Constructing the Self:
Conversations and Cardiovascular Reactivity

A thesis presented in partial fulfilment of the requirements for the degree of Doctor of Philosophy in Psychology at Massey University

Antonia Catherine Lyons

1996

155.2
Lyo

DC 20

Abstract

This thesis develops a theory suggesting that the cardiovascular reactivity exhibited during language use is explicable in terms of self-construction processes. Social constructionist ideas regarding the constructive nature of language were drawn on to outline the ways in which individuals obtain and maintain a sense of self in conversations and other episodes of language use. Three factors regarding conversations were identified as central to self-construction processes, namely the context in which the conversation occurs, the content of the language used, and the resources the individual brings to any particular talking episode. This conceptual scheme was then used to interpret and integrate many diverse findings regarding cardiovascular reactivity, resting blood pressure and cardiovascular disease.

Based on this theoretical account, it was hypothesized that conversations about the self would be related to greater cardiovascular reactivity than conversations not focused on the self, and further, that conversations about private aspects of oneself would be related to greater cardiovascular reactivity than conversations about public aspects of oneself. The magnitude of differences in reactivity across the three conversations were expected to depend upon various resources the individual brought into the situation, especially their private and public self-consciousness, social competence, tendency to disclose, usual extent of conversations and their usual comfort felt during conversations. To test these hypotheses an experimental procedure was developed where participants had their blood pressure and heart rate monitored every minute (for approximately 35 minutes) by an automatic blood pressure monitor. During this time they were engaged in three conversations with the researcher about private self, public self, and non-self topics. This procedure was subsequently used on 102 women who, following the experiment, completed a questionnaire which included measures of the relevant individual resources.

Results showed that as predicted, blood pressure was most reactive when participants talked about aspects of their private self, and least reactive during non-self talk. Heart rate, however, was most reactive when participants talked about aspects of their public self. Of the individual resource variables, usual extent of conversations and usual comfort of conversations modified the differences in reactivity across the private self, public self and non-self talking conditions, both separately and in combination. Differences in diastolic blood pressure and mean arterial pressure reactivity across the

three conditions depended on both the usual extent individuals engaged in conversations and how comfortable they usually feel doing so. Unexpectedly, when these resources were considered, reactivity observed during public self talk was significantly different from reactivity observed during either private self or non-self talk.

Overall the results broadly supported the present self-construction account of cardiovascular reactivity during language use. They also highlighted the importance of conversational resources, most notably usual extent and comfort of conversations, in affecting cardiovascular reactivity during any specific conversation. The thesis concludes with some reflections on social constructionist ideas, the realist paradigm, and the nature of language in cardiovascular reactivity research.

Acknowledgements

Table of Contents

List of Appendices

List of Tables

List of Tables

List of Figures

Introductory Overview

A well-documented psychophysiological phenomenon has become apparent in the previous two decades. Researchers have consistently demonstrated that whenever a person speaks, whether in conversation or alone, the cardiovascular system increases in activity. Blood pressure and heart rate rise as soon as speech is initiated and remain at these higher levels until speech ceases, when they return quickly to their previous levels. However, this phenomenon is not well understood at present. Research shows that the cardiovascular activity is not due to the motor movements required to produce the speech sound. In fact, the same responses occur while deaf people communicate in sign language, and while people write. Why the cardiovascular system is so responsive to speech and communication is currently a matter for speculation.

The aim of my thesis is to focus on this puzzling phenomenon and to suggest a conceptual scheme that is able to integrate diverse empirical findings in the psychophysiological literature regarding cardiovascular changes during talk and communication. The conceptual scheme draws on social constructionist ideas to make sense of the phenomenon. It treats language use as the primary aspect of the physiological findings, and uses the constructionist notion that when people use language they are constructing a sense of self. The constructionist perspective (outlined in Chapter 1) helps to make sense of the cardiovascular reactivity phenomenon with the idea that self-construction processes during language use are reflected in cardiovascular activity. This perspective also makes sense of various empirical findings regarding cardiovascular reactivity, namely the diverse range of psychological and social factors that have been found to influence the extent of cardiovascular activation whenever a person speaks (Chapter 2). The proposed conceptual scheme also receives support through its ability to integrate some of the empirical findings regarding resting blood pressure levels and cardiovascular disease, as well as more general findings on health and illness (Chapter 3).

1

Following the conceptual outline and theoretical integration of physiological, psychophysiological and epidemiological findings, a number of hypotheses are derived from the theoretical framework. These are outlined and detailed, with theoretical and empirical justification (Chapter 4). The remainder of the thesis concerns the experimental test of these hypotheses.

Prior to carrying out the main study, a pilot study was undertaken to investigate various conceptual and practical issues regarding the research design, the experimental procedure and the measurement of cardiovascular reactivity. These issues are outlined and the method and results of the pilot study are provided and discussed (Chapter 5). The experimental test of the hypotheses derived from the present theoretical account is described, including its method and the results obtained (Chapter 6). These results are discussed in relation to the theoretical framework in Chapter 7, along with possible problems with the study and possibilities for future research. Finally, as this thesis drew on ideas from social constructionism yet tested these ideas in a realist paradigm, a number of issues are raised. These issues, as well as the nature of the current endeavour, are reflected on in the final chapter.

Chapter 1

Language and Self

The limits of my language mean the limits of my world   (Wittgenstein, 1922)
My language is the sum total of myself   (Singer, 1984)

The assumption that language operates as a mirror of the world has been strongly questioned in recent decades. Traditionally, language has been seen to operate as a simple medium of communication, able to map or picture reality through the use of words. However, there is now an awareness that language is much more active than this, with inherent constructive properties. Words are understood as gaining their meanings through use in social interaction, rather than being considered neutral tools by which to communicate. Thus, language is no longer seen as capable of mirroring reality, but by its very nature and pervasive use, as constructing that reality.

This shift in the perspective on language has been gaining momentum throughout various academic disciplines, including literary theory, philosophy, anthropology, cultural psychology and social psychology. It is particularly important for psychology, where the main subject of study, the individual, begins to be questioned. This view on language does not relinquish the concept of an 'individual' or the 'self', but does question traditional views on the fundamental nature of the self and mental life in general. For example, is the self an entity or a linguistic and social construction, created in relationships with others via language? Do the 'inner contents' of individuals (e.g. emotion, memory, personality) exist independently of the ways in which they are talked about, used and objectified in language?

The self that appears from this shift in perspective is one that is a process and product of language and relatedness. Such a conception of self does not rest easily with more traditional, modernistic views of the world where the individual is central in experiencing reality with mental states and inner contents, nor with romanticist notions of a deep and profound inner self. Similarly, this conception has difficulty residing

with the physical world of the person, where physiological functioning is traditionally viewed as an independent, real and 'individual' system. However, this new 'related self' produced through language can provide us with a useful way of reconceptualizing health, illness, and psychophysiological processes.

My aim in this chapter is to provide an overview of the nature of language in the postmodern era, and what this means for the concept of self. This will provide a basis for a conceptual scheme useful in understanding certain psychophysiological phenomena. Arguments against the notion of self as an independent 'given', and for the notion of self as a construction of linguistic and social practices will be provided. Emphasis will be given to self-construction processes during particular language episodes, including the importance of the content, context and speaker of any utterance.

The Nature of Language

It was traditionally assumed that language was able to communicate whatever was intended, and to do so in an accurate and simple way. However, strong critiques of this view have been voiced in recent decades, and for many such a view of language can no longer be sustained. What, then, is the nature of this alternative view of language? To express something to another person we must resort to a shared, intersubjective medium: it is necessary to use language. Language is intersubjective, generalizing across people and situations, times and spaces (Semin, 1990). In this way it is inherently social, embedded in human interaction (Luckmann, 1983) and is the prime human system of social exchange (Harré, 1984). Thus, language enables communication and interaction. But it does more than this: all language use reproduces the rules governing that language use and the meanings within the language. These meanings are shared - we share them in order to communicate, and in using them, their meaning is reproduced and validated (Wittgenstein, 1967). If the rules and meanings of language are created during use, they are created in the social world. Any specific instance of language use is then governed by these rules and

meanings of language. This perspective on language means that intersubjectivity precedes subjectivity when we talk or write (Semin, 1990).

The philosopher Wittgenstein has been a major influence in the position that words gain their meaning through their use in social interaction: use determines meaning, meaning does not determine use (Bloor, 1983). He has argued that words are used not because they accurately 'map' something in the world, rather the way in which words are used in social life provides them with their meanings, and they are employed for these very meanings. Wittgenstein uses the term 'language games' to refer to the sort of things habitually said between individuals. This term highlights the fact that the *speaking* of language is part of an activity or form of life. He extends these ideas so that language games include not only spoken exchanges but all forms of sign-based activity. As meaning is created purely by acts of shared use, Wittgenstein argues that the speaking practices of groups of people are intimately related to the social fabric of such groups. Language games are not just the property of groups and institutions, they are the expressions of those groups and institutions (Wittgenstein, 1967). The idea that social order is inherent in discourse is shared by many other writers. It is more or less taken for granted among French philosophers in the structuralist tradition, and a number of theories and methodologies have this idea at their base. For example, Austin and Searle's speech-act theory emphasizes the agentive character of utterances, viewing language as a rule-governed, institution-bound form of intentional behaviour (Totman, 1985), while ethnomethodology, ethogenics, discourse analysis and feminist theory all provide implicit support for the position that there is an equivalence between systems of talk and the institutions of social life.

On this view, language actively creates and produces the social practices of a culture and the rules of society. It is the means of establishing, sustaining and changing the social order. Language, or forms of talk that people share, gives the rules and institutions of socialness (Totman, 1985). Yet language not only constructs social structures and practices, it also serves to construct the self. What we currently call psychological knowledge (including personality, memory and emotions) can now be

seen as a product of social interchange, and therefore the understanding of individuals necessarily requires an understanding of social context (Gergen, 1987). Social constructionism is the current term given to the position that language, as a human symbolic activity, constructs our social and psychological realities. This view highlights an awareness that our world is understood through terms in language, and these terms are social artifacts that have been produced in historically situated interchanges among people (Gergen, 1985). Therefore, we can view ourselves as living in realities that are constituted by the words that we use to describe them (Leary, 1994).

The Nature of Self

There is increasing agreement among anthropologists, linguists, sociologists and some social psychologists that personhood (including all aspects of being a person and experiencing a sense of self) is a sociocultural product, mediated by the underlying principles and structures of a particular social system (Sampson, 1983; Totman, 1985; Shotter, 1993a). This replaces the traditional view that humans have a basic and fundamental nature, a self that lies deep within the person (a romanticist view), or a self which possesses inner properties and mechanisms, such as self-esteem, self-schemas and so on (a modernist view) (Gergen, 1991). Rather, our sense of self is derived from continuous interactions and relatedness with others. As such, it is flexible, being part of an ongoing social process.

There is an inextricable link between one's notion of self and one's social experiences (Lykes, 1985; Harré, 1984, 1991). This view is not of recent origin. In 1934 Mead argued that individual identity originates in social processes (1967), and similarly in 1902 Cooley noted that there is no sense of 'I' without its correlative sense of 'you', 'he' or 'they' (1967). If we contend that language constructs our social and psychological realities, then there is no longer any pre-existing individual, but one who emerges through social life and linguistic practices. This is supported by research showing that the concept of self is contingent on social, cultural and historical contexts

6

(Verhave & van Hoorn, 1984).

The Changing Nature of Self in Western History

Many have argued that the individualized person represents a "particular epoch within the history of personhood" (Gadlin & Rubin, 1979, p. 221, cited in Sampson, 1983). Baumeister (1987) reviewed the history of the self and argued that it was not until the sixteenth century that a "concept of the unity of the single human life emerged" (p. 163). Others disagree on exactly when the emergence of the more modern form of individualism took place. According to Sebba, "the breakdown of the medieval world view initiated a radical change in the Western concept and experience of self" (1972, p. 452). Autobiographies and the appreciation of the concept of 'I' have been said to have emerged in the twelfth century (Parker, 1989). However, it appears that there has been a progression from a group-based identity to individualism at some point between the Middle Ages and the Renaissance/Reformation period. Since then there has been an increasing and relatively intense concern with the self (see Sampson, 1988; Logan, 1987).

Logan (1987) distinguishes five eras in which the concept of self underwent change in Western culture. In the later Middle Ages, he argues, the sense of self as a subject emerged, an awareness of a separateness from a larger whole. During the Renaissance individuality was asserted but there was remarkably little self-reflection or self-consciousness, which increased during the seventeenth and eighteenth centuries when there was an awareness of an inner thinker and an outer, stable and natural world. In the modern world of the nineteenth century emerged the full development of self-as-object, with an emphasis on an inner life and introspection. In the post-modern culture, Logan claims, the self is an existential and alienated concept, which needs to be created by the 'I', or self-as-subject.

Interestingly, Verhave and van Hoorn (1984) have related the radical changes in self to changes in social and psychological views on time. During the medieval period, which was 'timeless' in that nothing changed but a cyclical seasonal time existed, the

soul was an eternal entity that lived beyond the material world. Since the mechanical clock, the self became more private and subject to the quantified time of the marketplace. In the contemporary, pluralistic world, time is multidimensional, as is a sense of self, constrained by a multiplicity of social contexts and a product of social interaction. Thus, Verhave and van Horn argue that the concept of self changes in relation to concepts of temporality, and more generally, that each different societal context (e.g. technological, economic) produces qualitatively different and thus uniquely new kinds of selves. Moreover, the self does not only vary across historical societal contexts, but also across different contemporary societies.

The Cultural Nature of Self

Anthropological evidence demonstrates that the concept of the self varies cross-culturally (see Shweder & Bourne, 1984; Csordas, 1994; Mead, 1967; Cooley, 1967; Luckmann, 1983). For example, in both Tahiti and Bali the self is perceived in terms of unique contextual features rather than in an abstract way (Levy, 1973; Geertz, 1975, both cited in Shweder & Bourne, 1984). Thus, selves are not considered individuals but as part of social life in terms of relationships, social placement and location within an eternal order. Similarly, the Oriyas of India talk about themselves and others in much more concrete ways than do people in Western culture. Personal and concrete accounts are given based on behavioural instances that have occurred in the past, rather than dispositional descriptions (Shweder & Bourne, 1984). Munro (1977, cited in Hampson, 1988) has discussed the Chinese concept of self, where there is no notion of a private, inner world. Thoughts are viewed as promptings to act, and therefore are inevitably made public through behaviour. In a study that examined the notion of self across Indian, Japanese and American cultures, Roland (1991) found that individuals do develop a self universally, however the qualitative nature of this self and its importance vary. He showed that the individualized self dominated in the American culture, whereas familial and spiritual selves were more central among Indians and Japanese.

Findings such as these have led Sampson (1983, 1988, 1989) to strongly argue that

8

the current Western version of personhood as a self-contained, integrated whole is not only not an absolute, but actually unusual. This taken-for-granted, self-evident phenomenon, as the present overview suggests, is a sociocultural, rather than a natural event. The dominant Western view of a person as an autonomous individual who is responsible for his or her actions is, compared to most of the world's cultures, peculiar. As Geertz (1984) has stated, "The Western conception of the person as a bounded, unique, more or less integrated motivational and cognitive universe, a dynamic centre of awareness, emotion, judgement and action, organized into a distinctive whole and set contrastively against other such wholes and against a social and natural background, is however incorrigible it may seem to us, a rather peculiar idea within the context of the world's cultures" (p. 126).

Shweder and Bourne distinguish two contrasting conceptualizations of the individual-social relationship across cultures, namely the "egocentric cultural", where the self is an autonomous individual, and the "sociocentric organic", where the focus is on the collectivity. These are, they point out, not individual perceptions but "creations of the collective imagination" (p. 193). However, Lykes (1985) has argued that these conceptualizations are not exclusive, but best understood in relation to one another in terms of social relations, with the unity being one of the self as an ensemble of social relations.

Others have looked at how the self is referred to specifically in language use and found there are differences in the use of personal pronouns across cultures. Chang (1988, cited in Csordas, 1994) discusses language in Korea, where verb forms indicate the status of relationships between the speakers so strongly that personal pronouns are no longer of any use. In the use of language, therefore, there is no individual. Berman (1992) has discussed a similar situation in Javanese-Indonesian conversation, where there is no use of 'I' and communal identity is affirmed through 'we'. He concludes that "discursive styles of self-presentation in Javanese-Indonesian speaking communities are not centred on the speaker as a unique, responsible being symbolised by linking one's discourse to an agentic 'I'" (p. 13).

Self and Language

Social constructionism has amplified the foregoing ideas, arguing that selves, persons and other psychological phenomena are social and historical constructions. They are derived and reinforced in our social life through language. As Wittgenstein, Ryle and others have argued, those aspects that are considered central to a sense of self, including mind, emotion and personality, can be viewed as discursively constructed in the social world. Linguistic philosophers such as Ryle (1949) take this idea further, claiming that much, if not all, of the phenomenon of the mind is intersubjectively constituted as the person engages in different forms of language use. For example, Wittgenstein questions what sorts of things mental terms stand for: does an emotion term, such as fear or anger, have a referential base? As we cannot answer this question through empirical observation of mental entities, but still have a shared understanding of fear, or anger, he posits an alternative way of accounting for this understanding, namely through use-derived meaning. Gergen (1995) eloquently explains this in the following way: "mental predicates acquire their meaning through various language games embedded within cultural forms of life. Mental language is rendered significant not by virtue of its capacity to reveal, mark or describe mental states, but from its function in social interchange" (p. 3).

Emotions are an important aspect of our self experience, and have been said to "form a frame of reference for self-definitions" (Gerhards, 1989, p. 750). Although many psychologists believe that emotions are biological givens, historians and anthropologists have established that there are historically and culturally diverse emotion vocabularies, and that emotions can be viewed as embedded in the discursive practices of a culture (e.g. Lutz, 1988). Csordas (1994) reviewed some recent anthropological findings and highlighted the diversity of emotion experience across cultures. For example, Rosaldo (1980, cited in Csordas, 1994) discusses one of the most basic emotion states experienced by young males in the Ilonget people of the Philippines, *liget*. She describes liget as similar to anger and passion, and showed how the development of the self is understood as maturing from the youthful state

10

dominated by this emotion to one dominated by knowledge. Therefore, rather than non-cognitive, biological phenomena, emotions can be seen as a form of social role (Averill, 1982; Harré, 1986), or as Rosaldo (1984) argues, should be seen as "embodied thoughts". Researchers have also demonstrated that the referents of emotion words shift over time. For example, Stearns and Stearns (1988, cited in Harré & Gillett, 1994) showed that in the seventeenth century, emotions such as anger referred to the actions of large groups (the 'angry' crowd) rather than to the internal, private feelings of individuals. Harré (1986) has argued that the personal experience of emotion is strongly tied to the local language and the local moral order. Others see emotion as constructed in interaction, produced in attempts to make sense of the world and through which people construct and evaluate selves (Crawford, Kippax, Onyx, Gault & Benton, 1992).

Other aspects of the self can also be viewed as constructed within our talk and interaction. Harré (1989) argues that through our shared cultural linguistic resources and everyday talk we produce the concepts of action and agency, while Brandstädter (1990) makes the same argument regarding lifespan development. Edwards (1991) also argues that cognitive categories are not pre-formed but are produced in talk to accomplish social action: they are something we *do*. Memory is also constrained by the language of the culture, for when we make memories available to ourselves or others, we must do so in this language. According to Gergen (1991), language sets limits on what can legitimately count as memory. Such a view has led Middleton and Edwards (1990; also Edwards, Potter & Middleton, 1992) to provide a discursive psychology of remembering. Further, our notion of personality is embedded in language. Our descriptions or characterisations of persons are configured on everyday language, and Semin (1990) points out that even researchers deriving scientific personality theories rely on everyday language. Similarly, Hampson (1988) has asserted that personality is a product of a person's behaviour and how this behaviour is construed by others as well as by the self. By construing personality in these terms, we may be said to be adopting a social constructionist account. In a similar manner, we use linguistic practices in daily life to make sense of our own and others' actions,

and a sense of self is dependent on these linguistic practices (Potter & Wetherell, 1987). More radically, perhaps, some theorists argue that the experience as well as the concept of consciousness is a product of language and society (Volosinov, 1994).

The importance of language for social identity is highlighted by sociolinguistic researchers, who argue that social identity, gender and ethnicity are in large part established and maintained through language (Gumperz & Cook-Gumperz, 1982). The study of language as interactional discourse has demonstrated that parameters such as gender, ethnicity and class are not constants that can be taken for granted, but are communicatively produced (Frazer, 1989; Gumperz & Cook-Gumperz, 1982). Identity can only be expressed through the categories available to us in discourse (Frazer, 1989). Ochs (1993) has emphasized this discursive aspect of social identity, asserting that linguistic constructions at all levels of grammar and discourse are crucial indicators of social identity for people as they interact with one another, and at the same time, social identity is "a crucial dimension of the social meaning of particular linguistic constructions" (p. 288). Our understanding and experience of our social identity, the social world itself, and our place in it are discursively constructed (Frazer, 1989). However, while language use creates a social identity for the user, this is a reflexive process. Language use not only creates but also identifies social group membership (Jupp, Roberts & Cook-Gumperz, 1982). In summary, therefore, social identity is produced in our talking lives. In a similar fashion, others argue that personal identity, or the singularity of selfhood, is equally a product of these discursive practices (van Langenhove & Harré, 1993).

Constructing a Sense of Self in Conversation

It is in and through language that the self is generated (Kerby, 1991). However, it is not language as a formal system that is of interest in this process, but rather language as it is used by people in speech and interaction (Sampson, 1993). Harré (1983) proposes that an interpersonal conversation is the fundamental psychological reality, and it is here that an individual's self is said to evolve (Luckmann, 1983; Shotter, 1993b; Harré, 1993). This self is not a prerequisite for engaging in social interaction,

12

but emerges from and is sustained by people's conversations (Sampson, 1993). Individuals are "constituted and reconstituted through the various discursive practices in which they participate" so "among the products of discursive practices are the very persons who engage in them" (Davies & Harré, 1990, p. 46).

The view that conversation is the main sphere in which the self emerges has been outlined by Sampson (1993) in his dialogic account of human nature. He describes the important features of conversation that need to be considered in taking this perspective. Firstly, conversations occur between people, and even when we think we do so in the form of a dialogue. Secondly, conversations are public rather than personal or private, using a system of signs that is shared. Thirdly, there is addressivity in conversations, such that one person addresses a conversation to another person in a particular situation. Finally, conversations encompass verbal, non-verbal, symbolic and written material, such that even the writer and the reader can be seen as engaging in a conversation. Based on these features of conversation, Sampson argues that we are conversation beings, and that human life (mind, self and society) can be found in processes occurring between people in their daily lives.

