

Social support schemas, trait anger, and cardiovascular responses

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Abstract

This study examined the influence of activated support schemas on cardiovascular reactivity (CVR) during an anger-recall interview. Eighty Chinese female undergraduates wrote about a supportive tie or a casual acquaintance and subsequently disclosed an anger-provoking event while their heart rate (HR), systolic blood pressure (SBP) and diastolic blood pressure (DBP) were measured. Compared to participants in the ‘acquaintance’ condition, those in the ‘support’ condition showed lower HR, SBP and DBP reactivity, as well as smaller state anger increases and less negative appraisals of the recalled anger event. Reactivity increased as a function of trait anger. High trait anger individuals also had greater increases in state anger and more negative appraisals of the recalled event compared to their low trait anger counterparts. Support schema activation reduced the effects of trait anger on CVR such that high trait anger individuals in the ‘support’ condition had significantly lower CVR compared to high trait anger individuals in the ‘acquaintance’ condition. These findings suggest that social support schemas may have beneficial effects even in the absence of actual, enacted support.

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Our social relationships are known to have important health effects. Low social support as well as social isolation has been shown to increase cardiovascular (Berkman and Orth-Gomer, 1996; Krantz and McCeney, 2002; Orth-Gomer, 1994) as well as all cause mortality (Berkman, 1985; Berkman and Syme, 1979). Positive social relationships are generally believed to have protective influences on health through buffering effects, in other words, by protecting people from the potentially pathogenic influences of stressful events (Schwarzer and Leppin, 1991). Support is postulated to reduce the subjective experience of stress by reducing threat appraisal and negative affect and also enhancing coping ability during stressful situations (Pierce et al., 1997; Sarason et al., 1991). This, in turn, is postulated to reduce physiological reactivity during times of stress (Uchino et al., 1996).

Most laboratory studies examining the effects of support on CVR have either manipulated actual support, manipulated availability of support or measured perceived social support

(see Thorsteinsson et al., 1998; Uchino et al., 1996). Several studies have found that the presence of a supportive other attenuates CVR to laboratory stressors (cf. Gerin et al., 1992; Kamarck et al., 1990; Lepore et al., 1993) although this has not been shown in all studies (cf. Lepore, 1998; Sheffield and Carroll, 1994). This may suggest that actual support in the form of the presence of supportive others may not always be an effective stress buffer.

It is also clear that not everyone benefits equally from the presence of others. In particular, individuals high in hostility may not show the same benefits as those who are low. Such individuals are more easily provoked (Dill et al., 1997), show greater trait anger (Bishop and Quah, 1998; Smith and Pope, 1990) and have a greater tendency to display an antagonistic interaction style (Smith and Pope, 1990), thereby eliciting negative responses from close others and potentially fostering an unsupportive and conflict-prone social environment. This, in turn, elicits more angry emotions and aggressive behaviors from these individuals that can further undermine existing interpersonal relationships. This may also affect CVR in stressful situations. For example, Lepore (1995) found that whereas individuals low in cynicism, a key component of hostility, showed reduced CVR to a speech stressor when in the presence

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of a supportive confederate, this was not true for those high in cynicism.

A substantial body of research has also shown that *perceptions* of support may be a more reliable correlate of health outcomes than actual, enacted support (see [Pierce et al., 1997](#), for a review). Cognitive perceptions of support are very much influenced by one's schemas regarding interpersonal relationships and supportive ties. Mental representations of social support and interpersonal relationships are commonly referred to as *relational (or support) schemas* ([Baldwin, 1992](#)). When activated, these schemas may alter threat appraisals, mood and coping ability during times of stress ([Pierce et al., 1997](#); [Sarason et al., 1991](#)), which, in turn, can help reduce the physiological concomitants of stress. Moreover, support schemas are continually available in memory. Hence, when activated, their effects on physiological reactivity may be more enduring and relevant to long-term health as compared to actual, enacted support ([Bloor et al., 2004](#)). It is also likely that the actual presence of supportive others may have effects on physiological and psychological responses to stress beyond the cognitive activation of these support schemas. In particular, people respond to the specific characteristics and behaviors of the other person which, in turn, are likely to influence their psychological and physiological responses.

