agents towards objects and events in the shared field of action (*relation alignment*; e.g., Parkinson, 2008; Parkinson, Fischer, & Manstead, 2005). In particular, anxiety serves as a defensive strategy against potentially threatening objects (including other people) that may also affect other people's orientations towards those objects (and/or towards the anxious person who is apparently threatened by them). Thus, some of the interpersonal effects of anxiety (and other emotions) are emotional effects (e.g., Hareli & Rafaeli, 2008; Parkinson, 1996), and some of these emotional effects involve corresponding increases in other people's anxiety (*interpersonal affect transfer*, Parkinson, 2011). Anxiety is most likely to spread when interactants are physically and psychologically close (e.g., Hatfield, Cacioppo, & Rapson, 2004), when they are oriented towards the same objects in a shared environment (or to each other's responses to those objects), and when they share compatible goals in relation to those objects. For this reason, most of our discussion will focus on anxiety transfer in close personal relationships.

One way of distinguishing interpersonal effects of emotion is by reference to the various processes that mediate their operation (e.g., Butler, 2011; Hareli & Rafaeli, 2007; Keltner & Haidt, 1999; Parkinson, 1996; Van Kleef et al., 2010). From our perspective, an important distinction between anxiety-transfer processes concerns the role of emotional meaning and its interpretation (see also Parkinson, 2009). In some cases, exposure to someone else's apparent anxiety leads us to draw inferences about their appraisals (*reverse engineering*, Hareli & Hess, 2010), and these inferences in turn may affect our own appraisals. Because the other person seems anxious about something we may conclude that this something may threaten us too (or that the other person's reaction itself is a threat to our well-being). Alternatively, specific aspects of someone else's anxious reaction may affect

our own reaction more directly without us apprehending their significance as indications of anxiety. For example, someone's anxious glance might alert us to an object's previously unnoticed presence, or the anxious rhythm and pacing of the gestures of an interaction partner may entrain our own movements into a similarly anxious pattern (e.g., Bernieri, Reznick, & Rosenthal, 1988). Neither of these latter examples requires that we register the abstract emotional meaning of the other person's orientation.

From a relation-alignment standpoint, it is also important to consider which aspect of relational activity is affected by the other person's anxiety. In this connection, previous accounts have distinguished between object-directed and person-directed effects of someone else's emotion (e.g., Bruder, Manstead, & Erb, 2008; Steinel, Van Kleef, & Harinck, 2008). Thus, a close other's expressed anxiety may make you feel more anxious about whatever they are anxious about (object-directed effect) and/or about their well-being and ability to cope (person-directed effect). In this paper, we discuss examples of both kinds of effect. We also evaluate the extent to which apparent instances of more direct anxiety contagion depend on these object-directed or person-directed effects rather than representing a third category of effect operating directly on (initially) non-directed anxiety.

In sum, we will evaluate evidence for the following processes:

1. *Object-directed social appraisal* (e.g., Manstead & Fischer, 2001; Van Kleef, 2009; this issue): Someone else's worry may convey information about the appraised meaning of current circumstances. When this worry is specifically focused on events in the shared environment, it can communicate an evaluation and interpretation of those events, shaping own appraisals and consequently own emotion. Thus, we may become more worried about an object partly on the basis of contact with another person expressing worry. We will also consider the possibility that similar object-directed processes operate at a more implicit level when an anxious orientation

towards a potentially threatening object automatically cues a corresponding orientation in another person (e.g., Bayliss, Frischen, Fenske, & Tipper, 1997).

2. *Empathic worry*: Someone else's worry does not only communicate information about whatever they are worried about but also about the person expressing it and that person's ability to cope. Thus, instead of worrying about the object of their worry, we may worry about the impact that object is having on them (*person-directed* anxiety transfer). In some cases, such empathic worry may be based on purely altruistic concerns (e.g., when there are no ulterior motives for caring about their well-being, cf. Batson, 1987). However, empathic worry may also have an egocentric component to the extent that you worry about the impact of the other person's struggle and suffering on your own well-being (cf. Cialdini et al., 1987). Indeed, it can sometimes be difficult and unpleasant to deal with someone who is anxious (cf. Erickson & Newman, 2007). In either case, the main focus of your worry is the other person, their general state of mind or ability to cope, rather than the object or event that is the focus of their worry. Indeed, one of the things you may be worried about may be precisely the fact that they are worried: a phenomenon we refer to as *interpersonal meta-worry*.
3. *Anxiety contagion* (e.g., Hatfield et al., 1994): It often seems that merely interacting with an anxious person may make us feel anxious too, even when we are not oriented to similar objects or concerns and even when we are not personally concerned about their well-being (*non-directed* anxiety transfer). One explanation for this phenomenon is in terms of primitive emotion contagion, where we automatically mimic the other's expressions and gestures, and thereby come to feel the associated emotion (e.g., Hatfield et al., 1994). Whether such mimicry-feedback sequences characterise all instances of apparent contagion is debatable (e.g., Parkinson, 2011).