Thus far little attention has been paid to the language user, and it must be recognised that any use of language belongs to a 'voice'. Social constructionists are less concerned with the voice, or the speaker, as they are concerned with the broader psychological, social and political implications and consequences of the language use itself. However, I would like to employ constructionist notions to focus on the individual language user, and the consequences of any act of language use for the speaker. By focusing on the individual, however, I do not intend to deny the social nature of this individual. Yet in the present sociohistorical and cultural location, we do have a sense of an individual self. As van Langenhove and Harré (1993) point out, a sense of self can be viewed as a theoretical entity; each person is in command of a theory which has a sense of self as a central concept. This sense of self is accomplished during discursive acts by the person using the language, and the 'self' discussed by social constructionist theorists is easily understood by readers for it is a concept that all participants in our culture share. It is the construction process of this

13

'sense of self' as an individualized, bounded and unique person that I would like to focus on.

The construction of a sense of self is not achieved by individuals in isolation, it is a continuous process that "requires complicity, negotiation and collusion" (Gergen, 1984, p. 100). It is important to note that these are terms that refer to relationships, not individuals. Thus, individuals negotiate their sense of self through engagement in conversation. However, according to the postmodern Zeitgeist, we do not direct or produce the ways we understand our lives, and we are also subjected to regimes of meanings (Lather, 1992). Nevertheless, we do engage in producing a coherent and continuous sense of self through discourse (Lather, 1992). The notion that a sense of self is an ongoing accomplishment achieved through language is emphasized by Sampson (1993). His view is that "any apparent singularity of personality is an ongoing accomplishment of certain social forms and practices. If we experience a core self, this is not because we have a core, but rather because we function in a society in which that formulation has become a dominant belief that is usually reaffirmed by everyday social institutions and cultural practices" (p. 112)

Various authors take the perspective that all meaning, including the meaning of one's self, is based in language and social process (e.g. Mead, 1967; Bakhtin, 1986; Wittgenstein, 1967). From this perspective it is inevitable that constructing a sense of self must be seen as an ongoing accomplishment of this process. Such an ongoing process implies that all episodes of language use are similar for self-construction processes. However, while all language use is involved with producing a sense of self, some episodes may be more central to self-construction processes than others. There are two identifiable features of language use that can be viewed as influencing how central that language is for the user's sense of self, namely the specific content of the language and the context in which the language is used.

Language Content

At the individual word level, we have already seen how important pronouns are for constructing the self across various cultures. Pronouns are the main grammatical devices through which any act of language use is tied to the language user (Mühlhäusler & Harré, 1990), and it is particularly through personal pronouns that we "reproduce ourselves as individual persons" (Kerby, 1991, p. 67). Kerby argues that 'I', and the cogito it is implied by, is an important pronoun for the generation of the self. In any speaking instance, the use of 'I' designates the speaking subject. In dialogue, the other subject also uses this pronoun, and through its use it is provided with a certain spatial location. The 'I' of the other subject speaks from a physical body, and thus the body becomes the site of narration as well as the site of ascription for subjectivity - it becomes "endowed with the status of selfhood" (p. 71). According to Kerby, there is no transcendental ego behind the scenes, there is only a form of activity through which the self appears, namely language usage and expression. Of particular importance in this activity is the employment of personal pronouns, and self-referential narrative structures. Others also argue that self-narratives are particularly important for the construction of a sense of self (e.g. Bruner, 1995; Malm, 1993; van Langenhove & Harré, 1993). According to Miller (1994), personal stories, even when related informally, are a hard-worked active force which are particularly consequential for self-construction.

In conversation, the personal pronoun 'I' has a role, and constructs an individual sense of self, yet it also performs an act of commitment to the content of the utterance (Harré, 1989). This content can be extremely relevant to the construction of a sense of self. Engaging in conversation using language which concerns psychological phenomena, such as feelings, emotions, motives, attitudes and beliefs, is particularly salient for a person's sense of self. In the present time and place, psychological phenomena such as these constitute the self, and it may be recalled that there are arguments supporting the notion that these phenomena are discursively constructed in our speaking lives (Harré, 1993; Ryle, 1949). Language concerning aspects of self will be more central in constructing the user's sense of self than other, non-self

15

focused language. In a similar manner, stating other, less psychological, yet still personal information (e.g. demographic information) in language is also more central to a sense of self than other kinds of impersonal information.

Stating personal information in speech or writing also has a variety of functions. From the social constructionist standpoint, there is no truly 'private' information, for everything is shaped by language and its use, and language is a highly social phenomenon. Nevertheless, in stating or displaying personal information in conversation, there is an apparent 'shift' of the information from the private to the public realm. For the speaker, such a public act commits them to a certain position and enables them to justify and act on it (Totman, 1985; Gerhards, 1989), as well as assimilate and give meaning to it (Pennebaker & Beall, 1986; Totman, 1988). For example, expressions of emotions, such as anger or shame, enable the individual to reconstruct backgrounds, causes, motives and justifications through language (Gerhards, 1989). This process constructs the emotion into the individual's constantly emerging sense of self.

Language Context

The force of any utterance on a particular occasion depends not only on the content of what is said, but on the "nature of the occasion, the surrounding conversational environment, the local cultural conventions, the social roles occupied by the speakers and their intentions and beliefs" (Mühlhäusler & Harré, 1990, p. 23). In a very similar manner, the self construction processes that occur for an individual will depend on the context in which they engage in conversation. Yet it is a misrepresentation to state that self construction processes *occur for* the individual. Rather, individuals actively work to negotiate their own sense of self. Collier and Thomas (1988) assert that people negotiate multiple identities in discourse everywhere, and therefore personhood varies contextually.

Luckmann (1983) has provided an excellent description of the importance of the

setting for individual identity. He proposes that identity evolves almost exclusively in face-to-face social relationships, and has contrasted identity in primitive versus modern societies. In a primitive society, relationships are stable, familiar, individualized and connected, and continuously corroborate the individual's assumption they live in the same 'reality' as others. Modern societies, however, are divided into specialized domains with their own norms and values (or "language games"). Personal identity is no longer stable and cannot be consistently reaffirmed. Similarly, but on a more specific level, our sense of self is continuously reaffirmed and constructed as we use language in our everyday lives. Stable, familiar situations continuously corroborate this sense of self, while unfamiliar situations have different norms and values and it may be difficult to reaffirm the accomplished sense of self.

Similar ideas can be seen in the writings of Bakhtin, and his concepts of "social languages" and "speech genres". Bakhtin focused on the importance of the utterance, or the speech itself rather than the language system. Yet he was concerned with the different social languages that were used by various groups of people in the same culture using the same national language. Such social languages have been described as a type of discourse that is peculiar to a certain stratum of society (e.g. age group, professional) in a given social system (Holquist & Emerson, 1981, cited in Wertsch, 1991). According to Bakhtin, it is inevitable for a speaker to invoke a social language during any utterance or language use. This is a reflexive process, for the social language also shapes what the speaker is able to say (Wertsch, 1991).

Bakhtin (1986) also distinguished another form of speech type, namely speech genres. Speech genres correspond to typical situations and typical circumstances of speech communication. Each sphere of communication develops its own stable type of speech, and each relatively stable type of speech is a genre. In keeping with his emphasis on the utterance, Bakhtin described speech genres as "not a form of language, but a typical form of utterance" (p. 80). Therefore, speech genres include any stable and typical type of speech, such as greetings, farewells, military commands, narration, intimate conversation, dinnertime conversation and so on (Wertsch, 1991). Each speech genre has its own restrictions of style, content and structure, although

17

some are more flexible than others. For example, oral anecdotes allow more flexibility than military commands (Bakhtin, 1986). Bakhtin highlights the richness of our repertoire of oral and written speech genres, and the competence we have in employing them: "We learn to cast our speech in generic forms, and when hearing other's speech, we guess its genre from the very first words; we predict a certain length (that is, the approximate length of the speech whole) and a certain compositional structure; we foresee the end; that is, from the very beginning we have a sense of the speech whole, which is only later differentiated during the speech process." (p. 79).

Bakhtin argues further that any use of language, or any utterance, inevitably invokes a speech genre. It is easy to imagine a situation in which a person has an excellent command of language yet feels helpless because they lack the appropriate speech genre for that particular situation. However, once again, any specific speech genre is not merely a way of speaking, it is also a way of viewing and experiencing the world, and shapes what it is possible to say. Thus in employing any particular speech genre we take on a particular formulation of human experience (Sampson, 1993).

The concepts of social languages and speech genres are very useful for understanding some of the processes that occur when individuals negotiate their sense of self through conversation. In any situation where individuals share the same social language and understand the speech genres that are employed, the context in which the language is used will be extremely familiar and consistent. This provides the individual with a stable sense of rules, social practices and meanings, and language use gives the individual endorsement and affirmation of their ongoing and coherent sense of self. As the context is so familiar, the individual knows the shared language, and this language formulates a shared way of viewing human experience and self that the participants invoke. It is not necessary for language use to occur in a positive context, for there are many situations in which certain 'negative' speech genres are appropriate for participants. For example, consistent negative interaction with a significant other (e.g. partner, sibling, parent) provides a shared context, in and through which participants obtain endorsements of their actions and their perceptions of themselves.

18

Yet there are specific situations and contexts when negotiation of a sense of self is not forthcoming, nor may be achievable. When the social languages and/or speech genres employed in a situation are unfamiliar to a participant, active and competent negotiation of a sense of self is extremely difficult. The shared meaning of the language and situation may not merely be absent, it may be altered so that participants trying to negotiate meaning are talking past one another. In situations such as these (e.g. through a change in circumstance, such as death of a spouse or change of culture), the individual's coherent (and usually expected) endorsement of their sense of self is no longer forthcoming. Rather, active re-construction of this sense of self may take place as the individual attempts to integrate the inconsistency of the novel and unfamiliar context with their familiar sense of self.

Speakers' Differences

Any utterance cannot exist on its own. Outside the speaking subject, the utterance cannot exist, for it belongs to someone in a particular situation (Bakhtin, 1986). It always belongs to a speaking subject; a speaking personality; a point of view. Bakhtin termed this point of view 'voice', and saw this as a process rather than a location. He stressed the idea that voices exist in social context and cannot exist in isolation (Wertsch, 1991). The present work focuses on the speaker, and how any utterance belonging to that speaker will be negotiating a sense of self for that speaker. Thus, the 'voice' of the speaker is an active process, constructing the speaker's self. Naturally, different speakers will have different senses of self, and different ways and histories of negotiating these. In this respect it seems possible to have 'individual differences' regarding self-construction processes which are based in relationships, language usage and conversational experience.

People who have stable histories of accomplishing a coherent, continuous and ongoing sense of self are likely to expect and receive endorsement and affirmation of this. They are also likely to seek out situations and contexts that will provide them with such endorsement. On the other hand, there are also people who have histories of continuously renegotiating and reconstructing their sense of self in conversation and

daily life. The situations in which they find themselves may be unexpected, or unfamiliar, and not part of any speech genre or social language they are used to or familiar with. These differences in speaking histories affect any particular utterance by the speaker. They not only affect the form and nature of an utterance, but also what the speaker expects and how they act in a conversation, and in fact whether they can take part in the conversation at all.

Harré (1989) discusses these differences between speakers in terms of the skills and competencies that speakers acquire. He emphasizes the skills necessary for the correct performances in speaking life, and contrasts this with the more traditional hidden states attributed to individuals. Correct performances may mean successful interaction or simply further negotiation of one's sense of self. People actively manoeuvre themselves into settings and relational contexts in which they will manage to negotiate their sense of self and receive confirmation of this (McDermott & Church, 1976). Manoeuvring oneself into such situations can be viewed as a worthwhile social skill. Gumperz and Cook-Gumperz (1982) argue that further skills are required by speakers to discover the grounds for negotiation that take place in any conversational encounter, for it is these grounds that enable negotiation of meaning in a conversation.

Before any conversation (or self-construction) is able to occur, there must be at least minimal similarities between the participants in terms of their shared cultural and linguistic conventions. These conventions are not chosen by an individual but are limited to an individual, depending on the culture in which they live and belong, the positions they occupy in the social realm, and as Shotter (1993b) describes it, their relation to the extensive social "seascape". A person's relation to this more general social seascape is what makes them unique. However, within this seascape, people are unable to position themselves as they please, and due to various factors, some people have an easier passage to certain regions than others (Shotter, 1993b).

Certain differences also emerge between people using Bakhtin's notions of speech genres and social languages. Some people are competent with talking or writing in certain speech genres, while others are competent with other types of genres. In a

20

similar manner, people employ different social languages, and therefore differ in the way in which they understand themselves and their worlds. This does not only relate to different social groups, but even more strongly to members of different cultures. The language that is used and the language games that people engage in help to shape their understandings of the world and their selves. These understandings are derived and emerge in and through language use. Collier and Thomas (1988) define communication competence as behaviours, or social actions, that are perceived as appropriate and effective in specific contexts. They go on to also define interpersonal competence as the ability to "negotiate mutual meanings, rules and positive outcomes" (p. 108).

Shotter (1993b) emphasizes both the importance of the context for the speaking subject, as well as the subject's social history. In order to be able to take part in any conversation, the speaker must feel able to speak without struggling to have their voice heard. The right to speak stems from the 'belongingness' of the speaker in the situation. Part of this sense of belonging, according to Shotter, is that one "has an automatic right of initial access to the community simply by virtue of having contributed, in developing oneself, to the development of *its* ways of making sense" (p. 9). Context and an individual's 'place' not only affect the right to speak, but also the meaning of any utterance. In using a word, it becomes in-formed with the speaker's viewpoint in relation to the shifting conditions surrounding its utterance (Shotter, 1993b).

In summary, emphasizing the social location of self does not deny certain ascriptions to individual people. However, these ascriptions are much more relational, contextual and historical than they are individualized, consistent and trait-like. A person becomes a unique person not just because of the place they occupy in existence, but also how the occupation came about (Shotter, 1993b). Therefore, it is possible to speak in 'individual difference' terms regarding the construction of a sense of self, but for the differences to be based in relationships, language usage and conversational experience.

This chapter has provided a way of viewing language use in self-construction terms. All language use is said to construct a sense of self for the individual using the language. It is proposed that this active, constructive and important aspect of language use has physiological correlates in the cardiovascular system. There is evidence for such a conceptual scheme, and this will be outlined in the following chapter.

Chapter 2

Physiological Correlates of Self Construction Processes:
Cardiovascular Reactivity During Language Use

I gotta use words when I talk to you   (Eliot, 1932)

[Self-identity is] constituted and reconstituted relationally, its boundaries repeatedly remapped and renegotiated   (Scott, 1987)

The past two decades have seen investigators examining the impact of language use and social interaction on physiology. In a recent review, Tardy (1993) identified three "biologically important physiological responses" to language use that have been found (p. 340). Language use, most notably speaking, has been found to influence the cardiovascular system through increasing heart rate and blood pressure (Lynch, 1985), blood chemistry through an increase in plasma norepinephrine (Dimsdale, Young, Moore & Strauss, 1987), and also immune system functioning through depressing mitogenic lymphocyte reactivity (Knapp et al., 1992). The focus of the present work is on the physiological changes that occur in the cardiovascular system during language use, so only this type of physiological process will be discussed.

There has been much research documenting the presence and magnitude of these effects, and further work documenting factors that influence the magnitude of this effect. However, there has been relatively little theoretical speculation as to why the cardiovascular system is so responsive to communication, interaction, and language use, and little theoretical integration of the factors that influence this response. My central proposal is that many of these findings can be understood as physiological correlates of the self construction processes occurring during language use and social life. This conceptual scheme allows theoretical integration of a number of diverse cardiovascular reactivity findings.

Evidence for such a proposal comes not only from research findings looking at changes in cardiovascular functioning during language use, but also from more general

23

findings regarding resting blood pressure and cardiovascular disease (these will be discussed in Chapter 3). However, the present chapter focuses on findings regarding the specific processes of cardiovascular reactions to specific episodes of language use. The aim of the chapter is to review the major findings on cardiovascular activation during speech and communication, and to interpret them based on the notion that any language use has self-constructive properties for its user. However, before embarking on a description of these findings and their proposed theoretical integration, I will define some of the terms used in the cardiovascular reactivity area.

The Cardiovascular System and Cardiovascular Reactivity

The cardiovascular system is incredibly complex, consisting of the heart and all the body's veins, venules, arteries, arterioles, body tissues and capillaries. The basic function of the cardiovascular system is to provide oxygen and nutrients to sustain the living tissues within the body (Turner, 1994). It interacts with the respiratory system, such that blood is sent from the heart to the lungs to obtain oxygen, and then goes back to the heart and on to the rest of the body to provide the tissues with this oxygen. Once the oxygen has been removed, the blood returns to the heart and the process begins again. The heart contains four chambers: the right atrium, the right ventricle, the left atrium and the left ventricle, and is a muscle that regularly contracts and relaxes. This sequence, in combination with the opening and closing of the valves connecting the chambers, moves the blood through the heart and body. The cardiac cycle, or heartbeat, is made up of these systole (contraction) and diastole (relaxation) phases. A normal heart beats (contracts and relaxes) approximately 70 times per minute.

Blood pressure is a measure of the force liquid blood exerts against the walls of blood vessels throughout the body during the cardiac cycle. Each heartbeat pumps 50-75 mls. (2-3 oz.) of blood under pressure to the aorta, which subdivides to smaller arteries and then to arterioles, which also have the capacity to dilate and constrict.

When the arterioles constrict, the pressure in the arteries increases. Blood pressure is determined by the volume of blood pumped from the heart during each heartbeat (the stroke volume) and by the resistance the blood encounters in its passage throughout the peripheral circulation.

Cardiovascular reactivity is a physiological construct which is applicable to psychophysiological phenomena. It refers to specific change in cardiovascular functioning in response to a stimulus. Manuck, Kasprowicz and Muldoon (1990) have precisely defined reactivity as referring "to a portion of the variability among individuals that is seen on measurement of a physiologic parameter during subjects' exposure to a common behavioural or psychological stimulus (e.g. a psychomotor, cognitive or interpersonal challenge) which cannot be predicted from a knowledge of the variability that exists in that same parameter and among the same individuals in the absence of notable behavioral stimulation (e.g. at rest)" (p. 17). This definition highlights three important features of cardiovascular reactivity, namely that reactivity occurs in response to a stimulus, that individuals differ in their reactivity to such a stimulus, and that they do so in a way which is not predictable from their resting states. Although cardiovascular reactivity refers in principle to any type of stimulus, my main concern is with psychological stimuli.

Almost all of the research into cardiovascular reactivity includes measures of changes in systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), and to a lesser extent, mean arterial blood pressure (MAP). Systolic blood pressure is a measure of the maximum pressure of the blood in the arteries; this occurs when the heart contracts and blood is forced through the cardiovascular system. Conversely, DBP is a measure of the minimum pressure of the blood; this occurs between heart contractions, when the heart relaxes. Mean arterial pressure is the area under the pulse wave divided by the cardiac cycle duration (Pickering & Blank, 1989). It can be geometrically presented as a value corresponding to a horizontal line through a pressure wave tracing such that the systolic area above the line is equal to the diastolic below it (Cumes-Rayner & Price, 1988), or mathematically estimated as DBP + 1/3

(SBP - DBP) (Turner, 1994). Mean arterial pressure is thus not simply the mean of diastolic and systolic BP, rather it takes account of both HR and BP. Changes in MAP have been shown to be a good indicator of BP variability and of increased sympathetic activity (Mancia et al., 1983; Pagani et al, 1986; both cited in Cumes-Rayner & Price, 1988).

Cardiovascular Reactivity during Language Use

A number of studies have demonstrated significant changes in SBP, DBP, MAP and HR during speech. Within 30 seconds following the initiation of speech, these cardiovascular measures increase by 10-50% and fall back to pre-speaking levels as soon as a person stops speaking (Lynch, Lynch & Friedmann, 1992; Tardy, Thompson & Allen, 1989; Silverberg & Rosenfeld, 1980). This physiological pattern occurs during the mere act of talking, regardless of the context and the content of the talk. For example, BP and HR have been found to be reactive while children recite the alphabet (Lynch, 1985) or poetry (Friedmann, Katcher, Thomas, Lynch & Messent, 1983), when people are talking alone or in the presence of others (Lynch et al., 1980) and, when newborns cry (Hall, Thomas, Friedmann, Sappington & Lynch, 1982). Further, Silverberg and Rosenfeld (1980) have demonstrated that quiet, casual conversation can lead to an increase in BP and cardiac output which is equivalent to that evoked by moderate exercise.

These increases in BP and HR during vocalization and talk are evident in hypertensives and normotensives (Lynch, Long, Thomas, Malinow & Katcher, 1981), as well as men and women of all socioeconomic groups (Lynch, Thomas, Paskewitz, Malinow & Long, 1982). They have also been documented in various situations, including classrooms, workplaces and homes (Long, Lynch, Machiran, Thomas, & Malinow, 1982; Thomas et al., 1984). In 1982 Friedmann, Thomas, Kulick-Ciuffo, Lynch and Suginohara reviewed work carried out on this topic which showed that more than 90% of over 500 subjects, ranging in age from 3 to 75 years, showed an

increase in SBP, DBP and MAP while talking compared to a preceding rest period. Blood pressure returned to resting levels within one minute after the cessation of talk. According to Lynch (1985), the only group to date that has failed to demonstrate these typical BP increases during speech has been schizophrenics, both medicated and non-medicated.

Although BP and HR increase significantly when people read aloud (Lynch et al., 1980; Friedmann et al., 1982), reading silently is not associated with such an increase, suggesting the physiological pattern is not primarily due to cognitive processes (Friedmann et al., 1982). This has been further demonstrated in a study by Stein and Boutcher (1993), which showed that cardiovascular reactivity during an easy verbal task was not significantly different from cardiovascular reactivity during much more difficult, non-verbal cognitive tasks. Thus, verbalization of response, rather than cognitive difficulty, contributed significantly to cardiovascular reactivity during a task. Brown, Szabo and Sereganian (1988) have also reported that simple vocalization of numbers produced significant changes in HR, although more change was found when mental arithmetic was included in the task. Differences in cardiovascular reactivity during talking and listening have also been compared. Liehr (1992) found that while BP and HR significantly increased when people were talking about a nonstressful topic (their usual daily activities), there was minimal change in these cardiovascular measures when they were listening to someone else talk. Collectively, these findings suggest that the cardiovascular reactivity observed during language use cannot be solely interpreted in terms of cognitive processes, and that verbalization *per se* elicits a response in the cardiovascular system.

It could be suggested that much of the change in cardiovascular activity during speech can be accounted for by the movement of vocal muscles, of the face and by other body motions. However, the evidence suggests that these physical activities produce only a minimal amount of change in cardiovascular functioning, less than that observed during talk. This is highlighted in the surprising finding that the same cardiovascular responses observed during speech occur in deaf individuals when they

27

communicate in sign language (Malinow, Lynch, Foreman, Friedmann, & Thomas, 1986). In a well-designed study, Linden (1987) investigated various factors likely to affect autonomic activation during speech and concluded that "the motor efforts required for speech production are of minor importance in predicting autonomic arousal" (p. 562). Further, while antihypertensive medications lower resting baseline pressures, they do not block the rise in BP seen while speaking (Lynch et al., 1981).