People internalize their interpersonal experiences forming mental representations of support ties ([Pierce et al., 1997](#)). These internal representations of support/social relations (relational/support schemas) develop through recurring patterns of interpersonal interactions ([Baldwin, 1992](#)). Hence, individuals high in hostility or trait anger may develop support schemas that reflect negative interpersonal interactions, unsupportive others, and an unfavorable self-schema. As such, their mental representations of support are likely to be less positive. In line with this, [Gambone and Contrada \(2002\)](#) found that individuals high in hostility gave significantly higher anger ratings for their closest friends compared to low hostile individuals. By contrast, individuals low in trait anger or hostility are more likely to interpret social stimuli more positively ([Lakey and Cassidy, 1990](#)), hold positive views of others ([Sarason et al., 1991](#)) and display social competence ([Procidano and Heller, 1983](#)), thereby eliciting complementary reactions from others and subsequently fostering a positive social environment. This, in turn, evokes continued positive behaviors and thoughts about others on the part of individuals low in hostility or trait anger. The latter are, therefore, likely to internalize relations with others in a positive way, forming support schemas that reflect positive interpersonal experiences, supportive others and a favorable self-schema. As such internal representations of support are likely to be positive.

In the laboratory the activation of support schemas can be achieved through subliminal priming or conscious reminders such as recall exercises ([Bargh and Chartrand, 2000](#)). Though their activation cannot be observed directly, the effects of their activation can be studied by comparing relevant physiological and/or psychological responses in different activation conditions. Once activated support schemas may act as stress buffers in ways similar to actual enacted support ([Pierce et al., 1997](#))

with the former attenuating CVR through similar mechanisms as the latter. These activated mental representations may influence current perceptions of social support, which in turn affect mood and threat appraisals during a stressful event as well as CVR. Along these lines, [Smith et al. \(2004\)](#) recently demonstrated that when research participants are instructed to think and write about socially supportive others their HR and BP are reduced in the face of a stressful speech task as compared with participants told to think and write about an acquaintance. However, the positive effects of support schema activation on DBP were found in non-hostile, but not hostile females. [Smith et al.](#) concluded that the relatively negative support schemas of hostile individuals rendered their activation less effective in attenuating CVR to the speech stressor. It was also found that low hostile individuals in the support-activation condition showed a significant decrease in state anger whereas high hostiles in the same condition showed a slight *increase* in state anger. These results demonstrate the differential effects of support schema activation on CVR among low and high hostile individuals.

The current study examines the generality of findings on the effects of support schema activation by testing these in an Asian population and using a different stressor than that used by [Smith et al.](#) The results by [Smith et al. \(2004\)](#) were obtained with a predominantly Caucasian sample. Although we would expect similar results in an Asian sample, studies of CVR in response to laboratory stressors have found significant ethnic differences (cf. [Bishop and Robinson, 2000](#); [Why et al., 2003](#)) and thus generality of these findings between groups cannot be assumed. Also this study uses an anger-recall task instead of a speech task. Laboratory tasks often produce very different patterns of CVR and through somewhat different mechanisms (cf. [Hurwitz et al., 1993](#); [Kasprovicz et al., 1990](#); [Llabre et al., 1998](#)). As indicated by the results obtained by [Smith et al. \(2004\)](#) for psychological measures, the preparation and delivery of a speech appears to be more anxiety than anger arousing. By contrast, the anger-recall task is designed to be specifically anger arousing, and, in fact, participants engaging in anger recall show increased anger on completion of the task (cf. [Why et al., 2003](#)). As such we would expect the anger-recall task to be an even more relevant stressor as it is more closely related to hostility and trait anger. Finally, we used trait anger as our individual difference variable rather than hostility. Psychometric evaluation of measures of hostility and trait anger in Singapore has found the best validity and reliability for trait anger and cast doubt on the reliability and validity of questionnaire measures of hostility ([Bishop and Quah, 1998](#)). Although hostility and trait anger are distinct constructs they are closely related both psychometrically ([Bishop and Quah, 1998](#)) and hostility is believed to have much of its effects through the greater proneness to anger on the part of high hostiles ([Smith, 1992](#)).

The current study tested two primary hypotheses. Our first hypothesis was that activated support schemas would attenuate heart rate (HR), systolic blood pressure (SBP) and diastolic blood pressure (DBP) reactivity during the anger-recall interview. Second, we expected this difference would be restricted to low trait anger individuals. In other words, we expected an interaction between schema activation and TA such

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