However, cases in which worry spreads without any obvious transmission of object- or person-relevant information warrant further investigation. Although emotion contagion is usually formulated as a direct response to internal sensory feedback, some theorists argue that matched emotional expressions often serve communicative purposes and are sensitive to interpersonal reactions (e.g., Bavelas, Black, Lemery, & Mullett, 1986; Hess, Philippot, & Blairy, 1998). In some cases then, what seems like primitive emotion contagion may already reflect prior empathic responses.

In the following three subsections, we discuss these processes in turn, suggesting ways in which each might be investigated further and considering their possible interrelations. In later sections, we will extend our discussion by considering up- and down-regulation of worry expression for strategic purposes, and how dyadic factors may contribute to the emergence of relational patterns of mutual worry or interpersonally discrepant emotions.

Object-Directed Social Appraisal

Object-directed social appraisal happens when one person's appraisal of something is affected by information picked up from someone else (see Manstead & Fischer, 2001). Such a process may contribute to anxiety transfer if information picked up from the other person's anxiety expression leads you to appraise the apparent object of their anxiety as more risky or frightening than otherwise.

Some of the earliest evidence for phenomena of this kind comes from Schachter's (1959) research into affiliation. He found that people anxiously anticipating electric shocks in an unfamiliar situation preferred the company of another person awaiting a similar fate. One participant explained this preference in the following terms: "I wanted to wait with other people to see how they would react while waiting for the experiment" (p. 41). Social comparisons thus provided information relevant to the issue of whether anxiety was

justifiable in the present situation. Similarly, Schachter's (1964) two-factor theory implied that people may use information available from other people to clarify the cognitive identity of emotions when internally available information is underspecified. If so, someone else's anxiety might help to define the current situation for us as one to which anxiety is an appropriate reaction.

Latané and Darley's (1968) notion of pluralistic ignorance provides another example of how anxiety-related appraisals may depend on perceptions of other people's anxiety (or lack of anxiety). The central idea is that people are often reluctant to lose composure in public and may feign calmness even in the face of potentially serious threats. However, when interpreting other people's expressions, perceivers fail to factor in the effects of this anxiety suppression to a sufficient extent, and end up being reassured about the level of danger by the apparent equanimity of those around them. Thus, experimental participants who saw simulated smoke entering a waiting room were slower to react when with other participants than when alone (Latané & Darley, 1968). Confederates specifically instructed to remain impassive had an even stronger effect on participants' speed of response. In other words, participants' appraisals of (and emotional reactions to) the incident were shaped by other people's appraisals as inferred from their level of anxiety expression. Findings from a more recent study using a similar procedure found that groups containing individuals with more anxious attachment styles (or with higher levels of neuroticism) tended to respond more quickly to simulated smoke, supporting the idea that expressed worry can alert others to danger (Ein-Dor, Mikulincer, & Shaver, 2011, and see below).

Further evidence that another person's anxiety expression can produce interpersonal affect transfer comes from social referencing research conducted by developmental psychologists. Sorce and colleagues (1985) found that one-year-old infants were less likely to cross a visual cliff towards their mother if she showed a fear face than if she was smiling.

In other words, information from the caregiver's fear expression seemed to affect the child's appraisal of danger. Subsequent studies have confirmed that infants of this age register the connection between their caregivers' displays and the objects towards which they are directed rather than simply responding with generalised affect as a result of contagion or related processes (Feinman & Lewis, 1983; Hornik, Risenhoover, & Gunnar, 1987).

Parkinson, Phiri, and Simons (in press) investigated whether similar social referencing processes characterise nonverbal interactions between adults facing uncertain situations. In their study, pairs of friends completed a modified interpersonal version of the Balloon Analogue Risk Task (BART, Lejuez et al., 2002), where one partner (player) pressed a key to pump up a computer-simulated balloon, while the other (reference person) watched via a two-way soundless video link from a separate cubicle. Points were earned as the balloon progressively inflated but were lost if the balloon burst (which happened unpredictably across trials). Reference persons were covertly instructed either to freely express or to hold back any expression of anxiety. Players pumped up the balloon less (and earned less cash) in the anxiety expression condition, but only when BART was played under a gain frame rather than a loss frame (cf. Kahneman & Tversky, 1979). Apparently, an existing orientation to potential costs diminished the impact of the other person's anxiety expression. However, reference persons' dispositional expressivity as measured by the Berkeley Expressivity Questionnaire (BEQ, Gross & John, 1995) was negatively correlated with players' risk-taking across both versions of the task, suggesting that friends showing clearer (more expressive) anxiety signals exerted stronger social-referencing effects.

Parkinson and Simons' (2009) diary research showed that object-directed social appraisal contributed to anxiety transfer in more ecologically valid settings. Participants' self-reported anxiety about impending decisions was significantly affected by the reported anxiety of another person present at the time, and this affect transfer was partly mediated by

appraisals of risk and importance. In other words, someone else's apparent worry about the potential outcomes of a planned course of action made these outcomes seem riskier and more important, and consequently increased participants' own level of anxiety.