Some research does reveal that certain features of human speech have an influence on cardiovascular reactivity. For example, Friedman et al. (1982) found that BP shows greater increases as the speed of talk increases, although Siegman, Dembroski and Crump (1992) failed to replicate this finding. On the other hand, their study did show that as the speed and the loudness of talk jointly and separately decrease, so does BP and HR during both a reading task and a structured interview.

These results, demonstrating an increase in cardiovascular activation during language use, have been obtained by researchers in a clinic or a laboratory, and have been criticized due to the limited generalisability of these settings and the theatrical nature of participants' speech (Henderson, Bakal & Dunn, 1990). However, ambulatory studies (in which participants carry a BP monitor providing regular cardiovascular measurements during normal activities) show that in daily life engaging in talk is also associated with an increase in cardiovascular activity (Van Egeren & Sparrow, 1990; Pickering, 1989). Further, Henderson et al. (1990) examined cardiovascular reactivity during speech among air traffic controllers while they were at work. Blood pressure measurement was achieved via RPI (the EKG R-wave to peripheral (ear) pulse interval, or the time taken for the pulse wave to travel to the ear) which avoids demand characteristic problems associated with inflating BP cuffs. The results showed that BP reactivity was related to speaking, although this increase was of a lesser magnitude than found by some experimental studies. Heart rate did not increase significantly with speech but was more responsive to situational demand. Therefore, it seems that both inside and outside the laboratory, language use is associated with cardiovascular reactivity.

Self-Construction Processes

The experimental and correlational evidence shows that the mere nonstressful act of talking has an important influence on the cardiovascular system, both inside and outside the laboratory. Furthermore, talking elicits greater cardiovascular reactivity in the laboratory than other activities. Researchers have found that engaging participants in speaking tasks elicits greater cardiovascular reactivity than any other type of task, including those involving mental arithmetic, video games, reaction time, and mirror drawings (Dimsdale, Stern & Dillon, 1988; Ewart & Kolodner, 1991; Light, Turner, Hinderliter & Sherwood, 1993; Niaura, Wilson & Westrick, 1988). Previously, studies investigating the relationship between communication and BP viewed the cardiovascular changes as a response to emotional stress, a perspective that is embedded within the Cartesian-Darwinian-Cannon framework of the physiology of arousal (Lynch et al., 1992). Research has investigated these more traditional interpretations of the reactivity during talking and shown that cardiovascular reactivity during talking is not simply a response to stress, nor due to cognitive processes. The cardiovascular system has been shown to display greater reactivity during speech tasks than during cognitive tasks (Dimsdale et al., 1988; Light et al., 1993). Further, Linden (1987) demonstrated that counting subvocally does not elicit cardiovascular reactivity, whereas counting aloud does, although this was not due to the motor efforts required for speech production. Further, studies have used self-report measures to examine possible reasons for differences in people's cardiovascular reactivity during language use. The results show that these differences are not due to anxiety (Gerin, Pieper, Levy & Pickering, 1992), nor to feelings of stress (Linden, 1987; Lepore, Allen & Evans, 1993).

Lynch et al. (1992) have recently proposed that the cardiovascular changes observed during speech may not be merely physiological responses to emotional arousal, but an integral part of human communication. This conceptualization can be elaborated using the notion that self-construction processes occur during language use. Many of the factors influencing reactivity during speech are difficult to understand, and make sense

of, when they are considered jointly. Applying the view that language use constructs a sense of self for the individual (as outlined in Chapter 1) to the cardiovascular reactivity area enables integration of many of the cardiovascular reactivity findings into a coherent conceptual scheme. Thus, it is able to make more sense of the findings than has previously been achieved.

Talking automatically requires an individual to use language, and thus enables self-construction processes to operate. Talking is also associated with activity in the cardiovascular system. It is proposed that this activity is the physiological correlate of self-construction processes occurring, and the cardiovascular system is most reactive when the language used by an individual is central to their sense of self. On this view, the cardiovascular system is inextricably linked to an individual's use of language because the language is actively constructing and maintaining a sense of self for that person. Further, the cardiovascular system is proposed to be more reactive when this process could be occurring but is thwarted or hindered in some way. Support for this contention comes not only from the research findings showing that the cardiovascular system is reactive during talking and communication, but also from the research findings regarding factors that influence the extent of cardiovascular reactivity during language use.

Factors that Influence Cardiovascular Reactivity during Language Use

Cardiovascular reactivity research has identified many psychosocial factors that influence the *extent* to which the cardiovascular system is reactive during language use. Although some of these factors can be viewed in the traditional 'response to emotional stress' terms, most of them cannot. The factors are numerous and diverse, and there has been little theoretical integration of them to help our understandings. As Slater, Good and Dimsdale (1992) have noted, "currently our empirical findings (data) significantly outdistance our ability to interpret them in a coherent conceptual scheme" (p. 193).

Before attempting to integrate any of these findings according to the present conceptual proposal, I shall briefly review some of the main factors that have been found to affect the extent of reactivity during language use under four headings: those that are primarily to do with the content of the language used; those regarding the context in which the language occurs; those that can be viewed as transient individual factors; and finally, those that are stable individual factors.

Language Content

Many of the earlier studies looking at BP reactivity during verbal interaction found that BP was highest when people talked about personal conflicts in their lives (see Näring, de Mey & Schaap, 1988, for a review). For example, in two case studies Kaplan, Gottschalk, Magliocco, Rohovit and Ross (1961) found that BP correlated with amount of hostile talk, while Adler et al. (1977, cited in Näring et al., 1988) compared the content of the interview before maximum and minimum BP levels, and found a relationship between content and BP for three out of nine categories. They summarized the content of these three categories as "active control over yourself and your environment", and reported that a lack of control was related to higher BP levels. Further, Williams, Kimball and Williard (1972) observed that DBP was significantly higher when their participants talked about relationships with significant others and areas of current life stress than when the content was more trivial.

More recently, Linden (1987) compared cardiovascular reactivity during four speech conditions: talking aloud with an experimenter about personally relevant topics, counting aloud with the experimenter present, counting aloud alone, and counting subvocally alone. While counting subvocally alone did not result in any cardiovascular activation, engaging in conversation with an experimenter about personally relevant topics elicited dramatically larger responses than any condition on nearly all of the seven autonomic indices measured. Further, these responses were not due to the perceived stressfulness of the task, with participants rating the conversations as low in stress. Linden concluded that speech content has a significant impact on

31

cardiovascular reactivity during speech. This was clearly observed during clinical interviews reported by Lynch et al. (1992). These authors observed sudden drops in BP when individuals talked about personal situations of extreme hopelessness.

The act of self-disclosing also affects cardiovascular functioning during talking. Cardiovascular reactivity has been found to be of a similar magnitude during the Structured Interview (a measure of Type A behaviour) and a non-social self-disclosure monologue (Pfiffner, Nil & Bättig, 1987). Further, Cumes-Rayner and Price (1988) found that a self-disclosure task in which participants responded to semi-personal questions elicited greater BP reactivity in hypertensives than did physical exercise, although this was not the case for normotensives. Christensen and Smith (1993) looked at the effects of self-disclosure in participants who were high or low in hostility. These researchers found that compared to a non-disclosure task (where participants talked about a hypothetical event they had previously read about), talking about a personally experienced stressful, negative event was associated with greater BP reactivity, but only among hostile individuals.

In an interesting series of studies, researchers have examined cardiovascular reactivity while spouses and partners communicate. Ewart, Burnett and Taylor (1983) examined cardiovascular response in two male hypertensives during discussions of marital problems with their wives, and found that BP increases were positively associated with disruptive comments and responses. In another study looking at communication between spouses, Ewart, Taylor, Kraemer and Agras (1991) investigated BP reactivity during a discussion of a threatening disagreement. In females, SBP changes were associated with the affective content of their talk, and both SBP and DBP reactivity were related to hostile exchanges. However, BP reactivity was not related to the content of males' talk.

Overall, the evidence clearly demonstrates that the content of an individual's talk influences the magnitude of their cardiovascular reactivity during that talk. Content that is focused on the self, whether it is regarding semi-personal information, feelings,

hostile exchanges or relating personal experiences, seems to consistently produce higher cardiovascular reactivity than content that is not directly focused on the self.

Context

Contextual factors have also been found to influence the magnitude of cardiovascular reactivity during language use. For example, in a series of early studies, Reiser, Weiner and Singer examined the cardiovascular responses of various people to laboratory interviews and task transactions. They concluded that the cardiovascular responses were related to the interaction of the participant and researcher, rather than the content of the communication or the stressful stimulus (Weiner, Singer & Reiser, 1962; Reiser, Thaler & Weiner, 1955). Williams et al. (1972) extended these ideas and investigated whether previously found changes in DBP during an interview were due to the novelty of the situation, the personal nature of the content of the interview, the direction of the subject's attention, or the amount and nature of the interpersonal interaction occurring during the interview. Their results demonstrated that DBP level was higher when participants talked about personal content with an interviewer who responded verbally and interacted warmly, than when the interviewer did not respond, or when the content was more trivial. This suggests that the content of the conversation was less important in determining the DBP response than interpersonal interaction. These researchers concluded that transactional 'involvement' with other people may be associated with BP reactivity, and proposed that the content may play a role in either facilitating or hindering such involvement.

Others have since looked at different 'interviewer' effects. Long and colleagues (1982) demonstrated that SBP, DBP, HR and MAP were significantly higher while participants were speaking to a high status interviewer compared to an equal status interviewer. Kleinke and Williams (1994) have replicated this effect in SBP and HR during an interview about interests, hobbies and life goals. They also investigated the effects of the interviewer's gender and touch on cardiovascular reactivity during the interview, however neither gender nor touch had any effect.

33

Another contextual factor that has been found to influence reactivity during speech is the presence of a supportive 'other'. This has been studied as an operationalization of "emotional" social support (Gerin et al., 1992). In their study with female participants, Kamarck, Manuck and Jennings (1990) found that being accompanied by a friend attenuated HR and SBP reactivity during laboratory tasks (cognitive tasks requiring verbal responses), as well as DBP during a structured Type A interview when the friend was actually sitting outside the interview room. There were no differences between participants accompanied by a friend and those performing the tasks alone in their performance or emotional arousal, suggesting the presence of a friend did not have a distracting effect or alter the perception of stress. In a more realistic social situation, Gerin et al. (1992) examined the cardiovascular reactivity of females during an argument between the participant and two female confederates, while a third female confederate supported or did not support the participant. Supported participants showed much smaller SBP, DBP and HR reactivity during the situation than non-supported participants. Again, there were no significant differences between those supported and not supported in terms of anxiety, perceived stress, anger or enjoyment, nor were there differences in the amount they talked. Both studies concluded that social support does not function by simply reducing anxiety, but has a more direct effect on autonomic activity.

Lepore (1995) has also provided some evidence for the effect of situational social support on cardiovascular reactivity during talking. Males and females who were supported by a confederate exhibited smaller BP and HR reactivity than those who were not supported (alone) during the preparation and delivery of a speech. However, there was little effect of support on cardiovascular reactivity among people high in cynicism, whereas those low in cynicism showed lower reactivity when supported. Contrary to previous findings, perceived stress did appear to mediate the effect, although perceived arousal did not.

Somewhat surprisingly, researchers have also demonstrated that the presence of an animal has an effect on cardiovascular reactivity during talking and verbalization.

Friedmann and colleagues (1983) investigated cardiovascular responses while children were reading, and found lower BP reactivity when there was a dog present than when the dog was not present. The researchers speculated that the presence of a pet influences the perception of the experimenter and the situation, making it less threatening and more friendly. Similar findings were obtained in a study by Friedmann, Locker and Lockwood (1993) with adults reading a non-affect laden text, although cardiovascular reactivity was lower among individuals who perceive animals more positively than those who perceive them more negatively. Further, Vormbrock and Grossberg (1988) found that BP levels were lower when participants were talking to a dog than when talking to an experimenter, and general feelings towards dogs did not alter this effect. However, Grossberg, Alf and Vormbrock (1988) failed to find any differences in cardiovascular reactivity among males with and without their own dogs present while they told stories and computed arithmetic.

Thus, various contextual factors have been identified as influencing the extent of cardiovascular reactivity during talking. These range from factors concerning the interviewer through to the presence of other people, or situational social support, and animals. In self-construction terms, they can be viewed as features of the situation that provide familiar, or not so familiar, patterns of communicating, and thus affect the process of endorsing or challenging the negotiation of a sense of self.

Transient Individual Factors

Another set of factors shown to affect the relationship between talking and cardiovascular reactivity are those that can be conceptualized as residing within the individual, yet are specific to the situation in which the talking occurs. In this sense they can be viewed as transient. Emotions are a good example, as they are generally defined as 'states' and experienced by the individual over a short time frame.

Previously (as noted earlier), many researchers investigating the relationship between communication and BP interpreted all cardiovascular changes as a response to

emotional stress. In one of the earliest documentations of cardiovascular reactivity during an interview, Alexander (1939) concluded there was a clear correlation between emotional disturbances and BP changes. He specifically mentioned the emotions of hostility, depression and anxiety. Other researchers have also emphasized these emotions as relating to cardiovascular reactivity during language use. For example, Kaplan et al. (1961) reported an association between amount of hostility and BP change in two hypertensives, while van der Valk (1957) found that fear and anxiety related to increases in DBP, and hostility and anger related to increases in SBP during interviews.

More recently, Tardy, Allen, Thompson and Leary (1991) examined state anxiety during talking. They demonstrated a relationship between state anxiety and SBP reactivity while participants talked about topics that were rated as medium on an intimacy scale. Heart rate was also associated with state anxiety, but only among those participants who were high in trait anxiety. Cumes-Rayner and Price (1990) used state anxiety to aid in the interpretation of their results from two studies. One study compared the reactivity of hypertensives and normotensives, and found that hypertensives displayed greater reactivity during minimal self-disclosure involving peer observation. These authors suggested that hypertensives react indiscriminantly with generalized anxiety to novel stimuli. In their second study, Cumes-Rayner and Price showed that whether or not people perceive there is social approval while they are talking about themselves influences BP reactivity. The perception of social approval moderated the effect of self-disclosure on BP reactivity in borderline hypertensives. Those individuals with a low perception of social approval displayed greater reactivity during self-disclosure than did individuals with a high perception of approval. Again, these findings were interpreted in anxiety terms. Therefore, while there has been little direct investigation of the relationship between state anxiety and cardiovascular reactivity during language use, this has been used as an explanatory concept.

A series of studies by Smith and colleagues have shown that another, quite different

transient individual factor influences cardiovascular reactivity during talking, namely the extent to which efforts are made to influence another person. This research was undertaken after asocial laboratory tasks, such as mathematical calculations, elicited greater reactivity when participants were actively attempting to influence the outcome of the task. The results of these studies were integrated with the concept of "active versus passive coping" (Obrist, 1981). Active coping can be defined as effortful attempts undertaken to secure a reward or avoid punishment (Smith & Christensen, 1992).

Employing this concept in an interpersonal domain, Smith, Allred, Morrison and Carlson (1989) had male participants engage in a discussion in which they tried to influence the opinions of their partners to improve their own chances of winning money. Half the men were informed that their chances of winning money increased according to how much attitude change took place in their discussion partner, whereas the other men's chances of winning money were not contingent on anything; they were simply told they would have the chance of winning money whatever the outcome. The results clearly demonstrated that those participants with an incentive to influence another had significantly higher SBP, DBP and HR reactivity than those without any such incentive. This 'contingent' influence attempt elicited additional BP increases of 10mmHg above the average 15mmHg increase elicited by other common features of the task between the two conditions. In their second study, these researchers replicated this BP effect with male and female participants, and also showed that a larger incentive to be persuasive was associated with higher SBP and DBP reactivity. Heart rate reactivity was also related to persuasive attempts, but only among male participants.

Two further studies provide evidence for this effect of interpersonal influence on cardiovascular reactivity during talking. Smith, Baldwin and Christensen (1990) asked participants to read a statement while listeners rated them on the extent they thought they were telling the truth, on a scale of 1 to 10. Those participants who were informed they would receive money contingent on where the listener rated them had

greater SBP, DBP and HR reactivity than those whose receipt of money was not contingent on anything. Further, there were three types of contingent conditions, easy, difficult and hard, based on where the listener rated the speakers. Cardiovascular reactivity was highest in the difficult condition than the other two contingent conditions, a finding that is consistent with traditional active coping results. More recently, Brown and Smith (1992) have examined the effects of effortful attempts to influence one's spouse on cardiovascular reactivity. Their results showed that in couples trying to influence one another to improve their chances of winning money, husbands displayed greater SBP reactivity than husbands who were simply discussing the same topic without any attempts to influence their partner. There were no differences in cardiovascular reactivity between wives attempting and not attempting to influence their spouses.

These 'interpersonal influence' findings have generally been interpreted in terms of active or effortful coping. However, Manuck, Morrison, Bellack and Polefrone (1985) have pointed out that active coping tasks produce high levels of engagement or involvement, and have suggested that it may be this more general dimension that is associated with increased cardiovascular reactivity. Nevertheless, it appears that certain transient individual factors, including anxiety and attempts to influence others during talking, can have an effect on cardiovascular reactivity during language use.

Stable Individual Factors

The final set of factors that have been identified as influencing cardiovascular reactivity during language use are stable individual factors. These are stable in the sense that they do not change across the speech or talking situation itself, nor are they part of this situation. They can be viewed as features that individuals bring to a laboratory or a talking situation, and that generally differ across individuals. Some of these features may be viewed as traits, others are demographic factors, while still others may be perceived as learned, such as competencies, skills, and so on. In this sense they can be viewed as personal 'resources' that individuals bring into a situation.

This term moves away from the meanings derived from more traditional personality terms, highlighting that these features do not necessarily reside 'within' the individual, and placing more emphasis on their social nature. Individual resources are brought to a situation with the individual, and tend to interact with other, more transient features of talking episodes.

Hostility is one such factor that has been investigated in the present context. While individuals who are high in hostility do not differ from those low in hostility in their cardiovascular reactivity to traditional, non-speech laboratory tasks, a difference does emerge in social situations where language is used (see Smith & Christensen, 1992, or Smith, 1992, for a review). For example, Hardy and Smith (1988) demonstrated that during a role-playing task involving interpersonal conflict, males who were high in hostility displayed greater DBP reactivity than those low in hostility. There were no differences in low conflict interactions, however. Similar findings were obtained by Suarez and Williams (1989), who showed that hostility was associated with greater cardiovascular reactivity during a word-identification task, but only when harassment was involved. Smith and Allred (1989) also found hostility to be related to BP reactivity during a debate with another participant among males. Christensen and Smith (1993) found that people high in hostility had greater BP reactivity during a self-disclosure task than those low in hostility, although these groups did not differ in the nature of their self-disclosure. Further, there were no differences in cardiovascular reactivity between individuals with high and low hostility during speech that did not require any self-disclosure. Thus, it appears hostility does relate to cardiovascular reactivity during talking in males, but only when the talk was self-focused.

Other stable individual factors found to influence reactivity include trait anxiety and dominance. Tardy et al. (1991) have demonstrated a relationship between trait anxiety, state anxiety and cardiovascular reactivity during talk about medium intimacy topics. Significant correlations were observed between state anxiety and HR during talking, but only among people high in trait anxiety. However, SBP was related to state anxiety for all participants regardless of trait anxiety. In another study, the effect

of dominance in individuals was examined in relation to cardiovascular reactivity during a debate (Rejeski, Gagne, Parker & Koritnik, 1989). Ten dominant and ten submissive males took part in a debate, during which they were given false physiological feedback concerning biochemical substances in their body. They were informed (incorrectly) that these substances covaried with their dominance of the situation, and all participants received feedback showing low dominance. Unexpectedly, these researchers found that submissive individuals had higher HR reactivity than the dominant ones, while there were no main effects of dominance on BP.

Private self-consciousness, which is the tendency for an individual to direct attention inward to aspects of the self such as moods, feelings and thoughts, has also been shown to influence BP reactivity during language use. Niaura et al. (1988) involved participants in four different laboratory tasks, one of which required them to talk in front of a video camera about themselves (this task elicited the highest cardiovascular reactivity). Contrary to expectations, these researchers found that participants with low private self-consciousness had higher SBP reactivity across the tasks than those high in self-consciousness, and this effect was even stronger among Type A individuals. During the speech, Type A participants who were low in private self-consciousness showed the largest SBP reactivity, however consumption of alcohol completely attenuated this effect. Further, consumption of alcohol at the time did not decrease perceived anxiety. Niaura et al. suggest that for individuals low in private self-consciousness, forced self-awareness may be aversive given that the natural tendency is to avoid the self-aware state.

A further factor that can be considered as something the individual brings into a situation is their normal level of social support. Tardy et al. (1989) examined the effects of this stable 'resource' on cardiovascular reactivity during talking, and found that social support significantly influenced SBP, DBP and MAP reactivity while individuals talked about moderately intimate topics. Individuals who were less satisfied with the support provided by their social contacts had higher reactivity than

those who were more satisfied.

Another individual factor that is perhaps more traditionally viewed as 'stable' is sex. Some laboratory studies have not found women and men to differ significantly in cardiovascular reactivity during speech tasks (e.g. Girdler, Turner, Sherwood & Light, 1990), although others have found differences. Fredrikson, Tuomisto, Lundberg and Melin (1990) observed greater DBP reactivity averaged across a cognitive task and a semistructured Type A interview in men, although no other differences in reactivity emerged. Further, during an active speech task, Light et al. (1993) observed higher HR reactivity in women than men, and greater SBP reactivity in White men than in White or Black women or Black men.

In discussions with spouses or partners, Ewart et al. (1991) also observed male-female differences in cardiovascular reactivity. In women, BP reactivity was related to the affective content and quality of the speech, whereas in men it was related to hostile exchanges, problem solving and speech rate. Lassner, Matthews and Stoney (1994) also observed differences in cardiovascular reactivity between women and men during family discussions, where only women exhibited elevated HR and SBP. However, Brown and Smith (1992) found that during discussions between spouses, men who had an incentive to influence their spouse showed greater SBP reactivity than men not trying to influence, whereas no differences were observed among the women in these different conditions. This is consistent with other interpersonal influence results, where men with a larger incentive to influence display greater BP reactivity, and women show no change in BP reactivity (Smith et al., 1989). Hostility is another factor that has been found to influence cardiovascular reactivity during talking in men, but not in women (Smith, 1992).

A further individual factor documented as influencing cardiovascular reactivity during speech is the Type A/B distinction. Type A individuals are characterised by a tendency towards competitiveness, achievement striving, aggressiveness and hostility, impatience, restlessness and explosiveness of speech, and sense of time pressure

41

(Jenkins, 1971). Type As have been shown to refer to themselves twice as often as Type Bs during the Structured Type A Interview, and this related to higher levels of BP during the interview (Scherwitz, Berton & Leventhal, 1978). A similar finding was obtained by Niaura et al. (1988), who found that self-referencing correlated with SBP reactivity among Type As during a speech task.

Therefore, a number of stable individual factors that are brought into a situation with the individual have been shown to affect cardiovascular reactivity during talking. These include traits such as hostility, anxiety, and submissiveness; personality variables such as private self-consciousness and Type A; and other factors such as general level of social support and sex of the participant. These individual 'resources' have been found to interact with one another, and to also interact with other factors involved in the talking situation, including the content of the talk, influence attempts and consumption of alcohol.

This review of factors found to influence the extent of cardiovascular reactivity during language use is not comprehensive, yet illustrates the diversity of such factors. It also shows how complex the results become as different factors are included in studies and the joint effects of variables on cardiovascular reactivity are examined. It seems that if any understanding is to be gained in this area, it is necessary to study multiple variables and their combined effects on cardiovascular reactivity during language use. However, this creates problems in choosing which variables are important to include together in any study, and how effects are interpreted when they are found. Unfortunately, there is currently little theory available to interpret such joint effects, or to guide their combination in the first place. Further, there has been little theoretical integration of the findings, and as the field becomes increasingly complex, it becomes more difficult for such integration to occur.

Evidence for Self-Construction Processes

Engagement-Involvement

The notion of engagement-involvement has been employed to conceptualize and integrate some of the cardiovascular reactivity findings. Singer used this concept in 1974 to summarise a number of findings on cardiovascular responses during human research focusing on interviews and transactions, as well as results from animal research. She differentiated 'involvement' from relating, interacting or affect states, and described it as referring to "phenomena falling among the domain of behaviours which include arousal, alerting, and engagement" (p. 5). The studies she reviewed suggested that the recency, extent and degree of engagement-involvement with the surroundings or with one's inner self was associated with important changes in both the cardiovascular and endocrine systems. Singer concluded that individuals with more immediate and active patterns of involvement when they encounter situations would show greater cardiovascular reactivity than those who are typically less engaged, or who are more passive in regard to their environment.

Manuck and colleagues (1985) have drawn on and extended this engagement-involvement notion in their conceptualization of the determinants of idiosyncratic cardiovascular responses. According to these authors, an individual's cardiovascular response to any particular situation depends on both their *response potential* (based on parental history of hypertension) and their degree of engagement-involvement. Manuck et al. note that engagement-involvement is a characteristic of the individual's immediate experience (Singer, 1974), however suggest situational and dispositional factors may determine the degree of engagement-involvement. Among the situational variables discussed are demands for 'active coping' (Obrist, 1981), which by their nature encourage engagement and involvement, task related incentives, and the novelty/familiarity of the stimulus. One behavioural factor discussed is the Type A/B behaviour pattern, where Type A individuals can be seen as characteristically approaching a task in a more active, effortful and engaged manner than Type Bs.

Therefore, engagement-involvement may be influenced by many factors in an individual, and these may be reflected in their cardiovascular reactivity to a task.

Others have also drawn on the concept of engagement-involvement as a way of integrating findings regarding factors found to influence the magnitude of cardiovascular reactivity during speech. Following a review of some of these factors in 1988, Näring et al. concluded that the key concept was engagement-involvement, and distinguished two main types: involvement with content and interpersonal involvement. It was noted that these types are not independent of one another, as content may facilitate or hinder transaction occurring.

Some of the factors influencing cardiovascular reactivity during language use outlined in this chapter can be conceptualized in engagement-involvement terms. In terms of content, talking about topics regarding the self, relationships with others, feelings that the person is experiencing or has experienced, are associated with greater cardiovascular reactivity than less self-focused topics. These can be viewed as more 'self' involving for a person than less self oriented topics. Some contextual factors can also be viewed in these terms, as Williams et al. (1972) have pointed out. Based on the results of their research, these authors concluded that transactional involvement with other people is the key concept relevant to BP reactivity. Transient individual factors, such as experienced emotion and trying to influence another person, may also elicit higher involvement in individuals with their inner self, or their surroundings, respectively. Finally, some stable individual factors can also be viewed as influencing the degree of engagement-involvement in a situation, as Manuck et al. (1985) have shown with Type A behaviour.

However, some of the factors found to influence cardiovascular reactivity during talk are not consistent with this engagement-involvement conceptualization. Take, for example, the findings on situational social support. Being accompanied by a friend may facilitate transactional involvement more than being alone, as may the presence of others, while the presence of a non-supportive other may actually hinder such

transactional involvement. Yet cardiovascular reactivity is higher with a non-supportive other than with a friend, or alone. Other contextual factors are also problematic within this conceptualization. For example, we may expect that engaging in conversation with an interviewer of equal status would facilitate more involvement than with an interviewer of higher status, yet the cardiovascular system is more reactive to an interviewer of higher status. Findings regarding state anxiety are also difficult to interpret in terms of engagement-involvement. Individuals who experience high anxiety have higher cardiovascular reactivity than others. It is difficult to imagine high anxiety being related to the 'engagement' or 'involvement' of the individual in their surroundings, although this state could be argued as involving the individual more with their inner self.

This distinction between engagement-involvement with one's surroundings (i.e. transactional involvement) and with one's inner self (Singer's terms) is irrelevant if we think in self-construction terms, where both are important for self-construction processes. Being involved with one's self, especially during language use, is an important aspect of self-construction, as is being involved with one's surroundings, for self only appears in relation to others. From this perspective, engagement-involvement could be viewed as one factor that enables self-construction processes to take place.

Self-Construction

I suggest that one way of theoretically integrating the factors that influence cardiovascular reactivity during talking is by employing a self-construction framework. When will self-construction processes be most likely to occur? Firstly, self-construction is proposed to take place during language use. We have already established that the cardiovascular system is reactive during language use. However, the extent to which self-construction occurs during language, whether it be endorsing one's sense of self or actively reconstructing it, depends on other factors. Certain features of the language used, the setting in which the language use takes place, and the characteristics of the individual may all influence processes of self-construction.

These factors can be viewed as paralleling the factors that influence cardiovascular reactivity during language use. How central the language is to one's sense of self is proposed to be related to the extent of cardiovascular reactivity during language use. Further, difficulties in endorsing one's sense of self through language (due to various factors, including those related to content, context and the individual) is also proposed to be related to greater cardiovascular reactivity during language use than not having difficulties with this process. Attempting to negotiate one's sense of self but failing to do so challenges that sense of self, and this is reflected in changes in the cardiovascular system. This interpretation of self-construction processes, language use and cardiovascular reactivity is consistent with the empirical evidence regarding reactivity during episodes of language use. This can be seen with a reconceptualization of the cardiovascular reactivity findings in terms of the proposed theoretical scheme, focusing on the content of the language, the context in which it is used, and the individual who is using the language.

Language Content

Language content that concerns the self is more central to construction processes involving a sense of self than other content. This is paralleled in the cardiovascular reactivity findings. Research has demonstrated that the extent to which a person uses personal pronouns when talking (such as 'I', 'me', 'mine') relates to cardiovascular reactivity, such that the more self-references used, the higher the reactivity (Lovallo & Pishkin, 1980; Pfiffner et al., 1987). Scherwitz and Canick (1988) have suggested that self-referencing can serve to consolidate an individual's identity, or maintain that identity in the face of a challenge to the identity structure. In a similar manner it may serve to create and maintain their sense of self, as many narrative theorists argue (e.g. Kerby, 1991).

Further, as reviewed above, an individual's BP and HR are more reactive when they are discussing content that is central to the self, such as personal feelings and emotions, than content that is not explicitly focused on the self. Laboratory tasks that

require some form of self-disclosure elicit higher cardiovascular reactivity than other tasks. However, this also depends on individual factors. While self-construction processes operate during language use regarding the self, there may be certain individual factors that hinder these processes from occurring. This would be related to greater cardiovascular reactivity, as the situation would not provide endorsement of a sense of self. This is consistent with the empirical findings. Individuals high in hostility display greater reactivity during disclosure than those low in hostility (Christensen & Smith, 1993). Hostile individuals are defined as having negative attitudes and appraisals regarding others, and more generally they are said to hold a belief that others are unworthy and unable to be trusted (Smith, 1992). As self-construction usually occurs in interaction with others, such a view may hinder the endorsement of a sense of self in certain situations, such as those that involve disclosing personal information. Other situations and conversation topics may be much more familiar for hostile individuals, and these would provide the endorsement and negotiation. Further, individuals who do not perceive high social approval during self-disclosure also display greater reactivity. A similar interpretation can be placed on these findings. Individuals who do not perceive social approval may have difficulty in negotiating a sense of self during language use that is so central.

Language Context

Certain features of the setting in which the language is used also influence processes of self-construction. Firstly, language used in the presence of another person or people will be more central to self-construction processes than language used by oneself, as self-construction occurs in relation to others. The cardiovascular reactivity findings are consistent with this notion. Talking in the presence of another person elicits higher cardiovascular reactivity than talking in the presence of animal, or talking alone (Allen, Blaskovich, Tomaka & Kelsey, 1991). Similarly, talking *to* another person elicits higher reactivity than talking *to* an animal (Vormbrock & Grossberg, 1988).

The familiarity of any particular situation will influence self-construction processes, for in familiar situations the individual automatically has the right to speak, and the social language and speech genres are well-known and easily employed. Anything not familiar will make the negotiation of one's sense of self difficult, whereas familiarity will enable endorsement and maintenance of that sense of self, as argued in Chapter 1. Language use in familiar situations provides endorsement of an individual's sense of self. However, in more novel situations, the regular endorsement of one's sense of self is not forthcoming and more active self-construction processes are attempting to take place during the language use. What sorts of things make a situation familiar? The place where the language is used can be more or less familiar for an individual, and the people who are present can also strongly influence the familiarity of a situation.

Cardiovascular reactivity findings, as well as ambulatory BP findings, are consistent with these 'familiarity' features. Cardiovascular reactivity during language use, as well as during daily living, is lower in situations that are more familiar for individuals than those that are not so familiar. For example, Spitzer, Llabre, Ironson, Gellman and Schneiderman (1992) found that across various daily activities SBP and DBP varied significantly with social situation, such that they were lowest when with family, higher when with friends, and highest when with strangers. Resting BP levels have also been shown to be lower at home than at the physician's clinic or in the laboratory (reviewed in Van Egeren & Gellman, 1992).

Further, the presence of certain 'others' can make a situation more familiar. Having a friend present certainly makes a situation more familiar, and cardiovascular reactivity during talking is lower when an individual is in the presence of a friend than when alone (Kamarck et al., 1990). In most cases, the presence of a supportive other will also be more familiar for an individual, and the very nature of being supportive provides some endorsement of an individual's sense of self. A non-supportive other does not provide such endorsement, but rather challenges the maintenance of this sense of self. Individuals' cardiovascular reactivity has been shown to be lower

during language use in the presence of a supportive other than when they are alone or in the presence of a non-supportive other (Gerin et al., 1992; Lepore et al., 1993). Some studies have also obtained similar results during laboratory tasks that do not involve language use (Gerin, Milner, Chawla & Pickering, 1995), although Sheffield and Carroll (1994) found little difference in cardiovascular reactivity between support and non-support conditions in their study. However, these authors suggested that social support may reduce cardiovascular reactivity to stress but only in realistic situations.

During an interview the status of the interviewer can also make the situation more familiar. Taking part in a discussion with a person of equal status would be more familiar for individuals, and provide more endorsement of their sense of self, than taking part in a discussion with a person of higher status. In Bakhtin's terms, people of equal status would be more likely to share the same social language. As already noted, cardiovascular reactivity is lower when the individual is with an interviewer of equal status, than with an interviewer of higher status. Engaging in a conversation with an interviewer of higher status would elicit greater difficulty in self-construction processes due to unshared speech genres, languages and understandings.

The response style of an interviewer is also central to construction processes, which are proposed to occur particularly during interaction with others. If there is no interaction occurring at all, the situation is not so crucial for self-construction. However, appropriate interaction with an interviewer who responds warmly will provide a context for negotiation of one's sense of self. This is consistent with cardiovascular reactivity findings. Williams et al. (1972) found that warm interaction with an interviewer during a discussion elicits higher reactivity than when there is no interaction during the discussion.

The situation itself can be more or less important for an individual's sense of self. Branscombe and Wann (1992) carried out an interesting study on physiological responses of viewers watching a boxing match on film (American versus Russian

competitors). They investigated whether being highly identified with one the athletes (the American) influenced physiological reactions before and after the match. Participants who reported frequently feeling proud to be an American were classified as being high in American identity, whereas those who reported a low frequency of experiencing pride in their American identity were classified as low in American identity. The results clearly demonstrated that those who were highly identified with the American athlete showed significant increases in both SBP and DBP pre- to post-match, while those who did not identify with the athlete showed no such cardiovascular change. This suggests that the situation itself can be more important for one's sense of self depending on the self that is brought into the situation.

Certain emotions may also be viewed as influencing self-construction processes during language use. Emotions that are generally viewed as negative, such as hostility, anxiety or fear, may thwart any negotiation or endorsement of one's sense of self during talk. This hindrance would be related to greater cardiovascular reactivity during any language use. This has been demonstrated in early studies where fear and anxiety and hostility were associated with greater BP increases during talking (van der Valk, 1957; Kaplan et al., 1961).

Speakers' Differences

Language content and context factors can all be viewed as influencing the extent of processes of self-construction, and as paralleling those factors that influence an individual's magnitude of cardiovascular reactivity to many situations. However, cardiovascular reactivity is defined as an individual difference in physiological response, and the evidence shows that some people are consistently more reactive to particular situations than others (Sherwood & Turner, 1992). How might this be understood in the present self-construction conceptualization? It may be that individuals who differ in their cardiovascular reactivity also differ in their processes of self-construction during any talking episode due to past experience and personality differences. These factors will be brought into a situation with the individual and

may, in combination with more transient factors, influence the extent of self-construction that occurs.

Take an individual's general level of social support as an example. People with high social support have probably had more opportunity to engage in conversations with supportive others than those with low social support. Further, these people would also have had more opportunities to talk about themselves in a familiar context. Both these features, engaging in conversation with supportive others, and talking about oneself in a comfortable setting, influence self-construction processes. These features would enable individuals with high levels of social support to receive more endorsement of their sense of self than others. Therefore, individuals high in social support have a history of receiving regular endorsement of their sense of self. On entering and taking part in a social situation, all individuals are undergoing some negotiation of their sense of self, however this would be more difficult and unfamiliar for individuals low in social support compared to those who have engaged in such negotiations regularly.

The cardiovascular reactivity findings support this notion. During language use, individuals who have high levels of social support have lower cardiovascular reactivity than those with lower levels of social support (Tardy et al., 1989). Further, social support has been related to ambulatory SBP. Linden, Chambers, Maurice and Lenz (1993) found that women with high social support had lower SBP than those with less social support. This effect was independent of daily stress and biological risk factors, although was not observed among men.

Often a situation can become more or less familiar for an individual depending on aspects of their personality, or stable resources, that they bring to a situation. Recently cardiovascular reactivity findings have demonstrated that reactivity is greater in individuals who experience a situation or must behave in a way that is inconsistent with their normal, and preferred, way of behaving. For example, Niaura et al. (1988) found that individuals who tend not to focus much on their thoughts, feelings and emotions displayed greater SBP reactivity when they had to talk about themselves than

people who did tend to focus on these things about themselves. Looking at preferred mode of anger expression, Engebretson, Matthews and Scheier (1989) found that among participants who were harassed in their study, those who responded in a non-preferred way had greater SBP and HR reactivity. Similar findings have been observed with hostility, and a recent review concluded that hostility affects cardiovascular reactivity, but only when the hostile person is in a relevant social situation (Smith & Christensen, 1992). This is also highlighted in an ambulatory study by Ewart and Kolodner (1994), examining trait anger in boys and girls at high school. Their results showed that anger predicted BP between classes, when interactions with peers occurs. In Blacks, anger related to SBP during this time, while in boys it related to DBP, although no effect was found in girls.

In summary, this chapter has focused on cardiovascular reactivity findings among normotensives and healthy individuals while they are engaged in language use. By applying the perspective that language use is part of the process of constructing a sense of self, diverse cardiovascular reactivity findings have been able to be integrated and made better sense of. There is currently much evidence to support the position that cardiovascular reactivity may, over time, lead to hypertension and other cardiovascular diseases. A lot of evidence relates psychological factors to cardiovascular reactivity, and cardiovascular reactivity to disease. There are many psychological factors shown to relate to cardiovascular disease, yet again these are diverse, and there has been relatively little theoretical speculation regarding them. Many of the findings in this more 'disease' oriented context can also be made sense of using the present perspective on language and self-construction processes. It is to the research in this area that we now turn.

Chapter 3
The Reactivity Hypothesis, Resting Blood Pressure Levels and Cardiovascular Disease

Identity is organismic: it is at once biological, psychological and social
(Scherwitz & Canick, 1988)

The foregoing discussion regarding self-construction processes, language use and BP and HR activity has been focused on the minute-by-minute functioning of the cardiovascular system. Over a long period of time this functioning may have implications for resting BP levels, and the development of hypertension and other cardiovascular diseases. Such a proposition is known as the 'reactivity hypothesis', and it is supported by some empirical evidence. However, researchers disagree about the conclusions that can be drawn from this work (e.g. Rosenman, 1992; Manuck et al., 1990).

The cardiovascular system is reactive during language use, and language use is a pervasive part of people's lives. While researchers have argued that stressors used in the laboratory to elicit cardiovascular reactivity are not relevant to stressors that occur in natural environments, such an argument cannot be made regarding cardiovascular reactivity during talk and interaction with others. If cardiovascular reactivity during daily life does influence resting BP and the risk of cardiovascular disease over time (as the reactivity hypothesis suggests), then cardiovascular reactivity during language use would seem to be an important factor in this process due to its pervasive nature. Further, if self-construction processes can be used to explain variability in cardiovascular reactivity during language use, then they should also be able to be applied to findings regarding resting BP, hypertension and other cardiovascular diseases. This chapter will demonstrate that the current self-construction framework is able to conceptually integrate many of the diverse empirical findings regarding resting BP levels, hypertension and cardiovascular disease. Firstly, however, the reactivity hypothesis will be explained further, and the nature of hypertension and

53

other cardiovascular disease described.

Cardiovascular Disease and Hypertension

Cardiovascular disease is the most common cause of mortality in industrialized nations (Gold & Franks, 1990). This term refers to any disorder of the heart and blood vessels, many of which have differing causes, symptoms and prognoses. The most prevalent cardiovascular disease is arteriosclerotic heart disease (also known as ischemic heart disease, or coronary heart disease) (Jenkins, 1988; Davidson, 1994). Levels of both SBP and DBP have a positive, linear association with risk of coronary heart disease and also total cardiovascular morbidity and mortality. Sustained high BP, or hypertension (defined by the World Health Organization as resting SBP greater than or equal to 160mmHg, and/or a resting DBP greater than or equal to 95mmHg (Rose, 1985)) is a major risk factor for at least four major cardiovascular diseases, including cerebrovascular disease and coronary heart disease (Johnson, Gentry & Julius, 1992). Hypertensives are three times more likely to develop cardiovascular disease as normotensives (Kannel, 1976) and are two to four times more likely to develop coronary heart disease (Jenkins, 1988).

Hypertension is a serious problem in nearly all countries of the world. In New Zealand, 29% of men and 24% of women over the age of 45 are hypertensive (Nye, Paulin & Russell, 1992). Similar statistics are reported for the United States and Canada (Davidson, 1994). Hypertension is symptomless and if not identified will declare itself through permanent tissue and organ damage. Furthermore, hypertension is the commonest reason to begin lifetime medication (Rose, 1985). Despite the seriousness of hypertension, little is known regarding its aetiology. Known physical risk factors account for only 10% of the variance in the development of essential hypertension. This highlights the importance of further research aimed at identifying potential causal factors involved in essential hypertension and high BP. It is currently believed essential hypertension is a multifactorial disorder, and while many variables have been proposed (e.g. salt intake, genetics, stress) to be involved in its etiology, no

single factor appears to apply to all hypertensive individuals (Krantz & Manuck, 1984).

The Reactivity Hypothesis

The reactivity hypothesis suggests that heightened cardiovascular responses to behavioural stressors play some role in the development of hypertension and coronary heart disease. Evidence clearly shows that individuals vary appreciably in the magnitude of their cardiovascular reactivity to behavioural stimuli, and that these reactions are especially pronounced among borderline hypertensives and in normotensives with a family history of hypertension. Further, exaggerated cardiovascular reactions to behavioural stressors have been found to be linked to the incidence and prevalence of hypertension (Wolman, 1988).

Individuals' cardiovascular responses (primarily, HR and BP reactions) have been shown to exhibit temporal stability over a period of days to months (Manuck et al., 1990), and to be consistent over a variety of different stressors (Obrist et al., 1983; Turner, Sherwood & Light, 1990). Some individuals are consistently more reactive than others, and further, the hemodynamic mechanisms involved (which appear to differ according to the individual and the nature of the stressor) are relatively stable individual characteristics. Therefore, cardiovascular reactivity exhibits attributes that are consistent with it being viewed as a psychophysiological trait (Sherwood & Turner, 1992). However, evidence that behaviourally-evoked reactions in the laboratory generalize to daily life activities is scant and inconsistent (Pickering & Gerin, 1992). After a review of the literature in this area, Manuck et al. (1990) concluded that this may be due to methodologic deficiencies, an absence of clearly articulated hypotheses and a confusion of objectives among investigators.

Findings to date support the notion that behaviourally-evoked cardiovascular reactivity plays some role in essential hypertension. The hypothesis that repeated cardiovascular

responses to psychological stressors *lead* to hypertension, however, has sparked a vast amount of interest and controversy over a number of decades, with investigators disagreeing as to the plausibility of such an association. The prospective epidemiological evidence shows that a number of studies have not found associations between (mainly) cold pressor reactivity and subsequent hypertension, although most of these studies suffered from large methodological weaknesses (Manuck et al., 1990). However, two longitudinal studies with follow-up periods of more than 20 years do show significant prospective associations between cold-pressor reactivity and hypertension (Wood, Sheps, Elveback & Schirger, 1984, cited in Manuck et al., 1990; Menkes et al., 1989). Further, Borghi, Costa, Boschi, Mussi and Ambrosioni (1986, cited in Anderson, McNeilly & Myers, 1992) found that both intralymphocytic sodium and diastolic reactivity to a mental arithmetic task predicted sustained hypertension among borderline hypertensives after five years.

Cardiovascular reactivity may be linked to the development of hypertension in several ways. Manuck et al. (1990) have distinguished four potential associations. Firstly, cardiovascular reactivity is a marker for risk rather than a direct cause of hypertension, and a third (unknown) variable causes both the reactivity and hypertension. The literature points tentatively to a possible sympathetic mediation of behaviourally-evoked cardiovascular reactivity. Secondly, cardiovascular reactivity moderates the effects of some other pathogenic factor, so that the unknown factor leads to hypertension only in the presence of heightened reactivity. For example, family history may lead to hypertension only among those individuals with high reactivity. There is no direct evidence for this hypothesis.

A third and more common hypothesis is that cardiovascular reactivity is a direct cause of hypertension. Some researchers suggest that the elevated BP and cardiac output of highly reactive individuals under stress leads, over time, to an increased peripheral resistance and hypertension. Obrist (1981) has provided a working model of this hypothesis, drawing on the influential work of Folkow (1982). The elevated resistance may occur through structural changes in the arterioles (Katz, 1962, cited in Wolman,

1988; Folkow, Grimby & Thulesius, 1958, cited in Manuck et al., 1990), or via intrinsic homeostatic processes which act to prevent an overperfusion of body tissues (autoregulation) (Guyton & Coleman, cited in Manuck et al., 1990). According to Obrist (1981), this latter mechanism may be particularly important because in many behavioural situations, a markedly increased cardiac output will supply O_2 levels in excess of concurrent metabolic demands (Krantz & Manuck, 1984). Somewhat surprisingly, there is little animal experimental work in this area.

Finally, the diathesis-stress model states that people with high cardiovascular reactivity are vulnerable to hypertension only if they are exposed to prolonged and significant stress. Thus, there is an interaction between the biological predisposition of the individual and the demands of the social environment. Further, attributes of personality may play a role similar to stress in this model, eliciting cardiovascular reactivity in real life and thereby promoting hypertension. There has long been evidence showing that certain personality variables, most notably anger and hostility, are implicated in hypertension.

Overall, the large amount of data collected on cardiovascular reactivity to behavioural stressors, although indirect, is definitely suggestive of a link with elevated BP and cardiovascular disease. Further, as Cohen, Kaplan and Manuck (1994) have recently pointed out, taken together findings "suggest that recurrent episodes of acute cardiovascular and neuroendocrine reactivity evoked by behavioural stimuli may contribute to risk for coronary disease, and that such risk may be greatest among those individuals who exhibit the largest magnitude of psychophysiological response" (p. 207). Plausible working hypotheses have been proposed as to the mechanisms involved in this link, and the evidence justifies further work in this area.

Evidence for Construction Processes

As outlined in Chapter 2, the process of constructing a sense of self during language use is suggested to be associated with cardiovascular reactivity. Certain features of this process can be viewed as related to heightened cardiovascular reactivity during language use, most notably difficulties in receiving endorsement of one's sense of self. According to the reactivity hypothesis, heightened cardiovascular reactivity may, over time, lead to hypertension and cardiovascular disease. Language use is a pervasive part of our lives and people spend much of their time engaged in this activity. Therefore, continual interaction in situations that hinder endorsement of a sense of self may also lead to high BP, hypertension and other cardiovascular diseases via cardiovascular reactivity. There are various groups of empirical cardiovascular findings that can be conceptualized in this way.

Changes in Social Context

A large amount of literature highlights the association between high BP and settings in which the individual is unable to obtain regular endorsement of their sense of self. These are settings that are changed and new for the individual, where this usual endorsement is expected but no longer forthcoming, and which may actually hinder self-construction processes. Such change in social context may be due to physical relocation into a new society or culture, to changing environments in the communities in which people live, or to major life events or loss.

<u>Migration</u>

A large body of findings shows that migrants who live in a 'Western' society differing from their own exhibit higher BP levels than the inhabitants of both their old society and the new society (see James, 1987, for a review). For example, a large study carried out in Israel examining the incidence of hypertension among 10,000 men, many of whom were not born in Israel, demonstrated that incidence related to year of

immigration. The longest residents tended to have the highest rates of hypertension (Kahn, Medalie, Neufeld, Riss & Goldbourt, 1972). Further, Scotch (1963) examined the BPs of Zulus living in rural and more modern urban areas. He found that Zulus living in urban areas had significantly higher rates of hypertension than those living in relatively traditional communities.

Migrants are one group of people who clearly do not obtain regular endorsement of sense of self, entering a new culture with new social practices, meanings and 'language games'. Social rights and obligations vary by culture: in some cultures these rights are based on economic differences, while in others they are ascribed, based on kinship relations, age and sex (Dressler, 1994). For migrants, any interaction in a new culture would be unfamiliar in terms of social rights (and associated rules governing interactions), as well as speech genres, social languages and possibly national languages (e.g. English/Spanish). Therefore it would be very difficult for an individual to receive endorsement of their sense of self through these interactions. This may lead to continuous attempts at renegotiation of the self, attempts at constructing it to 'fit' with the new rules and language practices of the culture. These processes would be related to higher cardiovascular reactivity when using language in the new setting and according to the reactivity hypothesis, higher resting BP levels.

Findings from specific studies looking at migrants are consistent with this view. The importance of the *difference* in culture for high BP upon migration has been highlighted in a study by McGarvey and Baker (1979), which examined BP among Samoan migrants to Hawaii. These researchers found that only males emigrating from the traditional (as contrasted with Western) areas of Samoa had significant post-migration increases in BP. Further, among Zulus living in urban communities, Scotch (1963) found that those individuals who maintained traditional cultural practices and were unable to adapt to urban living were most likely to be hypertensive.

Other research demonstrates BP differences among people with differing levels of interaction and embeddedness in the new culture. A study by Beaglehole and

59

colleagues (1977) looked at adult Tokelauan migrants to New Zealand, and found that those adults who interacted *more* with New Zealand society had *higher* BP levels (controlling for age, body mass and length of residence in New Zealand). Further, Carvalho, Lima, Carvalho and de Souza (1985) compared the BP of two Yanomano Indian groups, one with notable contact with Brazilian society and one more isolated. While there were no significant differences in BP levels between these groups, a difference did exist between members of the contact group. Those who could speak Portuguese had significantly higher BP levels than those who only used the native language. Fleming-Moran and Coimbra (1990) interpreted these results as identifying a marker (language) which distinguished individual exposure to culture change. This is fully consistent with the current self-construction notion that unfamiliar language use in a new culture can lead to elevated BP over time.

As a new culture becomes more familiar and endorsement of a sense of self within this context is received, however, BPs would be expected to decrease. Such a curvilinear relationship was observed by Hanna and Baker (1979) among Hawaiian Samoans: those least integrated into modern life had the lowest BPs (possibly interacting more in their original culture and receiving endorsement there); Samoans who were in intermediate exposure to modern life had the highest BP levels; and those most integrated into the modern society had lower levels.

Modernization

Changes in individual social contexts may also occur because of changes that are occurring in the broader society in which people live. Many researchers have shown that BP increases are related to a rapidly changing social milieu (Weiner, 1979; Eyer, 1975; Henry & Cassell, 1969; James, 1987). Cross-cultural research demonstrates that mean BP levels increase as a society becomes more "industrialized" and "modernized" (Dressler, 1990), or as there is an increase in the social complexity of a population (Fleming-Moran & Coimbra, 1990). Waldron et al. (1982) examined epidemiological survey data on BP across 84 societies, and found a significant increase in mean

population BPs with type of society. As the society became more industrialized and the economy more developed, mean BP increased. These findings have led Dressler (1994) to conclude it is not simply societal complexity that leads to increases in BP and cardiovascular disease, but economic development or modernization.

James (1987) discusses two competing hypotheses for explaining the effects of modernization on high BP. The first focuses on the increased exposure to physical risk factors for hypertension in modern societies, such as salt intake and amount of physical exercise. The second hypothesis concerns the necessary intimate contact between the Western culture and the other more traditional culture, and the confrontation between the two value systems. He hypothesizes that the breakdown in ancient values and norms leads to chronic autonomic arousal, which over time elevates BP levels. Although the endpoints of disease are different, James' second hypothesis is consistent with a study of the incidence of coronary heart disease in an Italian-American community in Pennsylvania. Bruhn and Wolf (1979, cited in Dressler, 1994) reported that despite the fact that this community had high risk factors for heart disease, they had a very low incidence of heart disease in the 1970s compared to surrounding communities with more mixed ethnic diversity. The community was characterised by a strong ethnic identity, traditional values and social organization. As this social integration began to change in the 1970s, however, there was an increase in coronary heart disease rates, especially among younger people.

In industrialized societies, BP levels increase with age, yet it seems that this does not occur in other societies. According to Weiner (1979), "when a society is stable, and when its customs, traditions and institutions are well-established and well-structured and its members respond to a predictable sociocultural environment with integrated patterns of psychological adaptation, the BP levels do not become elevated with age" (p. 23). On the other hand, those who do live in a rapidly changing society which is unpredictable and unfamiliar do tend to develop increasing BP with age. Although this increase is not apparent in all individuals, Weiner (1979) suggests that it probably occurs only in the predisposed.

Luckmann (1983) contends that as societies become more specialized, identity can no longer be reaffirmed. In other words, endorsement of a sense of self during interaction with others is no longer forthcoming as the rules and language games of a society shift. This affects cardiovascular reactivity during interactions, which in turn may lead to higher BP levels and cardiovascular disease. Janes (1990) describes the most salient and empirically pertinent mediating structure in rapid sociocultural change as "...that consequent of the intersection of individual life situation with the cultural, economic, and political concerns of the collectivity: social performance, the creation and enactment of social roles, and hence the construction of social relations" (p. 218). This focus on social relations is crucial, for it is in this realm that individuals construct their sense of self.

Life Events

Settings in which the individual is unable to obtain regular endorsement of their sense of self due to major life events or loss have also been related to elevated BP levels. These settings are new for the individual, where the usual endorsement of self is expected but no longer forthcoming. The causes of these unfamiliar settings have been generally referred to in the literature as "environmental stress" (e.g. Surwit, Williams & Shapiro, 1982). This is a broad and inconsistently defined category in which authors classify a diverse number of findings. It may be more fruitful to reconceptualize these findings in terms of self-construction processes.

Disasters and traumatic events clearly lead to changes in usual situations and settings. Blood pressures have been found to be higher following major man-made disasters and traumatic events. For example, Graham (1945) demonstrated that soldiers with long combat experience had high BP that lasted four to eight weeks after combat. Over a quarter of these soldiers remained hypertensive for several months following their return. Significant elevations in BP were also observed in Texan residents after a ship loaded with explosive chemicals blew up a chemical plant (Ruskin, Beard & Schaffer, 1948, cited in Surwit et al., 1982). These pressures remained elevated for

62

10-14 days.

Other, less dramatic, major life events are also associated with BP levels and hypertension. For example, a prospective study of employment and job loss among married men showed that BP levels were higher during anticipation of job loss and unemployment than they were during stabilization in new jobs (Kasl & Cobb, 1970). Further, men who experienced more severe unemployment had BP levels that remained elevated for a longer period of time than other men. Some research has examined the relationship between life events in general and BP, and this work shows that among a normal population, BP is higher among those experiencing more life events than those experiencing fewer life events. Myers and Miles (1981) reported that among 76 low income Black adults, those with high BP had a greater proportion of negative to total life change events than those with normal BP. In another study investigating the BP of hypertensives, Buck and Donner (1984) found that those with more unfavourable and unexpected life events in the previous eight months were more likely to have BP that was "no longer under control" (over 90 mmHg for DBP). Thus, unexpected life events were related to BP control in previously controlled hypertensives. However, not all the research is consistent with these findings. Some studies have demonstrated an inverse relationship between life events and BP levels (Spicer, 1996), and hypertensives have been found to report fewer life events of all types than normotensives (Theorell, Svensson, Knox, Waller & Alvarez, 1986).

The death of a partner has a major impact on the life of the surviving partner, and is related to excessive mortality rates (Stroebe, Stroebe, Gergen & Gergen, 1982). The recently bereaved have higher rates of coronary heart disease, which is the main cause of death in this population. Such a loss has a pervasive impact and, according to Stroebe et al. (1982), should lead to "deficits in a number of areas which can be characterised as social validation, social support, task performance and social protection. The surviving partner should experience problems in validating a wide range of his or her judgements" (p. 548).

63

Settings and social contexts which are new for an individual due to life events or loss affect self-construction processes. The individual is no longer able to obtain the regular and usually forthcoming endorsement of their sense of self. The new situations may be characterised by different speech genres and social languages in which the individual is unable to take part, or may highlight a major shift in the way in which the world had been understood. Major loss can shatter the assumptions on which any individual's world is based (Wortman, Sheedy, Gluhoski & Kessler, 1992). Continual language use in situations that are unfamiliar and based on different assumptions and language games means that the maintenance of a person's sense of self will be thwarted and regular endorsement not received. This can be viewed as being linked to the cardiovascular system, and over time may influence resting BP levels, hypertension and cardiovascular disease. However, some individuals are able to go through the process of renegotiating their sense of self, and to develop "a new worldview that eventually allows them to continue a meaningful and rewarding life" (Wortman et al., 1992, p. 251). Thus, a new perspective may be developed in which a sense of self is renegotiated in the new social context.

Interestingly, writing about traumatic events has been found to reduce BP levels and be beneficial for health in general. A series of studies by Pennebaker and colleagues has revealed that experiencing a trauma but not confiding it to anyone was related to higher resting BP levels. In the short term, writing about the trauma was also related to higher BP, but in the longer term repeated writing about the trauma over a number of consecutive days was related to lower resting BP as well as better physical health in general (Pennebaker & Susman, 1988; Pennebaker & Beall, 1986). Thus, engaging in language use regarding the trauma may enable the individual to integrate the event and renegotiate their sense of self during this process.

Social Networks and Support

As suggested in Chapter 2, individuals who are integrated into a social network and feel a sense of belonging obtain regular endorsement of their sense of self in contrast

to those who are more socially isolated. People who have greater social networks are more likely to be in situations that are stable and familiar, with shared forms of language, than others. Engaging in language use would be comfortable as the social languages and speech genres would be part of the settings and situations, developed and ruled by the social networks themselves. During any episode of language use, people with larger social networks would have less hindrance to their processes of self-construction, and less cardiovascular reactivity during such use. More socially isolated individuals may have difficulty in their processes of self-construction during language use, and greater cardiovascular reactivity.

In a similar manner, people with greater social support are also more likely to be in familiar and comfortable situations, where the social language and speech genres are shared and readily used. Further, people with higher levels of social support are also likely to talk about personal information more often than those with less social support. This information is more central to self construction processes and in a familiar situation provides endorsement and unhindered negotiation of one's sense of self. This in turn is related to less cardiovascular reactivity during language use and over time, lower resting BP levels.

The evidence is supportive of this conceptualization. Research has consistently demonstrated that social networks and social support are inversely related to resting BP and hypertension (Strogatz & James, 1986; Dressler, Mata, Chavez, Viteri & Gallagher, 1986; Knox, 1993). Further, people with larger social networks and households have been found to have lower BP levels than others (Bland, Krogh, Winkelstein & Trevisan, 1991). Social isolation was one of the risk factors identified in a study examining BP in a rural and relatively disadvantaged population in New York state. Those who were more socially isolated had significantly higher BPs than those who were less socially isolated (Gold & Franks, 1990). Further, a very large study in Israel investigating cardiovascular disease among 10,000 males found that the best predictor of hypertension was the number of persons living together in the household (Kahn et al., 1972). Blood pressures were lower among those with more

people living in the household. Similarly, Dressler (1982) found that in St. Lucia, those individuals who had formed links with a number of households through producing offspring had lower BPs than others.

A number of large epidemiological studies have also found associations between social network and/or support and cardiovascular disease mortality and morbidity. These associations have been shown to be independent of traditional risk factors for cardiovascular disease. In one study of almost 4,000 Japanese-American men living in San Francisco, Joseph (1980, cited in Berkman, 1985) found that social affiliation was negatively associated with incidence (onset) of coronary heart disease, and this was independent of risk factors such as age, physical inactivity and family history of heart attack. Another large study also examined coronary heart disease in Japanese-American men. The Honolulu heart study included 4653 men and found that social integration predicted prevalence of coronary heart disease (including angina pectoris and myocardial infarction), such that as social integration increased, coronary heart disease decreased. Again, this relationship existed independently of standard biologic risk factors (Reed, McGee, Yano & Feinleib, 1983).

Similar findings have been obtained in studies outside the United States. In a meta-analytic review of seven studies investigating premature death from cardiovascular disease in middle aged Danish men, Olsen (1993) observed that social network was an important, independent risk factor for cardiovascular disease. Further, the impact of social network on cardiovascular mortality was demonstrated to be similar to that of traditional risk factors. A 12 year prospective study by Welin, Larsson, Svärdsudd, Tibblin and Tibblin (1992) showed that cardiovascular mortality was related to a low level of social activities both inside and outside the home; few persons in the household and poor perceived health. When other risk factors were controlled for in their analyses, social activity remained an independent predictor. These researchers found that as social activity decreased, there was a gradual increase in risk of cardiovascular disease mortality from 8.2% to 18.6%. A similar finding was observed among a group of 736 Swedish men who were followed for six years, and the

incidence of myocardial infarction and death from coronary heart disease examined. Both emotional support and social integration were lower in men who developed coronary artery disease (Orth-Gomer, Rosengren & Wilhelmsen, 1993). In New Zealand, fewer social contacts have been associated with greater risk of myocardial infarction in females (Spicer, Jackson & Scragg, 1993), as well as with coronary death (Spicer, Jackson & Scragg, in press).

Other studies show a relationship between social networks, social support and mortality in general (although not specifically cardiovascular mortality). In a well-cited study, Berkman and Syme (1979) investigated mortality among almost 7,000 adults over nine years in Alameda County, California. People with few social connections were found to be at increased risk of dying from many causes of death, including from cardiovascular disease, than those with more extensive social connections. Four types of social relationships were examined, all of which predicted mortality independently of the others: marriage, contacts with friends and family, church membership and group associations. Other studies have also revealed that those who are not married, whether they are single, divorced, separated or widowed, have higher mortality rates than those who are married (see Berkman, 1985, for a review). However, studies have shown overall that satisfaction with marital relationships or social activities is unrelated to mortality (Berkman & Syme, 1979; Antonucci & Johnson, 1994). In their review of the empirical evidence for the relationship between social networks and mortality, House, Landis and Umberson (1988) concluded that "prospective studies, which control for baseline health status, consistently show increased risk of death among persons with a low quantity, and sometimes low quality, of social relationships" (p. 540).

Few studies have compared the relative importance of different types of social support on cardiovascular disease. Measures of social networks typically include marital status, close family and friends, participation in group activities and church affiliations (Cohen, 1988), while other measures of social support emphasize functional, structural and emotional aspects of social relationships. In their study of coronary artery disease,

Seeman and Syme (1987) found that network instrumental support (aid from network) and emotional support (problem-solving help and feelings of being loved) were more important predictors of coronary atherosclerosis than was network size, independent of traditional risk factors. Hazuda (1994) reported a similar finding in a review of the United States epidemiological evidence for a link between social support and cardiovascular disease, namely that instrumental and emotional support appear to have a larger impact than the structure of that support.

Relationships at work have also been found to influence cardiovascular disease. In the Framingham heart study, women clerical workers who had a non-supportive supervisor were at increased risk of developing coronary heart disease over a period of eight years (Haynes & Feinleib, 1980). A more recent study showed similar results in a Swedish sample of both men and women (Johnson & Hall, 1988, cited in Cohen et al., 1994). In this study the amount of interaction occurring with coworkers was found to buffer work stress against coronary heart disease prevalence.

Studies have also investigated the survival of patients with cardiovascular disease, including myocardial infarction, angioplasty and coronary artery bypass surgery. Helgeson (1991) observed that the extent to which myocardial infarction patients disclosed to their spouse was related to recovery one year later after controlling for traditional coronary risk factors. Lack of disclosure predicted worse rates of rehospitalization and/or death, as well as chest pain and distress. Two recent reviews of some of the recovery literature concluded that overall, social networks predict survival independently from traditional indicators of disease extent (Antonucci & Johnson, 1994; Ell & Dunkel-Schetter, 1994).

In summary, the evidence supports a link between aspects of social networks and high BP, cardiovascular disease and cardiovascular mortality. In a recent review of the international epidemiological evidence for these relationships, Orth-Gomer (1994) concluded that the effects of social support and social network on cardiovascular disease are moderate, and that the types of social support relating to cardiovascular

risk factors have an emphasis on social anchorage and belongingness. This is consistent with the current contention that self-construction processes occur in social context, and that those who obtain regular endorsement of their sense of self are anchored and feel they belong in their social world. Other individuals who are more socially isolated have difficulty obtaining regular endorsement of their sense of self, and during specific episodes of language use may be hindered in this process. Over time, given the ubiquitous nature of language, this could lead to high BP, cardiovascular disease and cardiovascular death.

Individual Resources

An enormous amount of research has investigated individual differences between people with and without high BP and cardiovascular disease. This literature shows that certain personality traits and social behaviours have been consistently related to resting BP and heart disease. Reconceptualizing these factors as resources that an individual holds and brings into different situations enables their integration using self-construction ideas.

<u>Personality</u>

Resting BP levels are higher among people who have a tendency not to use language that contains content central to one's sense of self, such as emotions, feelings and beliefs. A review of this literature concludes that in general, hypertensives have problems regarding the identification and expression of aggressive feelings and use denial and repression to cope with negative affect (Sommers-Flanagan & Greenberg, 1989). Hypertensives conceal their personal thoughts and feelings more than others, and are generally less self-disclosing (Handkins & Munz, 1978) unless there is strong situational pressure to disclose (Cumes-Rayner & Price, 1989a). Cumes-Rayner and Price (1989b) suggest that hypertensives do not disclose as much personal information as normotensives due to their concern with social approval and acceptance, and draw on different findings to support this proposition.

When hypertensives and normotensives are compared in terms of their experienced life events, hypertensives have also been found to report fewer life events of all types than normotensives (Theorell et al., 1986). Further, among 18 year old men, hypotensives (low BP) have been found to report more positive life events than others, while hypertensives reported a less positive life situation (Svensson & Theorell, 1983). Theorell et al. (1986) suggested that hypertensives may experience the same number of life events, but report fewer of them, or they could experience fewer. Interviews in their study revealed that hypertensives had a smaller social network, less aggression and were more alexithymic than others.

Chronic negative emotions have also been consistently associated with high BP. Empirical studies and reviews of the literature demonstrate that hypertensives have been found to be more anxious, neurotic and depressed (McGrady & Higgins, 1990; Byrne, 1992); they are also more submissive and have more self-reported anger problems than normotensives (Manuck et al., 1985; Surwit et al., 1982). Further, introversion, lack of self-disclosure and inhibited power motivation, or the desire to have impact on others, have been found to differentiate hypertensives from normotensives (Drummond, 1982; Handkins & Munz, 1978; McClelland, 1979). Similar kinds of findings have emerged in studies of cardiovascular disease, where chronic troubling emotions have repeatedly been associated with the presence of one or more forms of coronary heart disease (Jenkins, 1988).

Social competence has been used as a broad psychosocial construct to integrate many findings on personality, high BP and cardiovascular disease (e.g. Ewart, 1994; Linden & Feuerstein, 1981; Manuck et al., 1985). It appears there is a considerable amount of overlap between the personality and behavioural characteristics of hypertensives and individuals who display deficits in social skills (Linden & Feuerstein, 1981). Hypertensives are generally viewed as less socially competent than normotensives (Morrison, Bellack & Manuck, 1985; Manuck et al., 1985), and in a review of the literature examining psychosocial variables and hypertension, Sommers-Flanagan and Greenberg (1989) concluded that the typical hypertensive "has relatively few, good,

70

solid, interpersonal relationships that are either intimate or confiding. In addition, it seems that the hypertensive individual feels more demand and less comfort in social situations than the normotensive..." (p. 21).

Ewart (1994) sees social competence constructs as providing a way to bridge the gap from genes and social learning to situational stress reactions, emotional expression, behavioural coping and eventual illness. From this social-contextual perspective, dispositions such as hostility can be viewed in terms of goals, expectancies, strategies and capabilities. He examines sources of non-shared experience between siblings that may account for differences in coronary prone behaviour and disease, and relates these experiences to social competence indices. In a similar sense, the traits and behaviours reviewed here can be seen as individual resources, all of which are an inherent part of the social nature of the individual, derived from past experiences and taken with the individual into new situations.

Individuals lacking in social competence would, by definition, find it difficult to take part in the language games and use the appropriate language genres applicable to the social situation. This deficit in social skills would make it difficult for the individual to negotiate and receive endorsement of their sense of self. According to the present proposition, these individuals would be expected to have more cardiovascular reactivity during language use. The research is consistent with this view, demonstrating that hypertensives have greater BP reactivity during language use and social involvement than normotensives (Stephens, Crowther, Koss & Bolen, 1988). This was first documented in the 1950s, with hypertensives showing greater responses than normotensives during stress interviews (Wolf and colleagues 1951, 1955, cited in Slater et al., 1992). These increases were not a function of the speed of talk, because hypertensives and normotensives differed even when talking with the same speed (Innes, Millar & Valentine, 1959, cited in Weiner, 1979). Further, the hypertensives' BP responses lasted longer following the cessation of talk. Since these early studies, hypertensives have demonstrated much greater increases in BP and HR than normotensives during many different talking situations, including a personal

71

discussion (McKegney & Williams, 1967), an intense, friendly discussion with an interviewer (Dimsdale et al., 1988), a self-disclosure task involving peer observation (Cumes-Rayner & Price, 1990) and role-playing (Morrison et al., 1985). Males with a family history of hypertension have also displayed greater SBP reactivity during an interpersonal task than males without such a history (Semenchuk & Larkin, 1993).

Type A and Hostility

The most extensively researched psychological individual difference variable in coronary heart disease is the Type A behaviour pattern. As outlined in Chapter 2, this is a behaviour style characterised by intense striving, high competitiveness, hostility, hastiness and continuous involvement in multiple activities. Kasl and Rapp (1991) emphasize that even though studies have tended to treat Type A as a stable personality variable, it is a behaviour pattern stimulated by appropriate environmental challenges. The first major Type A findings emerged from the Western Collaborative Group Study (Rosenman et al., 1975, cited in Oatley, 1992). This prospective study examined an initial sample of more than 3500 healthy men, and over eight years found that Type A men (defined on the basis of the Structured Interview) were twice as likely as Type B men to develop coronary heart disease. Jenkins (1988) has reviewed both supportive and nonsupportive results of studies examining the link between Type A and cardiovascular disease, and concludes that the overwhelming majority of findings have shown strong positive relationships. Further, a meta-analysis of 83 studies examining psychological predictors of heart diseases showed strongest associations with Type A and depression, and weaker but reliable associations with anger, hostility, aggression and anxiety (Booth-Kewley & Friedman, 1987).

Although the Type A behaviour pattern has provided intriguing empirical findings, there have been few attempts to elaborate these into a conceptually integrated theory (Radley, 1982). Matthews (1982) has critically evaluated the psychological nature of Type A risk factors and described different possible conceptualizations of this. Three of her conceptualizations share a concern with the ways in which Type A individuals

evaluate themselves. Wright (1988) has argued that the Type A behaviour pattern involves three components: time urgency; chronic activation (staying active for most of the day); and multiphasia (having more than one project underway and doing more than one thing at a time). Evaluating oneself constantly in many different situations (which may or may not be familiar) may make it difficult to receive regular endorsement of one's sense of self, particularly if there is always pressure for any interaction to cease due to a sense of time urgency. As mentioned in Chapter 2, Type A individuals do exhibit higher cardiovascular reactivity during language use (Hardy, 1989), although Carroll (1992) has queried the reliability of this association.

In recent years many researchers have argued that the pathogenic component of Type A is hostility, or potential for hostility, and that this feature alone is the best predictor of heart disease (Dembroski & Costa, 1987; Williams, 1984, cited in Wright, 1988). Further, major reviews of the literature have concluded that anger and hostility seem to play a role in the development of hypertension (Diamond, 1982), as well as other cardiovascular diseases (Gold & Johnson, 1990; Siegel, 1992; Smith, 1992; Ewart, 1994). A recent meta-analysis of four prospective studies concluded that hostility was a significant risk factor for cardiovascular disease (Matthews, 1988). Studies have also examined the relationship between anger and resting BP. The findings are somewhat inconsistent: studies have found anger *suppression* to be positively related to BP (Dimsdale et al., 1986) in women and men (Haynes, Feinleib & Kannel, 1980; Johnson, Schork & Spielberger, 1987); to be negatively related (Spicer & Chamberlain, in press), and to have no relationship with BP (Knight, Chisholm, Paulin & Waal-Manning, 1991). Further, negative relationships have also been demonstrated between anger *expression* and high BP in women and men, and among Blacks and Whites (Gentry, Chesney, Gary, Hall & Harburg, 1982; Knight et al., 1991) although in one study this relationship held only in men over 40 (Harburg, Gleiberman, Russell & Cooper, 1991). Gold and Johnson (1990) have discussed the possibility of a U-shaped relationship between anger expression and high BP, such that people who are at the extremes of anger expression (very expressive or very suppressive) will have higher BPs than others. This possibility was supported by a study which identified

two subgroups of hypertensives: those who were under-assertive in comparison to normotensives, and those who were more aggressive than normotensives (Manuck et al., 1985).

Habitual anger has been referred to as hostility (Siegel, 1992). Aspects of hostility that seem particularly relevant to cardiovascular disease include suspiciousness, a need to remain constantly on guard against others, and a view of others as dishonest, antisocial and immoral (Wood, 1986). These aspects form a set of social attitudes or stances. As argued previously, the self emerges in social interaction with others, and it is through these interactions that it is continuously negotiated and endorsed. Engaging in social behaviour through which these processes may operate, but doing so with the assumption that other people are basically untrustworthy and therefore constant guard must be maintained, would make it very difficult for these processes to occur at all. In a similar fashion, individuals who engage in social behaviour and language use while feeling extremely angry and either suppressing or expressing this anger would also find it difficult to receive any endorsement of their sense of self. Scherwitz and Canick (1988) suggest that the predisposition for hostility relates to how threatened identity is perceived to be by the individual, and depends on how these threats are dealt with by the individual.

Literature highlighting problems of anger and assertiveness expression as characteristic of hypertensives can also be seen as problems with social skill. Manuck et al. (1985) point out that "assertiveness is obviously a vital interpersonal skill and indicator of social competence" (p. 163). Further, Siegel (1992) has recently suggested that anger is related to social networks, although there are limited empirical data to support this proposition. Individuals who are high in hostility have been found to have fewer social supports than others, and to rate them as less satisfying (Smith & Fromm, 1985, cited in Siegel, 1992). Averill (1982) describes a community survey on anger where in 89% of reported anger experiences the anger target was another human. Averill argues that anger is an interpersonal emotion. It seems that hostility may influence an individual's ability to establish and maintain social ties (Siegel, 1992). As

74

discussed earlier, social networks and supports are inherently part of self-construction processes.

Self-reference

Scherwitz and Canick (1988) have theorised that the psychosocial variables which have been observed as risk factors for coronary heart disease, such as stress producing situations, social support, behaviour patterns, and hostile feelings, can be viewed as manifestations of an underlying process of self and identity. The risk is derived from a misalignment between self and context. This theory was stimulated by findings showing that Type A individuals used twice as many personal pronouns as Type B individuals, and that their use of personal pronouns correlated with anger intensity, SBP and DBP levels (Scherwitz et al., 1978). Further, Scherwitz and colleagues (1983, cited in Scherwitz & Canick, 1988) found that frequency of self-referencing during the Structured Interview in coronary patients' related positively to their history of previous myocardial infarction. Other studies have also shown that Type A individuals do exhibit higher cardiovascular reactivity during language use, and this is especially so among those who frequently use personal pronouns (Scherwitz et al., 1978; Lovallo & Pishkin, 1980).

Based on psychological and psychopathology findings, Scherwitz and Canick (1988) theorize that individuals who continuously use self-references in their talk may do so because they do not experience a consolidated identity or a sense of equilibrium, or because their identity is too rigidly constructed. Those who do not have a consolidated identity use personal pronouns much more frequently in an attempt to define who they are. A fragile or vulnerable identity constantly perceives or experiences threat. This lack of balance in their sense of self plays a critical role in health and illness. This theory is consistent with the present proposal that language is crucial for one's sense of self and the maintenance and continuous renegotiation of this self. However, Scherwitz and Canick see the construction of identity as a cognitive process, a process that provides an operational definition to the question

"who am I?", through self-referential activity. This conceptualization is limited in its focus on the cognitive aspect of identity construction. The construction of identity, or a sense of self, occurs through all language use, and the use of self-references is merely a particularly salient aspect of this process. Nevertheless, Scherwitz and Canick have provided a valuable way of interpreting empirical data on BP reactivity, Type A behaviour, coronary heart disease and self-referencing.

Sex and Race

There are sex and race differences in BP levels and incidence of cardiovascular disease. Rather than viewing these differences as solely due to inherent biological factors, they can be explained by other factors that have been shown to be linked to BP and cardiovascular disease. As Kasl and Rapp (1991) point out, the distinction between biological individual difference variables and environmental exposure variables is somewhat blurred and unworkable.

Race differences in resting BP levels have been observed across and within different countries. In New Zealand, a recent study showed that mean resting SBP and DBP were highest in the Maori population, followed by Pacific Islanders, Asians and Europeans (Scragg, Baker, Metcalf & Dryson, 1993). Some of this difference in BP levels was explained by body mass index, but significant differences remained when this factor was controlled for. Wood and Gans (1986) observed similar findings in their study of BP in New Zealand, where Maori adults displayed higher BP levels than Europeans. In the United States, Blacks have a much higher prevalence of hypertension than Whites (Paul, 1979; Dressler, Santos & Viteri, 1986), as well as greater cardiovascular reactivity (Anderson, 1989; Anderson et al., 1992).

Viewing race as an attribute of the person may be useful to some extent in BP and cardiovascular disease research, however this conceptualization ignores the social aspects of the attribute. For example, being Black in the United States broadly indicates specific exposures and experiences. Any relationship between BP and race

76

need not be seen as race-linked differences in personal predispositions, but could be seen as resulting from differences in specific exposures (Kasl & Rapp, 1991). For example, when socioeconomic status is controlled for in analyses of ethnic differences in BP, these differences are reduced to a point of being non-existent (Tyroler, 1977, cited in Dressler, 1982). Being Black is related to lower socioeconomic status, and lower socioeconomic status groups show excess risk for hypertension (Krantz et al., 1987). Blacks and Whites may also differ in unique aspects of their social relationships, and this might contribute to the known race differences in cardiovascular disease (Antonucci & Johnson, 1994). Generally, Blacks, older people and the poor are less socially integrated (House, 1987, cited in House et al., 1988). In a similar manner, Marmot (1983) has argued that the low rate of heart disease among Japanese and American-Japanese may be partly explained by the high degree of social support in the Japanese culture. The types of support (i.e. emotional, instrumental, kin or peers) that are related to BP levels appear to be culturally dependent (Dressler, 1991; Dressler, Mata, et al., 1986).

People of an ethnic origin that does not form the dominant culture in a country must operate in at least two cultures simultaneously. Different cultures inevitably have different beliefs, customs and worldviews, and these are often conflicting. Attempting to take part and be involved in both cultures makes negotiating a clear and consistent sense of self difficult. As the rules and language games continuously shift across different situations, endorsing and maintaining a sense of self may be prevented. This difficulty is likely to be reflected in physiological systems, including the cardiovascular system, as well as health and disease generally.

Triandis (1976) has discussed differences in perceptions in Blacks and Whites which were summarized as "ecosystem distrust". This is a view that entities in the environment, including people, things and institutions, are potentially harmful, and the individual does not feel as though anything can be done to improve their situation (Anderson, 1989). Such a distrusting view would make it difficult to receive endorsement of one's sense of self when operating in the dominant culture, which

differs already in terms of traditions, customs and values. Anderson discusses this difference as a possible influence on how Blacks and Whites perceive the laboratory situation and thus their cardiovascular reactivity in this setting.

In New Zealand the European culture is currently dominant, and Maori adults have been found to have higher BPs than European adults. However, in their study, Wood and Gans (1986) did not observe this difference in Maori youth, where Maori BPs were lower than European BPs. A crossover in these BP differences occurred in early adulthood. This study took place in a small community, partly on a Maori marae, and these authors pointed out that Maori youth have a rich community life and few of them identify completely with the Weltanschauung of the Pakeha. Further, they observed that as Maori youth enter adulthood, it is often a futile attempt for them to gain employment. When employment is achieved it is usually in a European dominated industry. This is consistent with the suggestion that interacting in a non-dominant culture which can be foreign in terms of traditions, customs, institutions, as well as its language games and genres, elicits greater cardiovascular response, which can lead to higher BP levels.

There are also sex differences in BP levels and cardiovascular disease. Men have a much higher incidence of coronary heart disease and mortality than women (Jenkins, 1988; Davidson, 1994), even though this is the leading cause of death in the United States for men and women (United States Bureau of Statistics, 1987, cited in Girdler et al., 1990). Overall, men are twice as likely to develop coronary heart disease than women in the United States. Men also have higher rates of hypertension than women, being at one and a half times more at risk (Harlan, 1987, cited in Girdler, Pedersen, Stern & Light, 1993).

The types of social relationships experienced by men and women may help contribute to their differences in BP levels and cardiovascular disease. Friendship and support are often gender specific, and it has been demonstrated that men and women experience support in different ways and with different outcomes (Janes, 1990). As

Sarason, Sarason and Pierce (1990) note, the early socialization of males in Western culture de-emphasizes sharing emotions and any kind of negative self-disclosure. The nature of women's relationships, being more confiding, self-disclosing and open may enable more opportunity for self-construction processes to take place, in more familiar and comfortable contexts than occurs for men. The literature shows that there are also sex differences in the kinds of support men and women receive from their spouses. Husbands tend to receive more emotional support from their spouses, whereas women tend to receive this from other family members (Sarason et al., 1990). Research clearly demonstrates that for men, being married is more beneficial and becoming widowed more detrimental to health than it is for women (House et al., 1988).

Language and Health

The present conceptualization draws together findings from the cardiovascular reactivity field, as well as those on resting BP levels, hypertension, and cardiovascular disease. Other researchers have also begun to focus on language in their theorizations regarding health and illness. For example, Totman (1982, 1985, 1988) has drawn on social constructionism ideas to provide a conceptual scheme of the 'interface' between psychological and physiological processes. His theory is based on the vast amount of research regarding social circumstances and illness, and states that people stay healthy by being social - by engaging in justified action. He focuses on the regulative rules created by language, which are inherent in any socially organized collection of individuals. These rules provide social cohesion and exclusion within a social group (Totman, 1982). Gossip is a clear example of regulatory rules in language, being full of endorsements and criticisms of the acts of others, and continuously maintaining and publishing standards of actions, speech, character and so on. Being social is justifying action through these rules.

Similarly, doing things together in a group, by talk or manipulative action, creates and maintains a local social order (Totman, 1985). This social order provides meaning for

79

individuals. Rules are shared and familiar, and constantly endorsed during talk. Yet socialness lies not only in talk but also in action - the recluse engages in activities whose values are widely endorsed. Thus, the social order, the rules of the community and the social practices of a culture are intimately tied to personhood. Justificatory action stems from these rules and practices, as does individual and social meaning.

Totman argues that vulnerability to illness occurs when the relation between the individual and the collective goes bad. As Oatley (1992) explains, "without frequent registrations of actions and emotions, or verbal endorsements of them, with the rules of the community in which we live, we lose a sense of identity and worth" (p. 275). Therefore, a drop in the time spent in justificatory activity leads to a loss of meaning and vulnerability to illness. Further, ambiguity in the social structure leaves the individual isolated, without direction, and deprived of an opportunity to act, and thereby to relate to the collective in a socially meaningful way. This perspective has enabled Totman to integrate many findings regarding social circumstances and illness.

Direct evidence for the link between actual language use and physical health comes from research carried out by Pennebaker and colleagues. In a series of studies, these researchers have demonstrated that talking or writing about a traumatic event in one's life has a positive impact on health. Pennebaker and Susman (1988) found that among a group of 200 employees, those who had experienced a trauma but had not confided it to anyone were more likely to have reported minor and major health problems (including high BP, skin rashes, and weight loss) than those who had experienced a trauma but had discussed it, or those who had not experienced a trauma. Further, a number of experimental studies have compared the health of participants writing about a traumatic or personally upsetting event with participants writing about trivial topics, over a number of consecutive days. The results show that writing about traumatic events is associated with higher BP and negative mood following the writing (Pennebaker & Beall, 1986), but also with fewer health centre visits for illness in the following six months (Pennebaker & Beall, 1986; Pennebaker, Kiecolt-Glaser & Glaser, 1988), as well as enhanced immune function (Pennebaker, Hughes &

O'Heeron, 1988) and drops in selected blood measures (Francis & Pennebaker, 1992).

Drawing on these findings, Pennebaker (1988, 1990) has proposed a theory of inhibition and health based on the idea that to hold back one's thoughts, feelings or behaviours requires physiological work, most notably increases in autonomic system activity. Short-term inhibition increases skin conductance levels, HR and BP. Further, he argues that over the longer term the work of inhibition can create or exacerbate illness and health problems. Pennebaker (1988) contends that language plays a key role in this process, and that writing about a personal experience within a particular context helps a person to integrate their self-view with the context itself. Such disclosure of aspects of a person's self aids in assimilating them into memory. According to Pennebaker (1990), writing is able to bring a new understanding to events, and participants who are asked to describe their writing experience often use words like realize, understand, resolve, and work through.

The work carried out by Pennebaker and his colleagues also emphasizes the importance of trivial and personal information in constructing a sense of self. Their research has shown that writing about personal traumatic events is beneficial for psychological and physical well-being, yet this is not the case when trivial events are written about. These authors propose that confiding or confronting the perceptions and feelings associated with a traumatic event allows for the integration or cognitive reorganization of the event (Pennebaker, 1988).

However, from a social constructionist perspective, the role of language would play a far greater part in the explanation of these intriguing findings than Pennebaker suggests. Rather than viewing disclosure· through writing as a way of 'translating' a phenomenon into language from a non-language, cognitive form (Pennebaker, 1990), a social constructionist account would claim that language helps to construct not just an interpretation of the event, but the event itself, and how it was experienced and remembered. Thus, writing about a personal experience actively incorporates the experience into the author's sense of self. Using language to describe a personal

81

traumatic event enables it to be negotiated and actively worked in to the individual's sense of self. A personal event such as this is more central to the self (as we understand it in our present social, cultural and historical location) than is any trivial information.

Litowitz and Gundlach (1987) highlight the beneficial use of writing in the psychotherapeutic process, which helps to facilitate this process and to reflect its progress. As they aptly describe, "we might see writing as another form of symbolic communication between self and other through which a sense of self (true self, identity) develops" (p. 83). Writing differs from speaking in that it leaves a trace that may endure over time and space, and like any language use, it is inherently social. Thus, it arises out of and inevitably embodies personal relationships (Litowitz & Gundlach, 1987). However, a recent study examining the effect of emotional disclosure on immune function found that verbal disclosure was actually related to increased immune system functioning more than written disclosure (Esterling, Antoni, Fletcher, Margulies & Schneiderman, 1994).

In summary, previous researchers have theorised the role of language in affecting physical health. The current conceptual scheme also links language with physiology through the idea of self-construction processes, and has been able to integrate various findings on resting BP levels and cardiovascular disease. This theoretical account will be outlined more explicitly in the following chapter, and hypotheses will be derived so that they can be tested empirically.

Chapter 4

Self Construction Processes and Cardiovascular Reactivity:

A Theoretical Account

The very being of man (both internal and external) is a profound communication. To be means to communicate. (Bakhtin, 1986)

So far as anyone has been able to ascertain, there are only two human realities: physiology and discourse (conversation) - the former an individual phenomenon, the latter collective. (Harré, 1990)

Summary of the Argument

According to the proposed conceptual scheme, language use constructs and maintains an individual's sense of self. Such a notion has been put forward many times and is taken as given by social constructionists in various disciplines, as discussed in Chapter 1. I have argued that this function of language use has physiological correlates at the cardiovascular level. Empirical research clearly demonstrates that any kind of language use is associated with cardiovascular reactivity. Further, there are certain factors regarding language use which are important in self-construction processes. These factors can be conceptualized as related to the extent to which the cardiovascular system is reactive during language use. Based on the results of many studies, it appears that the cardiovascular system is more reactive when self-construction processes are more obvious and dominant for the individual - when the individual is explicitly constructing and maintaining a sense of self, or conversely, when the individual is having trouble or difficulty doing so. A sense of self is continuously constructed and renegotiated through language. When the usual endorsement and validation of an individual's sense of self is not forthcoming, however, the cardiovascular system is particularly reactive.

Three aspects of language use seem to influence how central it is to self-construction

processes and the ease with which an individual receives endorsement of their sense of self. Firstly, the content of the language is crucial. Content that is about the self is more central to the construction of a sense of self than content that is more trivial or peripheral to the speaker. Secondly, the context in which the language is used is also an important aspect of self-construction processes. The context influences the language that is used, the language games that the speaker takes part in, and the language genres through which communication between speakers takes place. Should the context be unfamiliar (in terms of the language, the place, or the other participants), an individual would have difficulty maintaining and endorsing their sense of self. Finally, the types of resources an individual brings to any speaking situation influences self-construction processes and how they occur. For example, individuals may differ in their history of receiving endorsement of their sense of self, and this may influence self-construction processes during any particular language episode.

These ideas gain more support due to the fact that they are able to be applied to broader findings regarding resting BP levels and cardiovascular disease. Moreover, they provide a framework within which to conceptually integrate many of the diverse findings in these areas. As outlined in Chapter 3, the reactivity hypothesis suggests that prolonged and extensive cardiovascular reactivity can, over a period of time, lead to heightened resting BP and cardiovascular disease. Examination of the types of social and psychological factors associated with both high BP and cardiovascular disease showed that they can be conceptualized in self-construction terms.

The argument presented here is speculative and rather sweeping. However, as Luckmann (1983) has pointed out, we should not be shy of theorizing, or even speculating, in areas of research that are almost overburdened with data. There are many findings linking psychosocial variables with BP, cardiovascular reactivity and cardiovascular disease. When these findings are considered together, themes and patterns emerge which can be conceptualized in self-construction terms. The framework that has been outlined accounts for many existing data patterns and is at a high level of abstraction. To examine this framework more explicitly, it can and

should be tested empirically with new data, using logically derived operationalisations. By drawing out important constructs and testing their relationships, it will be possible to examine and gain further understanding of cardiovascular reactivity during specific episodes of language use, and how it relates to the centrality of the language to self-construction processes and individual resources that are brought to the situation. In the following section, important concepts regarding self-construction are explicated in order to provide a focused and empirically testable theory.

Important Factors in Self-Construction Processes

There are a number of factors that are central to self-construction processes. The main one is language use, for it is language that constructs our social worlds, including our sense of self. However, language use that occurs during conversations with another person are especially salient for self-construction processes. Conversation is the ultimate realm in which self-construction occurs, and according to Shotter (1993b), is the primary human reality, where mutual judgements and evaluations take place. It is also the place where shared meanings and agreements are reached, both for oneself and for others.

Three features of language use and conversation appear to influence self-construction processes: the content of the language itself; the context in which the language is used, or the conversation occurs; and the resources that the individual brings to a specific language episode. These three features affect the type of self-construction that is occurring, such as whether the individual simply maintains and receives endorsement of their sense of self, whether active renegotiation is undertaken, or whether the expected endorsement is not forthcoming and active renegotiation of a sense of self is also thwarted or hindered in some way.

Conversation Context

The context in which a conversation occurs affects self-construction processes. A situation which is familiar and where speakers are known to one another provides a context where shared speech genres are employed and the same social languages are used and understood. As language is constructive, formulating and shaping what is known and what it is possible to say, these shared speech genres and languages mean that speakers also share a way of viewing and experiencing the world. Further, the rules of engaging in a conversation are clear and are also shared by speakers. These aspects of the situation combine to form a context in which an individual can receive endorsement and affirmation of their sense of self during a conversation.

However, unfamiliar situations and unknown speakers may make receiving such endorsement of one's sense of self much more difficult. The speech genres may be unfamiliar, making it difficult for the speaker to participate in a comfortable way and to negotiate a sense of self. In unfamiliar contexts, it is unlikely that a speaker will endorse their ongoing and coherent sense of self with ease. Rather, more renegotiation and active construction is likely to occur as the speaker engages in conversation with others. If other participants are unknown to the speaker, more negotiation is expected to occur as the speaker makes him or herself known for the first time, through conversation. Any study of self-construction processes will require a situation in which they can operate to a sufficient degree. Engaging in conversation enables self-construction processes to occur, and engaging in conversation in an unfamiliar context enables them to occur to a sufficient degree. According to the present framework, conversing with an individual in a context which is unfamiliar (where the setting is new and participants are not known well) should be more central for self-construction than a context which is usual and familiar, and in which the individual feels comfortable. An unfamiliar context is likely to be related to more active renegotiation of a sense of self during language use, challenging rather than endorsing this sense of self. Thus, engaging an individual in a specific language episode, such as a conversation with an unfamiliar person, in a particular social context which is also

unfamiliar, is likely to provide the opportunity to study self-construction processes. As will be outlined, an experimental laboratory provides this kind of social context.

Language Content

During any particular conversation, self-construction occurs to different degrees for various people. However, due to their very nature, certain topics of talk will enable more active self-construction processes for all speakers. As noted previously, talk that is focused on the self is more central to constructing the speaker's sense of self than is talk on other topics.

The experience and sense of the self is profoundly influenced by cultural assumptions about the self (Andersen, 1987). These assumptions provide the basis for deciding which types of information are seen as important and informative in self-knowledge and in constructing a sense of self. Andersen (1987) points out that in Western culture, individuals may be more likely to perceive information about the self as important, accurate and diagnostic if it is consistent with assumptions about the self that hold in our society, for example if it is somehow intentional, uncontrollable, private or distinctive. Thus, weight is given to subjective thoughts and feelings, including wishes, goals, moods and emotions, which are seen as being derived as from 'within' the person and as more private than other more public aspects of the self.

Although thoughts and feelings are considered more distinctive and idiosyncratic than are overt behaviours, they are not necessarily so. Social constructionists do not assume a difference between a public world and a private one, for according to these theorists, there is only relatedness. As Gergen points out, the private world is simply the public and the relational done alone (Misra, 1993). However, people experience thoughts and feelings as occurring within themselves, given to others only when the individual chooses to communicate them, and as private and individual (Andersen, 1987).

Due to the emphasis private information about oneself is given in the Western culture, it is an important source of information that individuals use in constructing their sense of self. Therefore, it is likely that when an individual engages in a conversation in which they talk about private aspects of their self, more active negotiation of a sense of self will take place than when they talk about other topics. On the other hand, information about the self that is already known and available to others, such as one's behaviour, actions, relatedness to others, or social position, may not be given so much emphasis in self-construction. While talking about this information is still likely to be central to a sense of self and will be related to self-construction processes, it may not be as central as talking about private aspects of oneself.

In contrast, engaging in a conversation which is not focused on the self at all will not be central to self-construction. Such talk will still activate self-construction processes for an individual, as all language use is constructive for one's sense of self. However, as the talk is not about the self, these processes will not be so salient or active. Rather, it is likely that when an individual talks about non-self topics, they will maintain their ongoing sense of self. These differences in self-construction processes across various kinds of talk are expected to be related to speakers' cardiovascular activity. This can be examined by asking people to converse about topics that are specifically concerned with private and public aspects of the self, or topics that are not directly focused on the self. However, these differences are not likely to be absolute: they will depend on the speakers themselves, their expectations and their histories of constructing a sense of self in conversation.

Individual Resources

What makes an individual unique, and provides a unique sense of self, is not just the place or position that they occupy at any one point in time, but also *how* they came to occupy it (Shotter, 1993b). Individuals differ in the extent to which they have negotiated and received endorsement of their sense of self through language use. Some individuals may have stable histories of successfully negotiating a coherent,

continuous sense of self through language use, while others may have histories of continuously renegotiating and reconstructing their sense of self during language use and conversation. These differences are likely to affect the self-construction processes that occur during any particular language episode.

As discussed in Chapter 2, evidence shows that there are individual differences in cardiovascular reactivity (Sherwood & Turner, 1992). Various factors can be drawn from the language-construction framework that highlight individual differences in the way a sense of self is, in general, renegotiated and endorsed during language use. In the present framework, these factors have been termed individual resources, to highlight the notion that even though they are individual differences, they have been developed relationally in the social sphere. These factors can be investigated to see if they relate to differences in cardiovascular reactivity between individuals, thus providing an indirect test of the link between self-construction and cardiovascular reactivity.

Self-Consciousness

While private thoughts and feelings play a major role in Western discourses of the self, there are individual differences in the extent to which people attend to their internal moods, feelings and reactions or to their public behaviour and appearance. These differences have been found in research on the construct of self-consciousness, derived from self-awareness theory. This evidence shows that people differ in their tendency to focus and direct attention towards public or private aspects of the self (Scheier & Carver, 1977). Public self-consciousness is the tendency to focus on the self as a social object, while private self-consciousness is a tendency to focus on covert or personal aspects of the self (Markus & Cross, 1990).

As expected, people who are high in private self-consciousness have been found to be more concerned with personal aspects of identity, such as feelings and emotions, whereas those high in public self-consciousness showed a greater tendency to focus

on their social identity, such as their popularity and attractiveness to others (Cheek & Briggs, 1982, cited in Singer & Bonanno, 1990). Further, compared to people who do not tend to focus on either aspect of themselves, people who are high in public self-consciousness (Shaffer & Tomarelli, 1989) or in private self-consciousness (Franzoi & Davis, 1985, cited in Markus & Cross, 1990) have been found to report more willingness to make intimate self-disclosures to others. Fenigstein (1979) has also shown that people who are high in either public or private self-consciousness are more responsive to the evaluations of others during social interaction. Scheier and Carver (1977) propose that social anxiety is a derivative of public self-consciousness. People who are high in public self-consciousness are fully aware of themselves as social objects, and according to these authors, such people may evaluate themselves and become apprehensive.

Thus, in constructing and negotiating a sense of self, people seem to differ in the weight they give to various sources of information about themselves. Some people chronically attend to public aspects of themselves, some to private aspects, and some to both, while others do not tend to focus on either. This source of individual differences suggests that people may vary in the extent to which certain types of information are central to processes of self-construction during language use. It may be that while the language content is related to cardiovascular reactivity in all individuals, the extent of this may depend on their public or private self-consciousness resources. People who do not focus on either the public or private aspects of themselves may find it difficult to obtain endorsement of their sense of self during language use about the self. In this sense being low in public or private self-consciousness may actually hinder self-construction processes and lead to greater cardiovascular reactivity during certain types of language use.

Social Competence

Social competence is a dispositional factor which has been theorised about both in the cardiovascular reactivity and resting BP areas. It is concerned with a person's

capability to respond appropriately in interpersonal situations, including nonverbally, verbally and paralinguistically (e.g. with the appropriate voice tone, etc.) (Manuck et al., 1985). Social competence is a social skill and involves perceiving and acting appropriately. Social incompetence is an interpersonal deficiency, such that inappropriate responses are made in social situations. Ralph (1990) devised a novel way of assessing and studying social competence during dyadic interaction, and interpreted his findings as showing that competence in interpersonal interactions concerns the effect of a conversant's utterances on the other conversant's utterances, and vice versa.

Social competence is central to self-construction processes, for these occur during social situations and verbal interaction. In any social situation, social skills are necessary for mutual understandings and to enable successful relating between individuals. Certainly with interpersonal problems, discrimination and skill are required so they can be dealt with in a mutually satisfying way (Linden & Feuerstein, 1981). However, even more generally, such skills are required for the successful carrying out of everyday conversations, an important activity for self-construction. As mentioned in Chapter 3, people lacking in social competence would find it difficult to take part in the relatedness necessary for self-construction processes to occur. By definition they would not have the resources to engage in certain language games and language genres, thereby finding them difficult to use in particular situations. Such a deficit would hinder processes of negotiation and endorsement of a sense of self during language use and interaction with others. Social competence is clearly an individual resource that develops in social interaction.

The present theory predicts that individuals exhibit greater cardiovascular reactivity during conversations about the self than during non-self conversations. This response may be further heightened among those people who are lacking in social skills, and who would find receiving endorsement and negotiating their sense of self difficult. Conversely, people who are socially competent would be expected to glide through social situations, easily using the language genre applicable to the situation, through

which they would be able to endorse and maintain their sense of self. These individuals would be familiar with interaction rules and the language games of many different situations, so while language use may be related to cardiovascular reactivity across different conversational content, this would be minimal in comparison to others without such skills.

Extent and Comfort of Conversing

Engaging in conversation is primary to self-construction. How comfortable an individual feels in any given talking situation, and whether they are able to take part in the language games and speech genres, depends to a large extent on their past history of language use and talking. This past history can be seen as a type of resource the individual carries into a particular language episode with him or her, and it will influence many aspects of self-construction processes.

The research evidence discussed in Chapters 2 and 3 shows that social support and social networks impact on cardiovascular reactivity, resting BP levels and cardiovascular disease. These constructs are central to self-construction processes, as they help to determine how often an individual uses language (frequency), the types of things he or she talks about (content), as well as the situations in which the language is used. Generally, a person high in social support talks to supportive others in familiar and comfortable contexts. The research indicates that the presence of even one confiding relationship serves as a protective buffer against depression (Surtees, 1980) and loss of social interactions and roles (Lowenthal & Haven, 1968).

There are aspects of social support that are particularly relevant for self-construction processes. These are the conversational nature of support (for example, having people to talk to) and the supportive contexts in which these conversations take place. Engaging in conversations with others, and feeling comfortable while doing so, would provide the opportunity for the negotiation and reaffirmation of one's sense of self. These opportunities would provide the individual with a sense of 'belonging' in the

community, being able to develop oneself through it and being able to contribute to its ways of making sense (Shotter, 1993b). These are the times and the places where shared understandings are created and language games developed and endorsed. As such, they are essential to the construction of a sense of self for the people taking part. People not taking part will therefore bring a different history of self-construction processes to language situations.

The more an individual engages in conversation, the more opportunity there is for self-construction processes to operate. Therefore, the frequency with which an individual takes part in conversation will influence (to some degree) the extent of self-construction processes that have occurred during talk. Speakers will bring a different history to any particular conversational episode, such that those who take part in many conversations will enter the new episode with more practise and more familiarity with conversation than those who tend to take part in fewer conversations.

The comfort which an individual feels during conversations also impacts on self-construction processes during any particular language episode. People with a history of feeling comfortable in conversations would be competent with speech genres and language games. The tendency to feel comfortable during conversations implies a sense of belongingness, not necessarily in the particular situation in which a conversation occurs, but more generally. It is also likely to be related to more maintenance, endorsement and affirmation of one's sense of self during language use than to continual active renegotiation and reconstruction. For this reason, individuals who tend to feel more comfortable during conversations would expect to receive endorsement of their sense of self during any new language situation more than other individuals.

Disclosure

Self-disclosure has been defined as any information about oneself that an individual communicates verbally to another person (Cozby, 1973). Research into self-disclosure

has involved examining both the act of disclosing, as well as individual differences in self-disclosure. Self-disclosure often occurs within the context of conversations. Holtgraves (1990) has emphasised the importance of this, pointing out that the ability to carry on a conversation is a social skill requiring knowledge of relevant rules and so on. In a similar manner, the ability to self-disclose can also be viewed as a skill, although given the threatening nature of disclosure, it may be that even greater skill is required. The act of disclosing has also been found to play a central role in the development and maintenance of relationships (Collins & Miller, 1994; Altman & Taylor, 1973; Shaffer & Tomarelli, 1989; Prisbell & Dallinger, 1991).

Both conversation and relationships with others are central to self-construction processes. A person's tendency to disclose affects the frequency with which they have talked with others in the past about themselves. Both frequency and content of past talk are central to constructing a sense of self. Jaffe (1984, cited in Burnard & Morrison, 1992) has described disclosure in terms of self-renewal, arguing that after people experience an event or series of life events, they need to gradually disclose this to others in order to regain their sense of self. However, I would argue that people are maintaining their sense of self continuously through any acts of language use, although particularly when disclosing personal information. Therefore, a further factor that can be seen to be important in an individual's past history of negotiating a sense of self through talk is the amount they self-disclose.

Compared to people who do not tend to disclose, those who do would generally be more comfortable when they talk about themselves, for they would be more practised in this activity. These people would also be more familiar with the contexts in which such self-disclosures occur and with the language genres that are used in self-disclosing conversations. Therefore, in any new situation in which an individual discloses personal information about him or herself, those who bring a history of disclosure will be more familiar with the rules of this activity and the language genres that can be used. This ease of carrying on the conversation would enable endorsement of the individual's sense of self through the language use - it would reaffirm this sense

of self. Further, one's history of self-disclosure may also have an influence on processes of self-construction during more general language use. Those who have disclosed more have had more negotiation and endorsement of their sense of self through language than others, for disclosure contains content that is central to this sense of self. These people would, therefore, bring a history of receiving such endorsement regarding their self, and feel more comfortable in language situations which can all be viewed as concerning the self to some extent.

These ideas regarding self-disclosure may be tested to see if they are related to cardiovascular activity. During language use, individuals who bring a history of self-disclosure to this activity would be expected to be more familiar and comfortable with the language, and therefore display less cardiovascular reactivity than individuals who do not have a history of self-disclosure, depending on the content. In other words, language content is expected to be related to cardiovascular reactivity, but the extent of this reactivity depends upon individuals' self-disclosure resources.

Combined Individual Resources

An individual's self-consciousness, social competence, general frequency of conversing, general comfort felt during conversations, and their tendency to disclose to others have all been conceptualized as independent factors that may influence self-construction processes during language use. Although they have been considered separately here, in practice it is very unlikely they would act on their own to affect self-construction. Social situations may engage a number of individual resources, some of which may combine to provide specific groupings of resources that affect self-construction processes during conversation. Certain clusters of the resources outlined here may be particularly central to past and present self-construction processes.

There may be differences among speakers in their past and present construction of a sense of self during conversations based on their conversational nature. The two

aspects of a person's conversational history which appear particularly important for the present theoretical framework are the extent to which an individual engages in conversations, and how comfortable they feel when they are conversing. If these two aspects of conversation are central to self-construction processes that operate during this activity, then considered together as 'conversational resources' they may have an even greater influence on self-construction processes during conversation.

The comfort which an individual tends to experience during conversations may also combine with social competence to affect self-construction processes. If one's sense of self is constructed relationally in the social world, particularly through conversation, then these two factors may be especially relevant to self-construction. This combination can be viewed as a 'social resource', for it focuses on an individual's competence and comfort during situations that are social in nature. Individuals who have the competence to take part in social situations, are competent while doing so, and who feel comfortable during conversations (which are inherently social), are individuals who would be expected to have little active self-construction processes occurring during talk. They are more than able to use the appropriate speech genres and to feel comfortable doing so. Theirs is a sense of belonging, of occupying a particular stable place in the social 'seascape'.

The comfort people generally feel during conversations may also join with their tendency to disclose to provide a 'linguistic' resource which may be especially relevant to self-construction processes. This type of resource emphasizes how much a person has talked about him or herself in the past, and how comfortable they usually feel when they talk. This is relevant to constructing a sense of self during conversations, for self-talk is important for self-construction, as is comfort felt during talk. People who have disclosed a lot and who feel comfortable talking may bring a particular linguistic resource into a conversation episode which enables them to easily obtain endorsement of their sense of self. On the other hand, people who do not tend to talk to others about themselves, and who do not feel comfortable during talk, may not bring much of a linguistic resource into a new situation, and may find constructing

a sense of self, during a conversation about the self, extremely difficult due to the unfamiliarity of the content and the expected discomfort of the conversational situation.

Finally, both private and public self-consciousness may be important for self-construction processes when considered together, but even more so when social competence is also taken into account. This combination of factors focuses on a person's 'stable attributes' rather than their talking history. They can be viewed as more 'internal' to a person compared to the other factors of conversational resources and disclosure, which are more focused on behaviour. As internal, personality-like factors, private self-consciousness, public self-consciousness and social competence will be bought into a social situation with the individual and may affect self-construction processes. An individual who focuses on the self (public or private aspects), and who is socially competent, may find they have the ability to receive endorsement of their sense of self more easily than a person who is not so competent and does not focus on him or herself.

Testing the Theory

The present conceptual scheme enables speculation about important factors in self-construction processes, delineates when and where these processes are expected to operate, and is able to generate hypotheses regarding when the cardiovascular system is expected to be activated (based on self-construction notions), as well as the relative extent of cardiovascular reactivity that is expected to occur.

The Laboratory Context

In order to study aspects of self-construction, it is necessary for self-construction processes to operate to a sufficient degree. One way of achieving this is through the context in which language use occurs. Setting up a context that is unfamiliar to

97

speakers should elicit some form of self-construction. A laboratory setting is unfamiliar for most people, and as such seems a convenient place to study self-construction processes during language use. Asking people to engage in a conversation in such a setting, with a researcher who is not well known to them should provide a context that is likely to elicit self-construction processes to a sufficient degree. Further, specifying the context in which a conversation occurs, and who takes part in that conversation, provides some control over the language genres and language games that are used.

A laboratory setting also enables greater control of numerous variables that would otherwise remain uncontrolled in naturally occurring situations. This is the main reason why it remains the predominant psychophysiological research environment (Cacioppo, Petty & Marshall-Goodell, 1985). Therefore, there are strong theoretical and practical reasons for a laboratory to be used in the present study.

However, many concerns have been raised regarding the ecological or external validity of research carried out in a laboratory setting. Certainly, this applies to many cardiovascular reactivity studies in which there are laboratory tasks of a nonsocial nature (Smith & Christensen, 1992). A review by Lassner et al. (1994) indicated that of the 41 tasks used in cardiovascular reactivity studies which were published in Psychosomatic Medicine during 1988 and 1989, 39 involved tasks which were performed alone. The laboratory context used in the present work will be explicitly social, in that the participants will not be alone, and they will be engaging in conversations.

Hypotheses

There are several hypotheses that can be derived from the theoretical account discussed above. These are delineated and listed below.

General Effect

- Engaging in conversation will be related to increased cardiovascular activity. This is particularly likely to occur given the present laboratory context, which is a relatively new and unfamiliar situation.

Main Effect

- Language content that is more central to a sense of self will be related to greater cardiovascular reactivity. More specifically, engaging in a conversation about aspects of one's private self is expected to be related to greater cardiovascular reactivity than is engaging in conversation about aspects of one's public self, which in turn is expected to be related to greater cardiovascular reactivity than is engaging in a conversation that is not focused on the self.

First Order Interactions

The differences in cardiovascular reactivity between private self, public self and non-self talk will be greater among people who:
- are low in private self-consciousness (who do not tend to focus on private aspects of themselves) compared to people who are high in private self-consciousness.
- are low in public self-consciousness (who do not tend to focus on public aspects of themselves) compared to people who are high in public self-consciousness.
- are not very socially competent compared to people who are socially competent.
- tend not to disclose compared to people who tend to disclose personal information.
- do not usually engage in many conversations compared to people who usually engage in many conversations.
- do not usually feel comfortable during conversations compared to people who usually do feel comfortable during conversations.

Second Order Interactions

The differences in cardiovascular reactivity between private self, public self and non-self talk will be greater among people:

- low in 'social resources', namely those who both do not usually feel comfortable during conversations and who are not very socially competent, compared to people who are high in social resources.

- low in 'linguistic resources', namely those who both do not usually feel comfortable during conversations and who do not tend to disclose, compared to people who are high in linguistic resources.

- low in 'conversational resources', namely those who both do not usually feel comfortable during conversations and who do not usually take part in many conversations, compared to people who are high in conversational resources.

Third Order Interaction

- The differences in cardiovascular reactivity between private self, public self and non-self talk will be greater among people who do not focus on either private or public aspects of themselves, and who are not very socially competent, compared to others.

Participants

As the context is an important factor in self-construction processes, it is important that this is kept consistent across participants in the present study (as much as possible). Men and women tend to have different experiences and different constructions of the world (Lorber & Farrell, 1991). It would be expected that the construction of the context in which the present study occurs will be different according to one's gender. This is particularly emphasised by the social interaction that occurs in this context, namely three conversations with a female researcher. Therefore for the context to be consistent across participants, only one gender should participate in the study.

Although women and men have not been found to exhibit significant differences in BP reactivity during laboratory active speech tasks (Girdler et al., 1990; Light et al., 1993), women continue to be an under-researched population in the cardiovascular reactivity field, as well as the BP and cardiovascular disease field (Suarez, Harlan, Peoples and Williams, 1993). This is true of many, if not most, areas of psychological study. In fact, the psychological study of women emerged from the field of individual differences (Riger, 1992), rather than being valid and important in its own right. This has led to arguments that social science "neglects and distorts the study of women in a systematic bias in favor of men" (Riger, 1992, p. 730). Critics have been highlighting women's invisibility as subjects of research. Over the past two decades there has been a continually growing list of the threats to the validity of research on women (Riger, 1992). Rather than viewing 'male' as the general case in psychological research, and 'female' as the subgroup demarcated by biology (Acker, 1978, cited in Riger, 1992), it is important for researchers to investigate women in their own right. This, in a sense, helps to redress the male-centred bias in science. For these reasons, therefore, the present study includes only women as participants.

Chapter 5
The Pilot Study

Introduction

A pilot study was carried out to explore and investigate conceptual and practical issues involved with running an experiment in which conversations occur while cardiovascular reactivity (BP and HR) is assessed. More specifically, issues regarding the measurement of cardiovascular reactivity, the effectiveness of the research design in eliciting reactivity, and the procedural aspects of engaging people in conversations were investigated.

The pilot study had a number of specific objectives. Firstly, it sought to identify the most optimum length of time for BP and HR to stabilize in an initial accustomisation period, and how best to occupy participants during this. Secondly, consideration was also given to the best definition and measurement of cardiovascular reactivity to provide accurate and valid assessment. Decisions regarding both the definition and the measurement of reactivity guide the choice of baseline periods. Therefore, a third set of objectives in the pilot study concerned baseline measurements: when they should be taken, their length, and what the participants should do during them. A fourth objective was to calculate the effect sizes for cardiovascular reactivity across different talking conditions, in order to assess the number of participants required in the main study to enable adequate statistical power. Further objectives of the pilot study concerned procedural aspects of the experiment. It aimed to help familiarise the researcher with issues such as the timing of experimental sections, operation of equipment, interruptions and possible unexpected occurrences, as well as providing the researcher with practise regarding the conversational nature of the talking sections. Finally, the suitability of the experimental location and participants' responses to this were also assessed.

Measuring Cardiovascular Reactivity

There are a number of issues that need to be considered when measuring cardiovascular reactivity. Firstly, accurate BP and HR readings are required. The cardiovascular system, especially BP, is particularly labile and is influenced by countless internal and external factors, such as slight movement, noise, thoughts and so on. Therefore, an initial period is required to allow the cardiovascular system to stabilize and to become accustomed to the new environment. Secondly, reactivity measures are derived from both baseline and task values, and consideration needs to be given to how baseline measurement is best achieved. Finally, when there are multiple tasks in an experiment, rest periods between tasks are often used to prevent carryover effects. Decisions regarding the length and type of rest period are thus also necessary.

Accustomisation

The length of time provided for participants to become accustomed to the new environment, including the automatically inflating BP cuff, and for cardiovascular systems to stabilize, varies a great deal across BP reactivity research, from 60 seconds (Silverberg & Rosenfeld, 1980) to 30 minutes (Llabre, Spitzer, Saab, Ironson & Schneiderman, 1991). Anywhere between 5 and 15 minutes is the typical length of time used for an initial accustomisation period (e.g. Smith et al., 1990; Smith et al., 1989; Ewart et al., 1991; Matthews, Manuck & Saab, 1986). Thus, previous research does not show a consistent length of time for this initial period, nor provide arguments as to why a 30 minute period might be better than a 5 minute period (although there are arguments based on how to define and accurately measure baseline BP levels, which impact on the duration of the initial period). A shorter time period would be beneficial for pragmatic reasons and make the best use of participants' time.

It appears that in most studies, participants simply sit quietly and still during the accustomisation period, while Matthews et al. (1986) also had their participants listen

to relaxing music. It seems that what participants do during this time is not an issue as long as they do not speak or move, as such activity would automatically influence BP and HR. Providing participants with information about the study for part of this initial period would be useful.

The effectiveness of an accustomisation period of 7 minutes was investigated. Pragmatic reasons suggested that this section be of a fairly short duration with two sections: a first section (2 minutes) in which the researcher talked to the participant regarding the study, and then a further 5 minute rest period. An accustomisation period of five minutes is the shortest usual length of time identified in the literature, and the pilot study investigated whether these durations were long enough for BP and HR levels to stabilize.

Baseline Measurement and Rest Periods

Blood pressure and HR reactivity levels derive their meaning from comparison of task and baseline levels (Krantz & Manuck, 1984), therefore meaningful baseline measurements are important. Most research has used the average of the final 2-3 readings (generally taken at one minute intervals) in the initial accustomisation period as baseline values (e.g. Girdler et al., 1990; Semenchuk & Larkin, 1993; Smith et al., 1989; Smith et al., 1990), although one study used the average of two readings taken during a three-minute period *following* the experimental procedure and completion of a questionnaire as a baseline.

Using only one assessment of baseline, taken following an initial accustomisation period, in an experiment with multiple tasks does not capture BP levels immediately prior to every task. Therefore, this confounds the reactions to one task with those to the preceding task (Jennings, Kamarck, Stewart, Eddy & Johnson, 1992), even though most studies use rest periods between tasks to avoid such carryover effects. These rest periods also vary in duration, from 60 seconds to 20 minutes - something which obviously depends on the specific types of tasks that are required (e.g. physical

exertion tasks require longer rest periods). Rest periods are usually periods of silence, although in some studies they are used to provide the participant with instructions for the next task (e.g. Lynch et al., 1992).

Cardiovascular reactivity has been quantified in two main ways: through the use of delta or residualized change scores. Both yield reliable data (Llabre et al., 1991), although Llabre et al. argue for the use of delta (simple change) scores for simplicity. Most cardiovascular researchers employ delta scores, namely the change in BP or HR from immediately prior to the task to during the task (Jennings et al., 1992). Measuring reactivity in this way makes sense in terms of the law of initial value (Cumes-Rayner & Price, 1988; Llabre et al, 1991). Therefore, Llabre et al. included a pretask baseline before every task. Two studies have side-stepped this issue by making sure that prior to the commencement of the next task, SBP or both DBP and SBP have returned to within 5mmHg of their baseline values (Girdler et al., 1990; Light et al., 1993). Use of pretask baselines would be the most accurate way to calculate BP reactivity, however this also depends on what the participant is doing during the baseline assessment.

The duration and the activity of resting periods and baseline assessments were explored in pilot work. Resting periods between tasks were essential, as were pre-task baselines, to provide useful reactivity data. As the tasks were not physical, long rest periods were not required. According to Lynch et al. (1981), BP levels return to resting levels rapidly and almost immediately following cessation of speech. Therefore, two minute rest periods were used in the pilot study to investigate whether this was long enough for BP and HR levels to return to baseline levels. Immediately following the rest periods, an additional 2 minute baseline period was used. The average of the cardiovascular measurements taken during this baseline were used in calculating reactivity. Cardiovascular reactivity was assessed by using the difference between the average baseline and average task measurements.

What participants do during the rest periods and baselines is an issue that is of

particular relevance to the present study. Rest periods in which participants sit quietly may elicit a wide range of responses, primarily because the tasks employed in the experiment (talking about the self) may generate anxious thoughts, such as participants worrying about what they had just said or what they might be expected to talk about next. Thus, there is very little control during rest periods in which participants sit quietly and relax.

Jennings et al. (1992) argue for the use of a "vanilla" baseline when more than one task is presented, to avoid carryover effects. This type of baseline assessment requires participants to maintain a level of alertness by performing a simple colour detection task on a video screen. Compared to a "resting" baseline, where participants may differ in their compliance to the resting state (e.g. by anxiously awaiting the next task, or by being asleep), a vanilla baseline captures some level of attention. These researchers found that 10 minute vanilla baselines were equal to or better than resting baselines in terms of stability, amplitude and significance of responsivity, and generalizability between sessions on separate days.

A type of vanilla baseline may be the best way to deal with these rest and baseline sections in the present research, to capture participants' attention and maintain it at a consistent and fairly low level. Such a distraction task would also provide some control as to what participants thought about during rest periods. Specifications for a useful distraction task include no talking, no movement, no competitiveness and little cognitive effort. One possible activity that could be used during rest and baseline periods is a 'spot the difference' task, where there are two very detailed (usually cartoon) pictures that look exactly the same, although there are actually a number of small differences between them. This activity would focus the participants' attention and prevent boredom. To eliminate competitive efforts, participants would need to be clearly informed that this is a distraction task only and no interest is taken in how many differences they find, or if they find any at all. Therefore, two different activities during rest and baseline periods were tested in the pilot study, namely sitting and resting quietly, and looking at a spot the difference picture. In this way any

differences in BP levels elicited by the two activities could be determined.

Number of Participants

Unfortunately, there is insufficient literature and statistical information to allow any calculation of the effect sizes and statistical power of this type of research. Therefore, effect sizes of SBP, DBP, HR and MAP across different experimental talking conditions are unknown. Knowledge of such effect sizes would allow an informed decision regarding the number of participants required to gain sufficient statistical power to detect an effect if one existed. Therefore, a further aim of the pilot study was to investigate effect sizes, in order to provide information regarding the minimum number of participants necessary in the main study for sufficient statistical power.

Method

Participants

In order to obtain participants, notices were put up on boards around Massey University, New Zealand, detailing the study and asking female students to provide their name and telephone number if they were interested in taking part. These notices were also distributed to some first year Psychology tutorial classes. Potential participants were then contacted by phone and an appointment time was made. Twenty undergraduate and graduate female students served as participants. Fifteen of these participants provided information regarding their age, which ranged from 18 - 27 with a mean of 20.87 (sd = 2.88).

Context

The context of the experiment was held constant across participants. Participants did not know the researcher and were unfamiliar with the setting and procedure of the

experiment, which took place in a small, soundproof room. An attempt was made to make this room as comfortable and relaxing as possible. Two armchairs were situated diagonally opposite each other, and there was a small coffee table next to the participant's chair. On this table was a cushion for the participant to rest her arm on. Another, taller table with a computer on top of it was situated beside the researcher's chair. Under this table and out of the participant's view were the BP monitor and tape recorder. The walls were covered in posters and pictures, the two largest posters (of Auckland and New Zealand) were placed straight opposite the participant. As the room was soundproof, there was an inner door and an outer door, such that on opening the first door there was another to be opened. The heavier, outside door was always left open, and the inner door was closed.

Language Content

The language content was manipulated by asking participants to engage in three different conversations about aspects of their private self and public self, and about something that was not focused on the self. Three lists of topics were developed to correspond to private self, public self and non-self categories, the definitions of which were based on the public/private distinction of Fenigstein, Scheier and Buss's (1975) self-consciousness scale. Generally, these topics needed to be broad enough to elicit a variety of lengthy responses and enable a dialogue to develop. Participants were asked to look at a list of topics and choose the topic they wished to speak about. Engagement in conversation with the researcher, an explicit attempt for a dialogue rather than a monologue, is central to self-construction processes, reinforces the ecological validity of the situation, and was also expected to help refocus the conversation on the categories, if necessary.

Following two rounds of topic development, where people informally categorized different items into one of the three private self, public self or non-self categories, five items representing each category were selected. The definitions of these and their five topics are outlined below.

Private Self: Aspects of self that are observed by the experiencing person, for example, affects, moods and bodily sensations. These are introspective responses, what happens within:

- Personality characteristics that you feel have changed a lot during your life or have remained the same
- Your personal goals for the next 10 years or so
- Characteristics of yourself that give you pride & satisfaction
- The habits and reactions of yours that you would like to change in an ideal world
- How stress affects you - how you feel both physically and psychologically when you are stressed

Public Self: Aspects of the self that can be observed by other people. These mainly concern presentation and public definition:

- What your hobbies are, and how you spend your spare time
- The types of recreation you take part in
- Movies and TV programs that you watch; literature that you read
- What you are doing/studying at University
- What sorts of clothes you wear most often

Non-Self: Topics that are not directly focused on the self. Any general non-self topic has the potential to be very self-involving, therefore topics that were based on visual stimuli, such as posters and photographs, were used for this section:

- The poster of Auckland that is on the wall
- The poster of New Zealand that is on the wall
- One of the three photos provided (a photo of a balcony with a garden; a photo of a statue of a man with a fish on his head standing in a field; and a photo of a village in Spain).

Four women raters independently categorised this list of 15 items into one of the three private, public and non-self categories. The proportion of agreement between raters for this overall classification was .87, and with chance excluded, .80 (Cohen's kappa; Fleiss, 1971). Therefore, these items were retained for use as topics for the speech conditions of the pilot study.

109

Equipment

The Critikon Dinamap 8100 portable BP monitor was used to measure SBP, DBP, MAP and HR. In automatic BP monitors, MAP is mathematically calculated, being measured indirectly through an oscillatory process that occurs through a computerised stepwise determination. It is described as the value occurring at the point of maximum oscillations within the cuff (Cumes-Rayner & Price, 1988). The Dinamap uses an oscillometric transducer. Calibration of this instrument against a standard sphygmomanometer (Trimline, PyMaH Corp.) showed it provided accurate pressure readings within 2mmHg. The Dinamap monitor was interfaced to an MS-DOS based computer via an RS-232 serial link. Operation of the Dinamap was controlled by computer software which started measurements at regular one minute intervals. The resultant readings were returned and stored on the computer's hard disk along with the time, experimental condition and subject code, for analysis at a later date.

A standard tape recorder and microphone were used to record talking sections for later validation and possible transcription of the three talking conditions. The computer software controlling the Dinamap also emitted an electronic signal at the beginning of each reading. This was combined with the output of the microphone by an audio mixer which was recorded as a small beep on the audiotape. At the completion of each reading, the Dinamap monitor itself gave a short beep and this was also recorded by the audiotape. In this way it was possible to get a time marker on the tape corresponding to each BP and HR reading taken.

Procedure

Participants were requested to refrain from smoking cigarettes, drinking caffeine and engaging in heavy physical exercise for one hour before their appointment time. On a participant's arrival at the research laboratory, the researcher introduced herself, chatted briefly and showed the participant through to the soundproof room. Participants were seated and asked to read the information sheet if they had not

already done so, and sign a consent form (see Appendix A for copies of the information sheet, letter to participants and consent form). The information sheet gave a complete and accurate description of the goals and procedures of the study. All procedures in the study were approved by the Massey University Human Ethics Committee. The researcher then placed the BP cuff on the participant's left arm. All readings were obtained with the arm at heart level, resting on a table.

All participants were involved in three talking conditions, private self, public self and non-self. Prior to each talking section, participants were asked to read a list of five topics and choose one to speak about. Following each talking section was a rest/baseline section. To control for order effects, these three conditions were counterbalanced. Half of the randomly selected pilot participants were required to sit quietly and relax during the rest/baseline periods, while the other half looked at a spot the difference picture. Each talking section was audio-recorded, and proceeded as follows:

Initial: information/instructions given (2 minutes)

   silence or spot the difference activity (5 minutes)

Baseline: silence or spot the difference activity (2 minutes)

For each talking condition:

Choice: instructions given, participant chooses a topic from the list of five

Talk: participant speaks about the topic chosen for at least 2 minutes

Rest: silence or spot the difference activity (2 minutes)

Baseline: silence or spot the difference activity (2 minutes)

Standardized instructions were given for the initial, rest and choice sections. Ten participants received the 'relax' rest/baseline instructions, which asked these people to relax and sit quietly without speaking. The other ten participants received the 'spot the difference' rest/baseline instructions, asking them to look at the pictures and find differences between them. It was emphasized that there was no interest in whether they found any differences or not, and the task was just to provide them with

111

something to do. All the instructions for each section of the experiment are provided in Appendix B.

Validity Check and Feedback

A check on the validity of the language content manipulation was carried out following the experimental procedure by asking participants to comment on whether *they thought* they were actually talking about private self, public self and non-self topics. After eight participants had completed the experiment, it was decided that a quantitative validity check would be desirable. Therefore, the following twelve participants were also requested to read the definition of each talking section, and rate the extent to which their talk in each section was about their public self, private self or not about their self using a 5-point rating scale (0 = not at all, 4 = very much).

Following the experimental procedure, participants were also asked questions concerning what they had thought about during the rest periods and whether they felt bored while they were resting or engaged in the spot the difference task. They were also invited to comment on possible problems, and what they liked and/or disliked about the whole procedure.

Results

The experimental procedure provided physiological data at approximately one-minute intervals for each of four dependent measures: SBP, DBP, HR and MAP. The means of every section in the experimental procedure were calculated for each dependent measure and used for analyses. Therefore, data from each baseline (1-4) and each talking section (public, private and non-self) provided a mean score on SBP (mmHg), DBP (mmHg), HR (beats per minute) and MAP (mmHg) for each participant. As talking sections varied in length, the means for these sections were calculated using either 3, 4, or 5 measurements.

All statistical analyses were carried out using the Statistical Package for Social Sciences (SPSS/PC+), version 4. Variables were examined for missing values and normality of distributions. There were four missing values on three of the variables, and these were dealt with through listwise deletion of cases on each analysis. All variables met univariate normality of distribution assumptions. Two variables had outliers which were three or more standard deviations from the mean, and these cases were deleted from relevant analyses.

Analytic Strategy

To investigate differences in the cardiovascular measures across different experimental conditions, multivariate analysis of variance (MANOVA) was initially used because of the repeated measures design. Physiological measures that are taken close in time often violate the sphericity assumption of repeated measures analysis of variance (ANOVA). Therefore MANOVA was used to check this assumption, and where the assumption held, repeated measures ANOVA was selected as the analysis of choice. Repeated measures ANOVA provides a more powerful test, and power is considered important due to the small sample size in the present study. Where the sphericity assumption was violated, consideration was given to the extent of violation and following the advice of Hertzog and Rovine (1985), adjustment was made to the repeated measures ANOVA result accordingly.

The overall MANOVA, or repeated measures ANOVA, analysis provides an overall test of the main effect. To examine where effects are occurring between the talking conditions, simple planned contrasts between pairs of talking conditions are required (e.g. DBP reactivity during private self talk compared to during non-self talk). However, simple contrasts such as these are nonorthogonal, and only orthogonal contrasts can be requested in the within subjects analysis in SPSS/PC (see Appendix C for further information). To request nonorthogonal contrasts, it is necessary to specify a nonorthogonal transformation of the dependent variables within MANOVA and request an analysis that fits the within subjects model. The analysis is then

carried out on the transformed variables, and provides the overall multivariate and univariate F-test results, as well as specific univariate contrasts between variables. Examples of actual SPSS/PC commands used in this procedure, and their explanation, are provided in Appendix C. These analyses were guided by the technical and statistical advice of David Nicholls, Senior Support Statistician for SPSS (Nicholls, 1995, personal communication).

Measurement of Reactivity

To provide reactivity variables, change scores for each dependent measure were created. This was achieved by using the participant's mean of each talking section and subtracting from it the mean of the preceding baseline (for each dependent measure). In this way, each participant had a reactivity score for each public self, private self, and non-self talking section on each dependent measure.

Correlations between baselines and the reactivity variables were investigated. Mean DBP during the baseline prior to public self talk was moderately correlated with DBP reactivity during public self talk ($r = .39$, p = .094, n = 20). The HR baselines had moderate, negative correlations with their corresponding reactivity variables (public: $r = -.66, p < .001$; private: $r = -.46, p < .049$; non-self: $r = -.67 p < .001$). No other cardiovascular reactivity measure correlated with its baseline values.

However, within the repeated measures analysis in SPSS/PC, it was empirically not possible to partial out the variance of one baseline from its corresponding reactivity variable in the main analyses of reactivity. In other words, one covariate could not be linked with one specific repeated measures variable (e.g. for the variance of 'DBP baseline preceding public talk' to be partialled out of 'DBP reactivity during public talk' only). The baseline variance within a task that was partialled out included the variance for all three baseline variables (e.g. any variance attributable to any of the three preceding DBP baseline variables was partialled out of 'DBP reactivity during public talk', and similarly partialled out of the other talking condition reactivity

114

variables). Therefore, the relationships between DBP and HR baselines with their corresponding reactivity variable were not statistically controlled in any analysis.

Validation of Language Content Manipulation

<u>Verbal Feedback</u>

Most participants commented that during the non-self section they felt their talk was not about themselves. Similarly for the public-self talk, most participants also felt they had spoken about their public self. Comments such as "Yes, I definitely spoke about my public self in that section" and "Yes, I do think other people know about the clothes I wear" were made. One person stated she found it difficult to separate "the links between public and private". For the private self sections, participants also mainly agreed they were talking about their private self, however with qualifications. For example, comments such as "yes, but I'm not really that open", "yes, but it wasn't that personal", and "yes, in a way, but nobody really knows a person" were made. Overall, these comments provide some evidence that the self-talk manipulation was eliciting different speech content. Participants felt there were differences in the content of their speech in each section which corresponded to the private, public and non-self distinctions.

<u>Participants' Ratings of Talking Sections</u>

Twelve participants rated how much they thought their talk during the private and public self sections corresponded to the definition of that section on a 5-point scale, from 0 (not at all) to 4 (very much). The mean for the private section was 3.1 ($sd = 0.67$), and for the public section, 3.2 ($sd = 0.94$). Participants were also asked how much their talk was directly focused on themselves for the non-self section, and the mean response was 1.08 ($sd = 1.38$).

Table 5.1: Univariate F-Values, Means and Standard Deviations of Each Baseline Section for SBP, DBP, HR and MAP (N=17)

Cardiovascular Measure		Baseline				F-value	df
		1	2	3	4		
SBP	M	119.56	120.06	118.09	118.94		
	sd	8.91	9.24	8.67	7.93	1.11	3/48
DBP	M	66.68	60.53	58.32	58.00		
	sd	6.88	9.84	7.68	9.32	15.99***	3/48
HR	M	80.82	79.09	76.91	77.88		
	sd	11.94	10.51	11.01	9.74	7.68***	3/48
MAP	M	87.03	85.38	85.47	85.18		
	sd	8.37	7.46	7.05	7.73	0.94	3/48

*** $p < .001$

Cardiovascular Levels Across Baselines

There were a total of four baseline periods during the experiment: immediately after the initial accustomisation period and prior to the first talking condition; immediately prior to the second talking condition; immediately prior to the third talking condition; and following the final rest period after the third talking condition. Two measurements were taken at each baseline, and the average of these two measurements was used as the baseline score for each participant.

In the initial accustomisation period an average of 6.25 readings (*sd* = 1.02) were taken prior to baseline one. By this time it was expected that BP and HR had stabilized to give fairly accurate assessments of resting levels during the first baseline. It was predicted that the two minutes rest following each talking section would be long enough for BP and HR to return to these resting levels before the next baseline readings were taken. Therefore, the readings taken during the second, third and fourth baselines were predicted to be the same or lower than the readings taken during the first baseline.

The mean of the first baseline was compared to the means of the other three baselines to examine whether differences existed. The means, standard deviations and F-values of each dependent measure for each baseline are shown in Table 5.1. There were no significant differences in SBP or MAP across the four baselines. However, significant overall differences were found in DBP and HR across the baselines. Simple contrasts revealed significant differences in mean DBP between baselines one and two, one and three, as well as one and four (univariate-Fs $(1,16)$ = 15.33; 29.36; 32.56; respectively, all $p < .001$). Similarly, there were significant differences in mean HR between baselines one and two, one and three and one and four (univariate Fs $(1,16)$ = 5.95, $p < .05$; 17.70, $p < .01$; 6.25, $p < .05$; respectively). