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A psychological-geographical approach to vulnerability: the example of a Chinese urban development project from the perspective of the transactional stress model

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Abstract. Since the 1980s, reform, open door policy and rapid economic growth have encouraged Chinese cities to become fast-growing and highly dynamic urban areas. They are subject to both innovations and international connectivity as well as to rising socioeconomic and ecological vulnerability. This paper sketches the main transformation processes of a traditional Chinese village in the megacity Guangzhou, South China, processes that are linked to the construction of a new railway station in its close proximity. Our research addresses the issue of how the inhabitants of this village view the restructuring of their living environment. What kind of demands or opportunities do they perceive? Do they feel stress with regard to “harm-loss”, “threat” or “challenge” and how do they cope with the changing structures and processes? People living in the same environment appraise exposure to certain risks differently, which explains varying coping modes. In this context, the question is considered as to whether coping necessarily results in “visible” outcomes (e.g. building houses to rent out and thus benefiting from in-migration) or whether it encompasses “invisible” person-related processes.

The primary aim of this paper is to enrich the geographical debate on vulnerability by taking a psychological perspective and presenting and applying the transactional stress model of Lazarus. This conceptual framework from cognitive psychology schematizes person and environment antecedents of stress and coping as well as appraisal and coping as mediating processes between the person and the environment. To facilitate understanding, the transactional stress model is exemplified on the basis of selected research data collected in the transforming village. With reference to different stress appraisals, examples of varying coping modes and coping efficiency are discussed.

1 Introduction

The concept of vulnerability has been emerging as a cross-cutting theme in the environmental and social sciences since the 1980s (Chambers, 1989), in the field of geography since the 1990s (e. g. Bohle, 2007a). As the body of literature illustrates, vulnerability research covers a complex, multidisciplinary field including famine and poverty studies (Bohle and Krüger, 1992; Watts and Bohle, 1993), natural hazards (Blaikie et al, 1994; Wisner et al, 2007), global environmental change (Kasperson and Kasperson, 2001), disaster and risk management (Birkmann, 2006) and socio-ecological vulnerability in megacities (Bohle and Warner, 2008; Wehrhahn et al, 2008).

Drawing on their different backgrounds, various disciplines have developed their own conceptual frameworks of vulnerability (an overview is given by Thywissen, 2006; Bohle and
Glade, 2008). To reduce complexity and to achieve a better understanding of the multidimensional construct, some authors distinguish between social vulnerability on the one hand, which deals in the broadest sense with the susceptibility of humans and the conditions necessary for their survival and adaptation (Birkmann, 2006, page 12), and ecological vulnerability on the other, which describes the sensitivity and resistance of ecosystems to adverse effects of climate change or other environmental disturbance (Bohle, 2007b, page 24).

With regard to the concept of social vulnerability, Chambers’ (1989, page 1) definition of vulnerability refers to “exposure to contingencies and stress, and the difficulty in coping with them. Vulnerability has thus two sides: an external side of risks, shocks and stress to which an individual or household is subject; and an internal side which is defencelessness, meaning a lack of means to cope without damaging loss”. On the basis of Chambers’ definition, Bohle (2001) developed the concept of the double structure of vulnerability and emphasises that vulnerability can be seen as having both an external and internal side. While the external side involves exposure to risks and shocks, the internal one focuses on coping and action to resist and recover from the negative impacts of economic and ecological change (Bohle, 2001, page 5). The double structure image underlines the fact that vulnerability is the result of mutual processes between exposures to external stressors and the coping capacity of the affected individual or household. Additionally, Bohle’s framework includes features related to entitlement theory, human ecology, and action-oriented and access-oriented approaches. The term exposure thus goes beyond mere spatial exposure to encompass the multifaceted relationship between the person and environment.

However, some questions remain. While the external side of exposure has been discussed in detail (Wisner et al, 2007; Bohle and Glade, 2008), the internal side of coping has so far been widely neglected, especially in conceptual and theoretical terms (Bohle, 2001, page 6). The person thinks and acts and thereby changes the person-environment relationship but what exactly does it mean to speak of relationship? People exposed to the same environmental conditions appraise certain risks and chances differently, which leads to different coping behaviour. Coping is a complex, multidimensional process that is sensitive both to the environment and its demands and resources, and to personality traits and internal demands. Basically, it mediates between the individual and the environment. The essential point is the difficulty of understanding vulnerability from the standpoint of the person or the environment per se. A perspective is needed in which the two basic subsystems, person and environment, are conjoined and considered as a new condition or state. The concept of threat or shock, for example, actually loses its meaning when applied to an environment without regard to the persons who transact with it; or when it is applied to persons without regard to what it is about the environment that is threatening them (Lazarus and Folkman, 1987, page 142).

The conceptual framework of vulnerability developed by Turner et al (2003, page 8076), considered as being representative of the global environmental change community (Birkmann, 2006, page 26), accounts for the vulnerability of coupled human-environment systems with diverse and complex linkages. The framework encompasses exposure, sensitivity, coping response, impact response and adaptation, and defines these components explicitly as parts of vulnerability (Turner et al, 2003, page 8074). The framework also illustrates the interaction of the multiple interacting perturbations, stressors and stresses. Compared to Bohle’s (2001) double structure of vulnerability, Turner et al (2003) conceptualize vulnerability within a broader and closely linked human-

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(1) In psychology the term “behaviour” not only refers to stimulus-response but also to cognitive action theories (Gollwitzer and Bargh, 1996)
environment context. However, in agreement with Birkmann (2006, page 27), the question arises as to whether the distinction between drivers and consequences within the human-environment relationship is appropriate. Adaptation, for example, is seen as a consequence. However, can it not also be considered as a process that operates at any level of the human-environment relationship?

The above discussion of a number of significant vulnerability concepts has illustrated that some questions still remain. In particular, further investigation is needed with regard to issues of coping, the relationship between humans and the environment and personal factors such as attitudes or emotions that influence behaviour as well.

The debate on vulnerability and coping is interdisciplinary and includes various academic traditions from both social and natural sciences. One academic discipline, however, which addresses similar topics but has been neglected, particularly in the field of geography, is psychology. Both geography and psychology attempt to understand how human behaviour and the environment interface. The sub-discipline environmental psychology, in particular, retains a broad and inherently multidisciplinary focus in its analysis of resource management, the effect of environmental stress on human performance and the mediating psychological processes that explain why behaviour is interfaced with the environment in the way it is (Walsh et al, 2000). In general, environment from a psychological perspective is broadly defined to include not only physical spaces of all sorts, but sociocultural contexts, neighbourhoods, institutions and organizations – essentially any context in which people can find themselves (Nickerson, 2003, page 2). Additionally, a prominent place is given to the study of perceptions, personality, attitudes, personal norms and other social-psychological factors. The benefit social and natural scientists would gain from becoming more familiar with psychological research is evident, especially with regard to the debate on person-environment relationships.

2 Brief overview of current stress approaches in psychology

At a time when behaviourists dominated explanations for human behaviour, the American psychologist and critic of causal reductionism Richard Lazarus instead stressed the study of cognitive mediation and extended it into fields such as stress, emotion and coping. He is particularly well known for his theoretical schematization of stress, coping, and adaptation within the “transactional stress model” (formalized first in Lazarus, 1966; further defined in Lazarus and Folkman, 1984; Lazarus, 2006). It is “one of the most prominent stress models” (Freedheim et al, 2003, page 457) and has served as a scientific basis for a great number of psychological studies (e.g. Bamberg et al, 2003; Aldwin, 2007; Eppel, 2007). Yet why is it that a 40-year-old psychological stress concept continues to be state of the art in psychology?

According to Cooper and Dewe (2005), current psychological stress research on behaviour under vulnerable conditions comprises three main theoretical approaches that define stress either as a response, as a stimulus or as a relationship. From a response perspective stress is not considered as an environmental stressor but as a universal neurochemical set of bodily defences and processes created by a demand. This physiological viewpoint is largely based on Selye’s (1956) concept of the general adaptation syndrome which emphasized that, regardless of the cause of threat, an individual will respond with the same non-specific physiological pattern of reactions (Taylor, 2003). In contrast, life event research defines stress as an environmental stimulus (Cooper and Dewe, 2005, page 41f.). Here it is assumed that changes in one’s life, especially defeats and losses, produce psychological stress, whereby some events are generally more stressful than others. For instance, the death of a spouse is commonly regarded as more stressful than a divorce.
Several scholars (e.g. Aldwin, 2007; Monat et al, 2007; Taylor 2003), however, reflect on these two approaches critically. They argue that the response approach assigns a very limited role to psychological factors. How individuals respond physiologically to stress is considerably influenced by their personalities and perceptions. “There is evidence that not all stressors produce the same endocrinological responses.” (Taylor, 2003, page 181). Critics of the stimulus approach also note the fact that individual characteristics (e.g. emotional states, resources, coping capabilities) are widely neglected (Aldwin, 2007, page 8). With very few exceptions, no event is generally more stressful than others. The death of a spouse might cause less harm to a widower with a strong social support network than to someone with no emotional assistance at all.

Based on these critiques, approaches considering both the person and the environment comprise the third research perspective. The prominent conservation of resources theory, propounded by Hobfoll (1989) and indicative for such a viewpoint, holds that the loss of resources (e.g. objects, personal characteristics, financial conditions) is the central experience in stress – “resources not cognitions are the primum mobile on which stress is hinged” (Hobfoll 1998, page 22). Lazarus (2006), though, argues that stress is additionally related to challenges, threats or harm and indicates the importance of cognitive mediation: “The essence of my theory of stress […] is the process of appraisal, which has to do with the way diverse persons construe the significance for their well-being of what is happening and what might be done about it, which refers to the coping process.” (Lazarus, 2006, page 9, emphasis in original).

A fundamental proposition of Lazarus’ stress model is the personal meaning of the relationship that, in turn, depends on the appraisal process by means of which that meaning is constructed. According to Lazarus (2006, page 55), this meaning is the crucial cause of stress, emotion and action. In current stress research there is no comparable model that provides a similar framework for evaluating the processes of stress appraisal, emotion and coping within a transactional, relational and a process-centred and action-centred holistic outlook (Freedheim et al, 2003).

3 The transactional stress model of Lazarus

The conceptual bottom line of Lazarus’ stress model comprises five types of major variables (Table 1): person and environment antecedents of stress and coping (left), appraisal and coping as mediating processes between the person and the environment at different times (centre) and short and long-term adaptive outcomes (right). Being aware of the complexity of these issues, Lazarus employed hardly any arrows in the framework to show the directional influences of the variables and their feedback loops. He believed the forms of influence to be too multifaceted to be adequately portrayed in such an oversimplified, schematic way. “For example, appraising and coping processes influence just about everything in the system, but the specifics of this influence are not communicated by a generalized arrow or double arrow” (Lazarus, 2006, page 199).

In general, Lazarus’ frame of reference is an epistemological approach that emphasizes cognitive-relational concepts of appraisal and coping and individual differences (Lazarus, 2000, page 665). In comparison to Gidden’s structuration theory (1984) or Luhmann’s systems approach (1984), Lazarus particularly focuses on the micro-level analysis: “The person and environment interact, but it is the person who appraises what the situation signifies for personal well-being.” (Lazarus, 2006, page 12). He does not argue against the importance and influence of meso- and macro-level factors (e.g. institutions, global change) but he approaches them from an individualistic perspective.

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3.1 Person-environment relationship and stress

As mentioned earlier, the relational meaning that an individual constructs from the person-environment relationship is considered to be a core element of the transactional stress model (Lazarus, 2000, page 665). According to Lazarus (2000, page 665), that relationship is the result of appraisals of the confluence of the social and physical environment and personal goals, commitments and resources. To speak of relational meaning thus implies that the person-environment relationship is combined with the subjective process of appraising and that it is centred on the personal significance of that relationship. Lazarus emphasises that based on different personal backgrounds every individual construes his own environment thus shaping emotional and behavioural response (Lazarus, 2006, page 55, 60).

From this perspective, Lazarus and Folkman (1984, page 21) define psychological stress as a “relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being”. Using a seesaw analogy, Lazarus (1999, page 58) demonstrates the relative balance of forces between environmental demands on the one hand and the person’s resources for dealing with them on the other. If the environmental load substantially exceeds the person’s resources and in consequence disequilibrates the balance point, a stressful relationship evolves. In this sense, stress and stress-related emotions are particularly powerful when the individual must cope with demands that cannot easily be met. For instance, the emotions of anxiety or fear are more likely to occur and will be stronger when a
person believes his capacity to deal effectively with a demanding situation to be poor (Lazarus, 2006, page 60). Without a goal at stake, however, there is no potential for loss. Lazarus and Folkman (1984, page 56) point out that a person is under stress only if events negate or endanger important personal goals and commitments. This implies that not all potential stressors actually cause stress. What is appraised as stressful by one person may not be so appraised by another. “Because of different goals and beliefs, because there is often too much to attend to, and because the stimulus array is often ambiguous, people are selective both in what they pay attention to and in what their appraisals take into account.” (Lazarus, 1993a, page 7).

To emphasize that stress is neither in the environmental input nor in the person per se, but reflects the conjunction of both, Lazarus uses the term transactional stress model. He prefers the term transaction to the term interaction because, in his opinion, the latter portrays person and environment as separate entities while transaction, however, implies that the variables dialectically influence each other and thus modify their characteristics compared to the initial situation (Lazarus, 1990b, page 204). For example, a person alters the physical environment when building a hotel on former agricultural land and vice versa, the person benefits from this land use change in terms of financial profit and positively toned emotions like happiness or delight. The two basic subsystems, person and environment, are thus conjoined and considered at a new level of analysis which means that in the relationship their independent identities are lost in favour of a new condition or state (Lazarus and Folkman, 1987, page 142). Moreover, transaction implies process. The stress relationship is not static but is constantly changing as a result of the continual interplay between the person and the environment (Lazarus, 1990a, page 4). In effect, stress is a “multivariate process involving inputs, outputs, and the mediating activities of appraisal and coping; there is constant feedback from ongoing events, based on changes in the person-environment relationship, how it is coped with and, therefore, appraised” (Lazarus, 1990a, page 4).

3.2 Vulnerability
Lazarus stresses the importance of relational and transactional meaning especially with respect to the concept of vulnerability. He criticizes the fact that most often vulnerability is defined solely in terms of the “adequacy of the individual’s resources” (Lazarus and Folkman, 1984, page 50). There are indeed circumstances in which it makes sense to speak of resources. One extreme instance is when a person is below the poverty line and thus unable to buy staple foods. In this case, the poor financial situation is clearly a basic indicator of vulnerability and involves further consequences such as limited access to education or health services. However, according to Lazarus and Folkman (1984, page 50), inadequacy of resources is generally a necessary but not sufficient condition for vulnerability. A deficiency in resources makes a person vulnerable only when the deficit refers to something that really matters. For example, in the case of physical vulnerability, a broken leg raises major difficulties for a Chinese migrant labourer who is committed to making money, but has no right to salary continuation in case of illness. However, a person at a reputable desk job who is fully insured considers a broken leg to be a minor inconvenience. Hence, entitlements and access to assets (e. g. to health insurance), factors Bohle (2001) also mentions in his concept of the double structure of vulnerability, help to characterize vulnerability. The cited example demonstrates that “vulnerability is determined not just by a deficit in resources, but by the relationship between the individual’s pattern of commitments and his or her resources for warding off threats to those commitments” (Lazarus and Folkman, 1984, page 51). Lazarus thus uses a relational definition of vulnerability. In this sense, vulnerability can be thought of as potential threat that is transformed
into active threat when that which is considered of importance is jeopardized (Lazarus and Folkman, 1984, page 51). Lazarus and Folkman (1984, page 58) argue that the greater the strength of a commitment, the more vulnerable the person is to stress in the area of that commitment. Due to diverse individual commitment patterns and personal factors, even most severe crises are thus differently appraised with respect to the experience of stress. With this in mind, it is generally inaccurate to speak of stressors per se. Whether a certain condition is viewed as a stressor and upsets balance depends on the process of transaction between the person and the environment.

To discover significant factors that determine this transactional process and to facilitate understanding of stress appraisal, coping, and the function of person and environment variables as antecedents of these processes, we applied the transactional stress model to our research on a rapid urban redevelopment project in Guangzhou.

4 Empirical research in the megacity Guangzhou, South China
4.1 The new railway station in Shibi, Guangzhou
Guangzhou (Figure 1), the capital city of Guangdong Province and the largest city in southern China with approximately 10 million inhabitants, was selected as the study area. In keeping with the reform and open door policy introduced in 1979, Guangzhou was in 1984 declared to be one of the seaport cities which were to open their doors to the world market. Since then, Guangzhou has experienced rapid urbanisation and far-reaching transformations of great socioeconomic and environmental significance. Urban expansion, land-use change, inner city renewal, and in-migration processes have characterised the repositioning of Guangzhou since the adoption of reform policies.

Figure 1. Guangzhou and the construction of the New Railway Station in Shibi Village (sources: adapted from Wehrhahn and Bercht, 2008; data basis: Guangzhou Urban Planning Bureau, 2005; author’s photos, 2008/2009)
To counter increasing intercity competition from nearby cities and to improve its leading role as the regional centre in southern China, the Guangzhou government has adopted various pro-growth strategies since the late 1990s, focusing on large key projects (e.g. New Baiyun International Airport, opened in 2004) and mega-events (e.g. Asian Games in 2010) that promote economic development and create new city images (Xu and Yeh, 2005; Wu, 2007; Wu and Zhang, 2007). One project of great significance that has had a significant effect on future city development has been the construction of the New Railway Station in Shibi Village (Figure 1), 17 km south of Guangzhou’s city centre, started in 2004. The government’s aim is to meet the demands of increasing traffic and to strengthen Guangzhou’s position as a regional hub city that can compete with Beijing, Shanghai and Wuhan (Zhang and Xu, 2007). According to Liu Zhijun, Minister of Railways (status: 2004), the “New Guangzhou Railway Station will be the most modern and largest passenger railway station in Asia.” (China Daily, 2004). The station will consist of 15 terminals and 28 railway tracks with express rail links to Shenzhen, Hongkong and Macao and connections to Zhuhai (Guangdong Province), Wuhan (Hubei Province) as well as to Guiyang (Guizhou Province). When put into operation in 2010 as scheduled, just in time for the Asian Games, the New Railway Station will handle an estimated passenger capacity of over 80 million people per year (Pan et al, 2006). Parks, shopping, commercial and residential areas and station related infrastructures will shape the surroundings of the station (Pan et al, 2006). The development area spans 35 km² (Zhang and Xu, 2007, page 37), part of which is still used as farmland, and belongs to Shibi, a village that in 2008 was inhabited by about 10 000 permanent residents (villagers) and about 10 000 migrants.

The railway station project profoundly impacts on present and future spatial and socioeconomic structures and living conditions in Shibi Village. A lot of farmland has already been sold by Shibi’s village committees to the government, residents’ employment and income structures have thus changed and an increasing number of migrants have come to the village to work on the railway construction site. The development of the village to date suggests that, over time, Shibi will change from a traditional Chinese village characterised by a rural way of life to an urbanized village of predominant urban land use structures. Against this background, the research investigations presented in this paper focus on environmental change, stress appraisal and coping behaviour among Shibi’s inhabitants. What kind of demands or opportunities do the inhabitants perceive? Which impacts do they appraise as stressful and how are (different) appraisals influenced by person and environment variables? How do people cope with stressful situations so as to reduce their level of vulnerability? Coping is a complex, multidimensional process that is sensitive both to the environment, its demands and resources, and to personality dispositions, assets and internal demands.

To investigate these research questions, extensive site-inspections and 51 semi-structured face-to-face interviews were carried out in Shibi Village from 2007 to 2009. Additionally, the method of auto-photography was applied to better capture people’s emotional states and personal appraisals of their living conditions. Five interviewees were given single-use cameras to photograph anything in Shibi they related to the transformation processes and associated with positive or negative outcomes or feelings. The pictures were discussed afterwards in detail.

4.2 Person and environment variables as antecedents of stress appraisal and coping

According to Lazarus (1984, 1999), some person variables are especially important in shaping appraisal of certain events and coping behaviour – namely commitments, goals, general beliefs and personal resources (cf. Table 1). Commitments, for example, express what is important to and what
has meaning for the person and determine what is at stake in a stressful encounter (Lazarus, 2006, page 56). They influence appraisal by guiding people into and away from situations that can benefit, challenge, threaten or harm them (Lazarus and Folkman, 1984, page 57). For instance, an interviewed migrant in his mid-twenties, affected by unemployment in his home province, migrated to Shibi Village because he was committed to finding work on the construction site of the railway station. Appraisal of the threatening consequences of unemployment thus guided him away from the desperate conditions in his home region, and into a new situation that promised a chance to start over (interviews, 2009). Commitments are closely linked to choices, values and goals. The hierarchy of goals and of what a person values most or least and the probabilities and costs of implementation determine the choice of goals that a person will strive for in any given transaction (Lazarus, 2006, page 71). The migrant’s objective of improving his financial situation and living conditions in general shaped his appraisal so that he considered migration to be the best solution. However, it has to be pointed out that not everyone who has similar commitments is able to migrate. General preconditions (e.g. connections, knowledge) are required.

Beliefs about the world refer to how people conceive themselves and their place in the environment (Lazarus, 2006, page 71). “Beliefs are personally formed or culturally shared cognitive configurations” (Wrubel et al, 1981, quoted in Lazarus, 1994, page 63). According to Lazarus and Folkman (1984, page 63), beliefs serve as a “perceptual lens” and shape expectations about what is likely to happen in an encounter. In appraisal, they determine what reality is and how the environment is construed. The extent, though, to which people feel confident of their powers of mastery over the environment influences whether an encounter will produce threat, harm-loss or challenge appraisals. People with an internal locus of control, for instance, believe that events can be influenced by their behaviour. They are more likely to appraise a demanding and ambiguous encounter as controllable and less threatening or stressful than people with an external locus of control (2). The latter regard events as not contingent upon their actions, but upon luck, fate or destiny (Lazarus and Folkman, 1984, page 66). The Chinese migrant, from the example above, felt that he mastered his environment. He actively changed his life situation by migrating to Shibi. In comparison, a 45-year-old villager who fears unemployment and financial insecurity would not make any effort to seek a new job because in his opinion destiny is outside his personal control (interview, 2007). It seems likely that his way of thinking is rooted in the times before 1980, when the village committee used to assure rural employment for everyone (3). In general, considering different loci of control contributes to an understanding of why some people display coping efforts while others do not.

Personal resources determine whether needs and goals can be attained and influence what people are able or unable to do. According to Lazarus (1999, page 71), personal resources include intelligence, education, wealth, health, social skills and sanguinity. If a person has a goal at stake but lacks sufficient or appropriate resources to achieve that goal, stress will be experienced in compliance with the transactional stress-theory. In this sense, internal demands refer to important goals, commitments or tasks, the postponement or unattainability of which have negative implications (Lazarus and Launier, 1981, page 227). For example, the aforementioned migrant would have felt stress if he had failed to realize his goal in finding work on the railway construction site. Vulnerability derives not only from exposure to external events but also from internal demands.

(2) Several studies that have analysed genetic and environmental antecedents of locus of control estimate the genetic influence at between 10% and 55% (Gale et al, 2008).

(3) Rofel (2007) focuses on the issue of generations and different world views in China.
and goals. This issue is not taken evidently into account in Bohle’s (2001) double structure of vulnerability or in Turner et al.’s vulnerability framework, but its consideration deepens understanding of vulnerability factors. Based on the research investigations, the majority of the interviewed villagers want to stay in Shibi although the railway station is being constructed. However, they fear resettlement due to the pending demolition of some parts of the village. “So far the village committee hasn’t yet informed us about the houses that have to give way to the railway station but they must know about the future plans. (…) We don’t want to be relocated. I’m so anxious about the future” (interview with a middle-aged woman, 2009). This statement illustrates the uncertainty and stress which the villagers have to deal with. This uncertainty and stress increases levels of vulnerability as villagers have a significant goal at stake but have no guarantee of achieving it and no available resources with which to try. “There is nothing we can do about it but hope” (interview with a 30-year-old man, 2009).

According to Lazarus’ stress model, social demands, constraints, temporal aspects and resources such as a social support network refer to substantive environment variables that – like person variables – anteced and shape stress appraisal and coping behaviour (cf. Table 1). Social demands consist of pressures from the social environment to act in prescribed ways (Lazarus, 2006, page 61). They can be implicit or explicit and mainly relate to social conventions. A contradiction between a person’s goals and beliefs and external demands can create severe conflicts. The parents of a 23-year-old migrant, for instance, blamed him for leaving his family and migrating to Shibi Village and hence abandoned him and his wife. “I felt myself in a no-win situation. It was the dilemma of either migrating and offending the family’s feelings or staying back home being unemployed” (interview, 2008). The migrant decided to move despite the negative consequences. However, his younger brother cancelled his plan to accompany him. This example additionally illustrates the influence (familial) demands can have on people’s behaviour.

In comparison, constraints formally define what people should not do or what they are punished for (Lazarus, 2006, page 62). Lazarus (1999, page 63) argues “whether the constraints pose a conflict depends on the fit between the needs of the individual and the values of the institution”. For instance a migrant’s commitment to living to Shibi Village can be constrained by the Chinese household registration system (hukou) which impedes uncontrolled relocation. Migrants usually need to have a temporary residence permit that allows them to live somewhere other than in their hometown. One interviewed migrant did not possess such a permit. In Shibi Village, however, the supervising procedure by the village committee has been ambiguous and lacked transparency (interviews, 2008/2009). Sometimes residential status is strictly controlled, sometimes less so, and there have been cases where being unable to prove possession of a temporary residence permit had no consequences. Thus, the fit between the migrant’s needs and the values of the institution can change at any time. A stressful situation evolves when the village committee sharpens controls.

Additionally, appraisals of threat, harm-loss and challenge are influenced by temporal aspects. Imminence, for example, refers to the period of time before an event occurs (Lazarus, 1994, page 92). If there is enough time to make necessary arrangements in case of land use change, for instance, and to avert significant harm, the incident might be experienced as less threatening. Due to increasing sales of farmland by Shibi’s village committees, unemployment and informal income structures have been rising. In the early stages of the railway station construction, a 35-year-old woman and her husband anticipated losing their steady income from agricultural land use and hence invested their savings in rebuilding their house (interview, 2009). Since 2006, they have been
renting the four extra floors to migrants and can basically live on the rental income. “We were lucky to foresee the development [of the village] and to realign in time. (…) I endorse the [railway station] project because it makes more migrants come to Shibi and people like us can make a living by renting rooms to them” (interview, 2009). The woman’s statement demonstrates how the concurrence of financial resources, temporal aspects and, finally, successful assimilative behaviour leads to positive-benign appraisal. Obviously, it is not only resources that make people automatically less prone to stress.

In summary, the cited examples illustrate that personal factors always include references to situations and vice versa, situations always refer to personal characteristics. As already emphasised, Lazarus views the person and environment variables as interdependent. There is always an implied “to” – that is, a personal commitment is related to something, thinking and acting are related to environmental conditions (Lazarus and Folkman, 1984, page 55). People think and act and thereby change the person-environment relationship. Primary and secondary appraisal and different modes of coping are thus the two key processes mediating this relationship (Lazarus and Folkman, 1987, page 145).

4.3 Different modes of appraisal and coping

Under comparable conditions, people differ in their sensitivity to certain types of events, as well as in their interpretations and reactions. The person and environmental variables that influence appraisal have been discussed. However, in order to understand variations among individuals, Lazarus and Folkman (1984, page 23) stress the need for taking into account the cognitive processes that intervene between the person and the encounter. The way a person construes an event shapes the behavioural and emotional response (Lazarus and Folkman, 1984, page 24). According to Lazarus (1999, page 75), people constantly evaluate what is happening to them with respect to its significance for their well-being. “Whether and how we cope with demands flows from this appraisal, as do the qualities and intensities of the emotions we experience.” (Lazarus and Folkman, 1987, page 145). In comparison to the term “perception”, cognitive appraisals connote an evaluation in a personal sense focused on meaning and significance. This distinction emphasizes appraising “as a set of cognitive actions, a process performed by an individual who may not have been conscious of doing it” (Lazarus, 2006, page 75). In addition, emotions are involved in the process of appraising. If a person appraises his relationship to a certain event in a particular way, a specific emotion, which is tied to the appraisal, will usually follow unless the appraisal is changed by cognitive coping processes (Lazarus, 1990a, page 12). An emotional reaction (e. g. fear, anger, shame etc.) thus indicates that an important commitment or goal has been engaged and demonstrates how the person interprets the encounter (Lazarus, 2006, page 87).

Lazarus and Folkman (1984, page 31) distinguish between two appraisals of stress – primary and secondary appraisal (cf. Table 1), each of which has a different function and deals with different sources of information, although the two operate interdependently and can appear simultaneously. Primary appraisal refers to the evaluation of whether what is happening is relevant to one’s values, goals, beliefs and commitments. “Am I in trouble or being benefited, now or in the future, and in what way?” (Lazarus and Folkman, 1984, page 31). According to Lazarus and Folkman (1984, page 32), a person may consider a given event to be either irrelevant, benign-positive or stressful. Appraisal of a situation as irrelevant means that the person does not consider it to have any implication for his or her well-being. Thus nothing is to be lost or gained in the person-environment transaction. For example, a 27-year-old migrant who was interviewed seemed not to
care about the impacts of the railway station project. He worked in a clothing factory and stated: “In case of resettlement or rent increase I just move to another place. (...) I am not attached to the village. As long as I have work I can be happy everywhere” (interview, 2008). In comparison, benign-positive appraisals occur if the outcome of an event is construed as positive and promises to enhance well-being. No coping effort is required, but the person experiences positive emotions such as happiness or exhilaration (Lazarus and Folkman, 1984, page 32).

Stress appraisals are of three kinds and include harm-loss, threat and challenge. Harm-loss relates to damage that has already occurred. The most demanding events are those in which major commitments are lost and essential goals are endangered. A 34-year-old villager expressed her feelings of harm and sadness within the frame of auto-photography. She took a photograph of parts of the former agricultural area that is now mostly being used for the construction of the new railway tracks (Figure 2). “A lot of villagers have lost their basic source of income and haven’t received enough compensation payments from the village committee. How shall they make a living if not from farming?” (interview, 2008). The interviewee is concerned about the future development and the villagers’ living conditions. She relates increasing crime and drug abuse to the rise of unemployment and insecure income structures.

Figure 2. Conversion of farmland into developed sites for the railway station project in Shibi Village (source: photograph taken by an interviewee within the auto-photography investigation in Shibi Village, 2008)

Threat, however, concerns harm or loss that has not yet happened but is anticipated (Lazarus, 2006, page 76). In comparison to harm-loss, threat permits anticipatory coping. Thus people are able to anticipate future occurrences and have a chance to plan for them and to prepare themselves for approaching difficulties (Lazarus and Folkman, 1984, page 33). “We save as much money as we can because we fear resettlement and don’t expect to receive sufficient financial support from the village committee. (...) If we face demolition we want to have the ability to build a new house”, argues a 30-year-old resident who is threatened by not knowing what is going to happen in the near future (interview, 2009).

Challenge, the third type of stress appraisal, focuses on the potential for gain or growth inherent in a situation. To be challenged implies feeling positive about demanding events and refers to pleasurable emotions such as eagerness or excitement. Lazarus and Folkman (1987, page 145) see challenge as a stress appraisal because the person must mobilize coping efforts in order to
produce a positive outcome. Additionally, there must be some risk of harm to have the experience of challenge. To supplement her family’s income, a woman in her late forties recently opened a small kiosk “because more and more migrants are coming to Shibi and demand products for daily use (interview, 2009). She is aware of the risk that more kiosks may be established soon and compete with her own business, but she is nevertheless eager to meet the challenge. Her optimistic attitude has been the basis for actively influencing her present living conditions and benefiting from the in-migration process.

In addition to the stakes a person has in an encounter, evaluations are required about whether anything can be done to manage or improve the troubled person-environment relationship, and if so, which coping options might work. Lazarus and Launier (1981, page 238) call this type of evaluation secondary appraisal (cf. Table 1). It applies to a complex process that considers both modes of coping and the likelihood that a given coping option will accomplish what it is supposed to. Lazarus (1999, page 78) points out, however, that decisions about coping actions vary in accordance with changing conditions and available resources. Based on reappraisals which refer to a modified appraisal due to new information or feedback from the environment, new coping options are taken into account (Lazarus and Launier, 1981, page 241). Considering this issue, Lazarus and Folkman (1984, page 141) define coping “as constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person”. Their definition contains a process-oriented approach and implies a distinction between coping and automatised adaptive behaviour by limiting coping to demands that a person considers as taxing or exceeding his or her resources (Lazarus and Folkman, 1984, 141f.). During an encounter the person discovers the realities of a stressful situation from a subjective perspective and evaluates coping options. From Lazarus’ (1993b, page 372) research standpoint, coping is thereby regarded as independent of the outcome which permits coping to include anything the person does or thinks, regardless of how successful or adaptive it is. To clarify this distinction, Lazarus (1999, page 111, 114) differs between coping functions on the one hand, which refer to the purpose certain behaviour serves, and coping effects on the other, which focus on the outcome. By using the word “manage”, Lazarus and Folkman (1984, page 141) additionally emphasize that coping does not necessarily mean mastering. “Managing can include minimizing, avoiding, tolerating, and accepting the stressful conditions as well as to master the environment.” (Lazarus and Folkman 1984, page 142).

An important feature of Lazarus’ conceptualization of coping is that it involves more than just problem solving. He distinguishes between two major coping functions – namely problem-focused and emotion-focused coping (Lazarus, 2006, page 114). The function of problem-focused coping is to change the reality of the person-environment relationship by acting either on the environment or oneself. It is aimed at managing or altering the problem causing stress (Lazarus and Folkman, 1984, page 159). In comparison, emotion-focused coping is directed at regulating emotional response to the problem – for instance, by avoiding thinking about the threat or reappraising it – without changing the reality of the stressful person-environment relationship (Lazarus, 1993b, page 374).

In relation to the appraised impacts of the railway station project, research results indicate that emotion-focused modes of coping are more likely to occur when there has been an appraisal suggesting that nothing can be done to change harmful, threatening, or challenging environmental conditions. For example, denial (“Shibi hasn’t changed yet and won’t change in the future.”), distancing (“I’m too old to worry about any consequences.”), wishful thinking (“All of us will
become rich because Shibi is transformed to a city with many job offers.”) or interpreting an occurrence as an opportunity for personal growth (“Dealing with such a situation [losing farmland] makes you stronger and ingenious at finding your way out.”) characterise those interviewees who either lack access to appropriate resources or who are not aware of possible coping options (interviews, 2008/2009).

Problem-focused forms of coping, however, dominate when stressful encounters are appraised as amenable to modification or controllable by action. To illustrate, the example of the interviewed migrant who came to Shibi for employment reasons demonstrates problem-focused coping by influencing the reality of the stressful situation (unemployment) through migration to Shibi Village (coping). Nonetheless, research results indicate that a lot of interviewees generally display both coping functions. This is in line with Lazarus’ position: “The key point is that in nature the two functions of coping are seldom if ever separated. Both are essential parts of the total coping effort, and ideally, each facilitates the other.” (Lazarus, 2006, page 124). For instance, a woman in her sixties deeply suffers from agonising uncertainty about whether some houses in Shibi have to be demolished. For the sake of clarity, she seeks out the village committee at least every six months and asks for detailed information about potential relocation planning. “However, without success. I am always told that they don’t know anything either but I will keep asking them. (...) I’m not afraid of moving, I just need to know what’s coming up for me in the future so I can calm down” (interview, 2008). Her coping behaviour, which can be subsumed under the category of “information seeking”, has the function of providing a basis for action intended to manage a stressful situation, but it also makes her feel better by making the transaction seem more under control (Lazarus and Launier, 1981, page 252). This example illustrates that coping is a significant mediator of the emotional outcome of a stressful encounter. The emotional state at the beginning of a stressful occurrence has changed by the time the occurrence reaches its end. As soon as the woman knows more details, her emotional state will change from anxiety to relief. Each emotion provides different information about how a person has appraised what is happening and how the person is coping with it (Lazarus, 2006, page 36). “In effect, each emotion has a different scenario or story about an ongoing relationship with the environment” (Lazarus, 2006, page 36). In Lazarus’ opinion stress and coping can be regarded as reciprocals. “When coping is ineffective, the level of stress is high, when coping is effective, the level is apt to be low” (Lazarus, 2006, page 102). This thesis, however, raises the question as to what is meant by ineffective or effective coping? And what actually constitutes effective appraisal?

4.4 The efficiency of stress appraisal and coping

From Lazarus’ and Folkman’s point of view (1984, page 185), neither a personal nor an environmental perspective alone is sufficient for the study of effectiveness, since coping mediates between the person and the environment. Efficiency thus depends on the type of person, the kind of stress, the stage of a stressful encounter, and the outcome modality – that is, in accordance with the stress model: psychological well-being, health and social functioning (Lazarus, 2006, page 111).

The effectiveness of a certain mode of coping depends on the extent to which it is appropriate to the internal and/or external demands of a situation. Coping that is effective in one situation can be ineffective in another, and vice versa. The example of denial illustrates this point. If nothing can be done to alter a stressful situation, denial can be beneficial. However, if denial prevents a person from trying more productive coping behaviour in a situation that can be improved, it has negative consequences. In general, there is no such thing as universally effective or
ineffective coping. “It is the fit between thinking and action – that is, the balance between them and the environment realities – which makes coping efficacious or not” (Lazarus, 2006, page 124).

In any stressful situation, the demanding task for the person is to make a series of realistic judgements. Primary and secondary appraisal must approximate the flow of events. According to Lazarus and Folkman (1984, page 186), there are two different types of mismatch between appraisal and what is actually happening: either a person appraises stress in terms of harm, threat or challenge in cases where they do not apply; or the appraisal reflects a failure to recognize harm, threat or challenge in instances where they should be recognized. In addition, a mismatch between primary appraisal (e.g. “There is threat.”) and secondary appraisal (“What can I do?”) is likely to reduce coping effectiveness due to an inappropriate choice of coping modes (Lazarus, 2006, page 122).

Whether coping is successful or unsuccessful can only be judged by taking into account the situational context in which the person is operating, including existing constraints, institutional conditions, resources, norms and expectations, and subjective standards in terms of successful coping (Lazarus and Folkman, 1984, page 192, 196). Indeed, there are certain stressful conditions that call for a specific solution. For instance, if a house is on fire, it is necessary to control emotions of panic and to call the fire department immediately. However, for many other stressful encounters, the solution is anything but straightforward. Acknowledging the complexity inherent to coping and stress research in general, Lazarus (2000, page 672) emphasizes that instead of seeking universal ways of dealing with stress, it is necessary to consider individual differences that affect the choice of optimal ways of coping. Against this background, Lazarus (2000, page 672) defines effective coping in terms of the quality of fit between the person and environmental demands. He considers this relationship “as constantly changing: in effect, as a process that depends on shifting work demands and settings and fluid personal outlook” (Lazarus, 2000, page 672). In accordance with Lazarus’ point of view, the research results in Shibi indicate that those interviewees with an internal locus of control, access to appropriate resources and an awareness of realistic coping options are more likely to deal with demanding situations. They actively change their person-environment relationship and readjust their coping behaviour to changing conditions. In comparison, interviewees with an external locus of control or a mismatch between coping options and secondary appraisal are more likely to experience vulnerability. However, it needs to be emphasised that general statements concerning levels of vulnerability are hard to make. It is always the individual and his personal relationship to the environment that have to be taken into account.

5 Conclusions

The overview of Lazarus’ transactional stress model and the presentation of its main features provide an insight into different aspects of psychological stress research. Referring to Bohle’s (2001, page 6) comment with regard to having thus far neglected the internal side of vulnerability in research, Lazarus’s conceptual framework helps to enrich the debate on vulnerability and coping from a psychological perspective. He differentiates between primary and secondary appraisals, discusses personal and environmental variables as antecedents of appraisal and coping processes and stresses the importance of a transactional view of the relationship between the person and the environment. In comparison to Turner et al (2003, page 8076) who distinguish in their conceptual framework of vulnerability between drivers and consequences within the human-environment relationship, Lazarus (1990a, page 4) forbears from defining any concrete influences between the variables involved in the overall process of stress appraisal and coping. His research approach
considers the role of mediating processes and points out the importance of individual characteristics and emotional factors.

Within the scope of empirical research in the megacity Guangzhou, the transactional stress model provided a useful basis for analysing different modes of stress appraisal and coping resulting from changing socioeconomic and spatial structures and processes. It became evident that personal and situational factors always determine whether the relationship between a person and the environment is appraised as stressful. The level of vulnerability depends both on the goals and commitments an individual has, as well as on his or her resources for warding off threats to those goals and commitments. Thus a deficiency in recourses increases stress appraisal only when the deficit impacts on an important personal goal. Bearing this in mind aids understanding of variations between Shibi’s inhabitants both in terms of their appraisals of the impacts of the railway station project (primary appraisal) and in terms of their coping behaviour (secondary appraisal).

This paper aims to make evident the benefit social and natural scientists can gain from becoming more familiar with psychological research, and to tear down existing communication barriers. An interdisciplinary approach is needed in which insights and theoretical backgrounds from psychology are combined with those from other disciplines to further concretise the concepts of vulnerability and coping. The application of the transactional stress model to research questions related to the field of human geography well illustrates one way to meet this challenge.

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