Interview data from this and related studies revealed that participants were aware that their decision-making was influenced by the apparent worry or lack of worry of close others. For example, one male participant described how some of his friends had told him that his planned holiday destination was a dangerous place to visit alone. This led him to take certain precautions such as purchasing a padlock for securing his belongings in the hostel where he was staying. Comments such as this corroborate the results of the aforementioned partial mediation analysis, confirming that at least some social-appraisal effects operate at a conscious level. Such a conclusion raises the possibility that people regulate anxiety presentations in order to moderate their recognised impact on others (as discussed later in this article).

Future research needs to address the factors that moderate effects of another person's expressed anxiety on own appraisal and emotion (see also Hareli & Rafaeli, 2008; Schoebi, 2008). For example, what determines whether someone else's worries are treated as relevant information when evaluating and interpreting current concerns? One potentially pertinent factor concerns the extent to which another's anxiety is attributed to external or internal causes (e.g., Snyder & Frankel, 1976). In particular, anxiety signals seen as reflecting someone's internal dispositions carry fewer implications for appraisal of external objects than anxiety signals that are directly attributed to those objects. However, it seems likely that these attributional factors make less of a difference to immediate implicit reactions to another person's anxiety than to responses determined by interpretation and systematic processing.

A second moderator of object-directed social-appraisal effects is the nature of the relationship between interactants. In the examples presented above, participants had

compatible orientations to the objects of expressed anxiety and were motivated to maintain each other's well-being. By contrast, mutual enemies tend to have conflicting concerns, and their expressed anxiety may consequently lead to contrasting instead of matched interpersonal emotions. For example, anxiety expressed by a competitor may be gratifying because it indicates potential weakness that may be exploited for personal advantage (see van Kleef et al, 2010). Social appraisal is likely to have weaker effects on the respective emotions of passing strangers whose concerns neither match nor mesh.

So far, we have assumed that object-directed anxiety transfer depends on explicit interpretation of the other person's anxious orientation towards something. However, our relation-alignment perspective implies that someone else's anxiety may also shape object orientations at a more implicit level by directing attention and priming defensive responses. Bayliss and colleagues' (2007) gaze-cuing study provides an example of such an interpersonal effect using facial expressions of disgust (rather than anxiety) as stimuli. Participants were shown moving facial stimuli whose gaze turned either towards or away from adjacent simultaneously presented pictures of household objects. The facial stimuli showed either a smiling or disgusted expression. In subsequent ratings, participants showed relatively greater liking for objects that had been paired with smiling faces, but only when those faces' eyes were directed towards rather than away from the associated objects. In other words, participants made use of information from observed facial expression in appraising objects only when the emotional message was specifically oriented toward those objects (see also Repacholi & Meltzoff, 2007). None of the participants reported that their preferences had been affected by facial expression or gaze direction suggesting that the process may have operated implicitly. More recent research by Mumenthaler and Sander (2011) showed comparable implicit effects of gaze direction using fearful expressions to convey appraisals. In their study, faces influenced perception of emotional objects even

when presented briefly at the periphery of participants' visual field. Thus, the object-directedness of emotion communication seems to moderate affect transfer even when people are not explicitly processing its implications, suggesting that social appraisal can occur automatically (see Parkinson, 2011).

Empathic Worry

Object-directed social appraisal implies that we factor other people's apparent anxiety into our appraisals of objects and events. Their emotional expression provides information that affects our own orientation to something else that is happening. However, someone else's anxiety also conveys information about the person expressing it, and this in turn may make us more anxious about that person rather than the thing they are worried about. Unlike object-directed social appraisal, what worries us in most instances of empathic worry does not correspond directly to the thing that is worrying the other person. They are usually worried about something that is going to happen to them, and we are worried about how this will affect them, and whether they can successfully cope with it.

Nevertheless, to the extent that worry is associated with appraisals of uncertain coping potential (e.g., C. A. Smith & Lazarus, 1993), it remains possible that the other person is focused on their own ability to deal with a threatening object in addition to that object itself. Correspondingly, experiencing empathic worry does not rule out parallel anxiety transfer via object-directed social appraisal. We may become more worried both about the other person and about the thing that they are worrying about.

Empathic worry obviously depends on the extent to which the other person's well-being is relevant to our own concerns. Indeed, when our focus is on the indirect effects of their well-being on our well-being, the motives underlying our empathic response may be egoistic rather than purely altruistic (e.g., Cialdini et al., 1987). One of the reasons why we may care about how they feel and function is that it will also have an impact on our own

feelings (including our own feelings of anxiety). On other occasions, however, our level of identification with the other is sufficient to make us care about what happens to them regardless of whether we anticipate unpleasant personal consequences (e.g., Batson, 1987).

A special case of empathic worry occurs when the other person's anxiety constitutes the central focus of our appraisal rather than something that provides information about their general well-being. We may see the very fact that they are worried as a potential threat. Thus, their worry may be precisely what we are worried about. We refer to this phenomenon as *interpersonal meta-worry*. It probably occurs most commonly in the context of close interpersonal relationships when one person's worry expressions come to signal future trouble that will impact on the lives of both parties. In these situations it is likely that both relationship partners develop styles of intrapersonal and interpersonal anxiety regulation intended to ameliorate potential negative consequences (as discussed in a later section).

In empathic worry, our anxiety depends on uncertainty about ability to cope with the other person's future behaviour. Their worry tells us that they expect to struggle with something, and we worry that we will not be able to help them or help ourselves while they are engaged in this struggle. In the special case of interpersonal meta-worry, our worry is precisely about the fact that they (and we) may be unable to cope with their worry. Folkman and Lazarus's (1980) distinction between problem- and emotion-focused coping may help to clarify this phenomenon. Interpersonal meta-worry involves uncertainty about another person's emotion-focused (and specifically worry-focused) coping potential, or about one's own capacity to regulate that other person's worry (interpersonal worry-focused coping potential). Thus, both parties' levels of worry are also likely to depend on interpersonal feedback indicating the success or failure of intrapersonal and interpersonal worry regulation.

Processes of empathic worry and interpersonal meta-worry are not usually distinguished from object-directed social appraisal and have so far attracted little research

attention from social psychologists. However, our interview data suggest that they represent a significant category of anxiety-transfer events. For example, an adult female participant in one of our studies reported the following concerns about her parents who lived at the other side of the world (New Zealand) in an online diary:

> I spoke to Mum & Dad today (in NZ). Mum sounded really tired and stressed out, and when I spoke to Dad it really worried me. Dad had 2 strokes last year and his recovery has been great physically, but mentally and emotionally he is a different person. I always worry about Mum & Dad (but try to push it to the back of my mind because there is nothing constructive I can do from 12,000 miles away!) but when I spoke to Dad today I really felt like I should be there, giving Mum a break, and that the kids would be a great distraction from Dad's ailments. I also felt really sad because Dad could hardly hear anything the boys or I said (he is quite deaf) even though he was desperate to talk to us :(

The worries expressed in this diary entry seem to have a number of causes and objects. First, the participant is worried about her father's health. Second, she is worried about her mother's ability to cope with her father's health problems. Third, she is worried about her mother's state of mind with respect to her father's health, and specifically how worried her mother might be about this. This interpersonal meta-worry is exemplified by her consideration of ways she might alleviate her mother's concerns if she were closer at hand and able to offer emotional support. Interestingly, this participant's comments in a post-diary interview suggested that empathic worry operated bi-directionally between mother and daughter, with the mother responding to her daughter's apparent worries in subsequent phone conversations with reassurance that she is able to cope without help. In later sections of this article, we will discuss how people may actively intervene in processes of interpersonal

anxiety transfer and how reciprocal reactions of both parties to an interaction may shape the emergence of anxiety expression.

It is possible that some apparent social referencing effects may in fact depend on empathic worry or interpersonal meta-worry rather than object-directed social appraisal. For example, one of the reasons why toddlers are more reluctant to cross a visual cliff when mother looks anxious may be their desire to alleviate her apparent worried feelings rather than their own changed appraisal of the yawning precipice before them. Because emotions convey relational information, they often affect orientations both to objects and the people confronting those objects.

Empathic worry and interpersonal meta-worry may also contribute to some of the documented effects of co-rumination (Rose, 2002), a relational style in which friends work over each others' worries without searching for solutions. Adolescent female friends who score higher on co-rumination report greater relationship quality, but this comes at the expense of increased depression and anxiety (Rose, Carlson, & Waller, 2007). One reason for co-rumination's effect on anxiety may be that high co-ruminators end up worrying about another person's worries in addition to their own. Problems shared may equate to problems doubled instead of problems halved. Although co-rumination research has usually focused on friendship, similar processes may also characterise romantic partnerships and other kinds of dyadic or group relationships (e.g., Saxbe & Repetti, 2010; Schoebi, 2008; van der Löwe, Simons, Taylor, Lolliot, & Parkinson, submitted).

Co-rumination may also bring corresponding effects on object-directed social appraisal. Empathically adopting the other's perspective on a current worry may reinforce their already negative evaluation and make them see things as even more threatening. Proper understanding of the interrelated processes of empathic worry and social appraisal awaits investigation of ongoing co-ruminative interactions to supplement research that has used a

wider longitudinal time scale (e.g., Taylor, Parkinson, & Simons, 2011). Preliminary data analysis of video-recordings of relationship partners discussing worries collected as part of our research (e.g., Simons & Parkinson, 2009) suggests that worry may be met by reassurance or by shared worry, leading to different emotional outcomes. Some of these encounters strongly suggest that participants are actively trying to regulate each others' anxiety levels. Such a conclusion is also consistent with Saxbe and Repetti's (2010) finding that marital satisfaction moderates the extent of linkage between mood states and cortisol levels of relationship partners over time. Successful relationships may involve an ability to avoid getting locked into your partner's concerns (see also Schoebi, 2008).

When does empathic worry happen? According to appraisal theories (e.g., Lazarus, 1991), events must be relevant to one's own concerns in order to activate emotional reactions. Thus, someone must care about someone else's well-being in order to react emotionally to their expressed worry. Further, unpleasant emotions such as anxiety are associated with appraisals of motivational incongruence, the perception that events impede current goals or are incompatible with concerns. In other words, people are unlikely to feel bad about another person's worries if they wish that other person ill rather than good.

One of the factors that may determine whether someone else's worry leads to personal worry is social identity (e.g., E. R. Smith, 1993). Most people want the well-being of other in-group members and group leaders to be maintained or enhanced rather than reduced, and are thus more likely to react emotionally to worries expressed by those other people. By contrast, worries of competing outgroup members may be a source of Schadenfreude (e.g., Leach, Spears, Branscombe, & Doosje, 2003). The burgeoning study of group-based appraisals as causes of emotions (including fear, e.g., Dumont, Yzerbyt, Wigboldus, & Gordijn, 2002) might therefore be extended to cover group-based interpersonal meta-emotions and even group-based intergroup meta-emotions.

Of course, caring about someone else's well-being (either as an in-group member or as someone sharing an interpersonal relationship) does not necessarily mean that you react to their worry with empathic worry rather than a non-matching emotion. For example, it is also possible to be sad, angry, or even pleased that another person is worried under appropriate circumstances. For example, opponents in one-on-one competitive sports (e.g., boxers) may be motivated to intimidate opponents and may derive satisfaction when this intimidation is working successfully. Correspondingly, a close other's relentless anxiety despite our repeated efforts at reassurance and support may become frustrating. These meta-emotions too are likely to be associated with distinctive appraisals relating the other person's plight to our own current concerns. Detailing more comprehensively what determines the nature of meta-emotional reactions to someone else's expressed emotion is a potentially rich topic for future research.

In our view, the nature and extent of interpersonal meta-emotions does not wholly depend on appraisals. Our relation-alignment account implies that interpersonal meta-worry may serve as an interpersonal adjustment to someone else's self-protective orientation towards threatening events. In particular, meta-worry involves orienting in a self-protective way to the other person's worried orientation towards an object rather than to the object itself. Such an orientation may serve to encourage the other person to re-orient to their own orientation to an object previously perceived as threatening rather than to the object itself (and to engage in emotion-focused rather than problem-focused coping, Folkman & Lazarus, 1980). Indeed, expressed interpersonal meta-worry may serve to communicate to the other that there is nothing to worry about except worry itself.

Anxiety Contagion

According to Hatfield and colleagues (1994), a third way in which feelings such as anxiety spread from person to person is as a result of primitive emotion contagion. The

process has two phases: First, we automatically mimic the nonverbal behaviour of interaction partners in real time (e.g., Chartrand & van Baaren, 2009); second, internal feedback from mimicked expressions contributes to our emotional experience (e.g., James, 1890; Laird & Bresler, 1992). In the case of anxiety contagion, we may start to feel tense and worried while conversing with an anxious person partly because our facial and vocal expressions are becoming attuned to theirs as we interact. Simply speaking in anxious tones and showing worried looks may bring our emotions into line with theirs.

Consistent with the idea of primitive anxiety contagion, a number of studies have found that interpersonal anxiety transfer is not fully mediated by explicitly reported appraisals (e.g., Parkinson, Phiri, & Simons, in press), suggesting that object-directed social appraisal is not the only process in operation. Parkinson and Simons (2009) also found that another person's self-rated anxiety positively predicted own anxiety even after controlling for own perceptions of the other's anxiety. In other words, it seems that part of the anxiety-transfer process is independent of explicit perceptions of the other person's feelings, effectively ruling out mediation by emotional meaning (see also Gump & Kulik, 1997).

However, the fact that anxiety transfer can occur automatically and below the level of awareness need not be explained specifically in terms of primitive emotion contagion. Although few researchers have directly investigated primitive emotion contagion in anxiety, studies using other emotions provide little direct evidence that affect-transfer effects are mediated by mimicry and feedback processes (see Parkinson, 2011). One alternative possibility is that emotion expressions shape others' attentional activity and object evaluations more directly (e.g., implicit social appraisal, Bayliss et al., 2007, and see above).

Other apparent examples of emotion contagion may depend on empathic processes. In Bavelas and colleagues' (1986) study, an experimenter apparently dropped a heavy object on his bandaged hand in front of the participant. In one condition, this incident occurred

while the experimenter and participant faced each other; in a second condition, it occurred as the experimenter turned away. Participants winced more in the face-to-face condition. Winces in the second condition soon dissipated in the absence of eye contact with the sufferer. In this example, mimicry already depended on interpretation of the other's affective state and apparently reflected a directed attempt to communicate empathic feeling (see also Hess & Blairy, 2001).

Many studies showing that participants match perceived emotion expressions involve explicit instructions to identify the emotional meaning of the presented stimuli (e.g., Hess et al., 1998), thus potentially encouraging attempts to simulate the target's experience (cf. Niedenthal, Mermillod, Maringer, & Hess, 2010). Evidence that apprehension of emotional meaning precedes mimicry is also provided by studies in which participants' gestures correspond to the emotion that is conveyed rather than the specific physical signals used to convey that emotion. For example, Tamietto and colleagues (2009) found that stimuli depicting bodily postures associated with emotions induced facial movements in perceivers that corresponded to the same emotions. Simultaneous effects on participants' pupil size suggested that the reported mimicry depended on prior apprehension of emotional meaning. However, the process underlying this meaning-driven contagious response cannot have been conscious because the visual stimuli were presented to the blind visual field of patients suffering from blindsight (e.g., Weiskrantz, 2009). In other words, these participants were completely unaware of what they had seen. Taken together, this evidence suggests that mimicry and contagion may depend on prior empathy or embodied perspective-taking. Any resulting emotion transfer may therefore depend on these empathic processes rather than mimicry per se (see Parkinson, 2011).

Seeing apparent contagion effects as implicit forms of social appraisal, empathy or relation alignment more generally also helps to explain the selectivity and context-

dependence of these processes. Mimicry does not occur willy-nilly whenever we are exposed to someone else's emotion expression, but factors in our relationship to the other person and to the events toward which they are oriented (Hatfield et al., 1994). Indeed if the process was wholly reflexive and automatic then mutual mimicry processes would lead uncontrollably to escalating emotions in any direct encounter with another person (a resonance catastrophe). One reason why this does not happen is that responses to someone else's expressed emotions are often part of broader adjustments in interpersonal orientation that already depend on the nature of our relationship with the other and the compatibility of perspectives on events in the shared field of action. We mimic others' expressions and share their feelings because of our prior engagement with them and their concerns.

Interpersonal Anxiety Regulation

Experience with anxiety's interpersonal transfer effects (as detailed above) permits people to deploy anxiety expressions strategically in order to increase other people's anxiety. Even partial awareness of the processes underlying anxiety transfer facilitates the development of tactics for interpersonal regulation that exploit this knowledge. For example, a boss who wants to emphasise the urgency of a task and to motivate workers to immediately intensify their effort, may express anxiety that is overtly directed at upcoming deadlines to provide compelling appraisal-related information to subordinates (cf. Hareli & Hess, 2010; Van Kleef et al., 2010). Another manager might instead cultivate a less focused air of anxiety in order to exert more generalised contagion within an organization designed to motivate employees across a broader range of tasks. Finally, a subordinate may express anxiety about anticipated challenges in order to invoke interpersonal meta-worry in more benevolent managers, whose increased anxiety may motivate them to help with these challenges.

Motives for interpersonal up-regulation of anxiety arise not only in organizational contexts such as the above, but also in less formal interpersonal relationships. For example, anxiety expression is one way of communicating to someone that an impending event demands more attention and concern than the other person seems to be displaying. Strategic anxiety expression may thus occur in reaction to undue nonchalance in an interaction partner. It serves as a means of getting the other person to take things more seriously than they currently appear to be doing (see also below).

In all of these cases, anxiety expression is up-regulated at an *intra*personal level in order to achieve a corresponding *inter*personal up-regulation of anxiety. In other words, a strategic presentation of own anxiety serves to induce more anxiety in the other person. Thus, motives for interpersonal emotion regulation may activate strategic processes designed to induce the three varieties of anxiety transfer delineated above.

Gross (1998) distinguishes antecedent- and response-focused intrapersonal emotion-regulation strategies. In order to work up own anxiety to influence others' anxiety, either kind of strategy might be deployed. Antecedent-focused anxiety up-regulation might involve attending to threat-relevant aspects of the situation, or upward reappraisal of threat. These attentional and cognitive strategies serve to increase felt anxiety which is then communicated to the target of the interpersonal regulation attempt. Similar strategies are used by employees of service organizations to work up more positive emotional states in a form of emotional labour that involves deep-acting (e.g., Hochschild, 1983).

Response-focused up-regulation of anxiety works on the anxiety symptoms and expressions more directly (i.e., by surface-acting rather than deep-acting, see Hochschild, 1983). People may try to look more anxious to make another person more anxious even when not personally feeling the associated emotion. Here, it is not anxiety itself that is transferred, or at least not at first. However, to the extent that the target of a dissimulated

anxious communication reacts with genuine anxiety, interpersonal feedback may bring the regulator's experience into line over the course of the interaction. In other words, feigned anxiety may become authentic if the target's response initiates any of the anxiety-transfer processes distinguished above (see also Parkinson, 1995, for similar examples based on emotions other than anxiety).

Alerting and Comfort-Seeking Functions

The above examples imply that people may use anxiety expression strategically to influence other people's anxiety. In these cases, the presentation of anxiety is evidently oriented to others' responses and shaped by the interpersonal feedback those responses provide. In our view, a similar interpersonal orientation also characterises unselfconscious anxiety expression. Indeed, anxiety's original relational functions involve reorienting others' responses to potential threats as well as more direct defensive reactions to those threats themselves. In other words, anxiety is not only an individual reaction to situations (personally or empathically) appraised as threatening, but also serves as a means of influencing others, even when we are not explicitly attempting to achieve interpersonal influence. Thus, some of the processes that maintain and modulate anxiety across a wide range of circumstances may operate at an interpersonal rather than purely intrapsychic level (cf. Butler, 2011).

So far, our main focus has fallen on only one of anxiety's interpersonal functions. As argued above, anxiety expression may serve to alert others to potential threats, as might happen when you see someone's startled and worried expression directed toward a snake suddenly appearing behind you. Similarly, Ein-Dor and colleagues (2010) argue that individuals with anxious attachment style may serve as sentinels, allowing groups which include them as members to detect potential threats earlier than otherwise. The interpersonal

alerting function of expressed worry is served mainly by object-directed social-appraisal processes but other anxiety-transfer processes discussed above may also play a role.

A second interpersonal function served by anxiety is as a plea for comfort, reassurance, or practical support (*comfort-seeking*, e.g., Fridlund, 1994). Rather than alerting others to a threat that may affect them too, anxiety may draw someone else's attention to the vulnerability of the person expressing it. As we have seen above, one possible response is empathic worry, which may then be alleviated by deployment of interpersonal problem-focused or emotion-focused coping strategies. However, anxiety's comfort-seeking function is served equally well when other people are confident about their capacity to alleviate the anxious person's concerns and consequently experience no affective transfer. In either case, the anxiety of someone close may motivate attempts to protect or assist them or to make them feel better. For example, a child's expressed worries about the first day of school may lead to parental reassurance or promises of after-school treats.

To the extent that targets of anxious communications are sensitive to the comfort-seeking functions of the expressions they perceive, they may down-regulate their own anxiety in order to alleviate the other person's anxiety. In other words, intrapersonal anxiety down-regulation may serve as a strategy for interpersonal anxiety down-regulation. As aptly put by one of our interviewees when asked how his emotions affect his partner: "… knowing that she is much more sensitive in terms of shown emotions and getting upset, I would tend to go back to my cool mode of trying not to exhibit emotion." This participant also reported often refraining from showing emotions to his partner, even to the extent "of camouflaging, changing them" and displaying orientations that were opposite to what he really felt. The intention was to protect his partner whom he believed to be more sensitive to other people's emotions (including his own).

Correspondingly, the interpersonal alerting function of anxiety is best served if the anxious person up-regulates own anxiety expression in order to up-regulate the other person's anxiety (as discussed in the previous section). In accordance with the latter principle, one of the reasons for the operation of interpersonal anxiety transfer is that anxiety's explicit or implicit purpose is to make the other more anxious.

Mismatched Interpersonal Anxiety Regulation

In everyday interactions, there is often the potential for misreading the communicative function of anxiety expressions. For example, if anxiety is expressed as part of a strategic attempt at interpersonal anxiety up-regulation, but the receiver of the communication interprets it as an indication of person-specific low coping potential, then the response may include inappropriate attempts at reassurance instead of mutual anxiety. The unwanted calm response of the target may provoke intensified anxiety expressions from the sender who now tries even harder to get the other worried.

One of our female respondents made a similar point in a post-diary questionnaire:

> … his apparent lack of emotions affects me because sometimes it seems like he doesn't care about things that I think he should care about. Also, because he doesn't tend to worry/get upset himself, I sometimes feel as though he doesn't understand.

In this case, the participant perceived her partner to be calm and unemotional, even when confronted with events she felt he should react to. He in turn described her as a "stress-head."

In the above example, the male participant responded to the alerting function of the female participant's anxiety as if it reflected her dispositionally anxious response to the situation. Corresponding effects may also arise when comfort-seeking anxiety actually functions as an interpersonal alert. For example, if anxiety is expressed in an attempt to solicit support from other people, but those other people respond by becoming more anxious

themselves, then this might lead to a vicious cycle of two-way anxiety escalation, with the intensified worry of the recipient provoking stronger reciprocated anxiety and stronger appeals for comfort (cf. Coyne's, 1976, account of the interpersonal dynamics of depression). In this case too, ongoing reciprocal dynamics of interpersonal regulation and counter-regulation can produce undesired emotional outcomes.

In our view, similar dynamics are a common feature of interactions between relationship partners discussing shared and unshared concerns. When one partner expresses worry about a problem, the other may adopt an empathic stance and share that worry, take a more detached sympathetic position by understanding the concern but not expressing shared feelings about it, or may present an alternative appraisal of the situation implying that worry is misplaced (e.g., by expressing calm or confidence, by remaining non-emotional, or in some cases even by ridiculing the other for being unduly worried). Although each of these responses may well reflect the person's spontaneous emotional responses to the concern expressed by their partner, all of them also serve to regulate the other's emotion (see Schoebi, 2008). Further, although the particular response adopted by either person may depend both on situational factors and on individual expressive predispositions, our contention is that relationship partners can also get locked into habitual patterns of expression and response as a function of consistent relational feedback (i.e., crystallised social appraisals, self-organising systems of co-regulation, e.g., Butler, 2011; Fogel et al., 2002; Lewis, 1996). Not all of these patterns are equally successful in meeting the implicit (or explicit) regulatory goals they serve (for each partner and for the relationship more generally).

As discussed above, Rose and colleagues (2007) found that co-rumination led to higher levels of anxiety in female school-children but also improved reported relationship quality (Rose, Carlson, & Waller, 2007). Boys were less likely than girls to co-ruminate, but when they did they reported greater subsequent levels of relationship quality without any

significant changes in depression or anxiety. A "you and me against the world" mentality therefore seems to be associated with co-rumination, with both genders sharing the positive relational benefits of the alliance, but girls suffering more than boys from the associated appraisal of the external environment as antagonistic.

Corresponding gender difference may also apply within cross-gender relationships including romantic partnerships. For example, a husband might benefit more from co-rumination than his wife, but the wife may still persist with this expressive style at the expense of her affective well-being because of its perceived impact of the quality of the marital relationship. Thus, a relational interaction style may develop that benefits one partner more than the other. Further, the fact that co-rumination is more common among women suggests that there are likely to be discrepancies between the regulatory styles adopted by relationship partners (see also Zillmann, Weaver, Mundorf, & Aust, 1986). A relational equilibrium may be attained by the adoption of rumination by one partner and interpersonal down-regulation of anxiety by the other.

A second likely pattern of interpersonal emotion regulation, then, involves discrepant rather than matching emotion expression. Indeed, close relationships often seem to involve a division of emotional labour (Hochschild, 1983). In particular, one partner may take on the task of doing most of the worrying while the other may feel duty-bound to offer reassurance and express confidence (worry-calming relational pattern). Although these roles are stereotypically gender-related, in practice each may be performed by either of the sexes. Some of the apparent differences in emotional style may depend on personal dispositions, relating to trait affectivity, ruminative tendencies and so on (e.g., Robichaud, Dugas, & Conway, 2003), but they can also emerge as crystallised responses to a relationship partner's actual or perceived regulatory style. Future research should investigate the various equilibria at which couples may arrive in the practice of their individual interpersonal regulation styles

(see Butler, 2011). For example, the ruminating partner may become willing to be temporarily deflected from rumination by the calming partner (e.g., Schoebi, 2008), or alternatively may only decease from rumination once the other partner has begun to ruminate too.

The co-ruminative and worry-calming relational patterns distinguished above broadly correspond to two dyadic profiles identified by Kulik (2006). This researcher cluster-analysed relationship partners' scores on anxiety, self-esteem, and tolerance for ambiguity. Couples whose members both scored high on anxiety and low on self-esteem were characterised by lower life satisfaction than couples where the man was low on anxiety whereas the woman was high on anxiety. A third cluster including couples where both partners showed low anxiety, high self-esteem and high tolerance for ambiguity also showed higher life satisfaction. Although Kulik's study focused on individual affective dispositions rather than relational styles or patterns, it raises the possibility of distinguishing at least three different kinds of interpersonal emotion regulation operating within relationships and assessing their consequences both for well-being and relational function.

Future Research on Anxiety's Interpersonal Orientation

Most previous research has focused on anxiety's intrapersonal functions as a mental alarm system facilitating attention and action directed towards a potential source of threat in the environment (e.g., Mathews, 1990). Supplementary investigation of interpersonal functions of anxiety might adapt methods developed by Leary, Landel, and Patton (1986) for the study of embarrassment, or by Parkinson (2001) for the study of anger. In both these studies, interpersonal functions were established by demonstrating that the maintenance of the emotion in question was sensitive to receipt of interpersonal feedback indicating that its functions had been served. Similarly, interpersonal functions of anxiety could be confirmed by showing anxiety reduction when the other person responds with reciprocated anxiety.

Such research could also address the factors determining whether anxiety expression served an alerting function (as evidenced by orientation to reciprocated anxiety) or a comfort-seeking function (as evidenced by orientation to support from the other). However, interpretation is complicated by the fact that reciprocated anxiety might also exacerbate own threat appraisals. Correspondingly, apparent evidence for comfort-seeking functions may in fact reflect the direct anxiety-reduction effects of comfort provision. Further, because comfort-seeking anxiety tends to reduce the anxiety of its interpersonal target whereas alerting anxiety tends to increase it, predictions need to be acutely context-sensitive.

Conclusions

This paper has argued that worry brings interpersonal as well as intrapersonal effects, and serves interpersonal as well as intrapersonal functions. We have distinguished a number of processes whereby one person's expressed worry may spread to another person, including object-directed social appraisal, empathic worry, and anxiety contagion. Individuals may exploit these processes in order to up- or down-regulate another person's anxiety for a variety of reasons. However, interpersonal anxiety regulation is a bi-directional process and conflicting goals or interpretations may lead to mismatched regulatory styles bringing potentially negative consequences for relationships and for the individuals involved in those relationships.

Many of the conclusions presented here are based on anecdotal evidence and potentially contestable interpretations of qualitative data. However, we are confident that many of the phenomena that we have described are also amenable to more systematic quantitative investigation. Such research needs to focus not only on individual reactions to isolated, time-locked events, but also on dynamic interpersonal processes that play out over time as a function of reciprocal co-regulation. The complexities of these socially distributed systems make them empirically challenging but not intractable (see Butler, 2011). Their

understanding is crucial to a proper appreciation of the functions of worry and the development of interpersonal interventions designed to alleviate maladaptive consequences of mistargeted worry communication.

Footnote

1. Because this excerpt represents a dialogue between two participants in which paralinguistic information carries additional meaning, we have annotated it using the Jefferson system (Jefferson, 1985). The symbols indicate information such as short pauses (indicated by parentheses containing periods), long pauses (indicated by parentheses containing the length of the pause in seconds), overlapping speech (indicated by squared brackets), intakes of breath (.hh), emphasis (indicated by underlining), relative speed of speech (indicated by greater than or less than signs: >, & <), auditory volume (small circles indicating quietness), and rises and falls in intonation (indicated by upward and downward arrows).

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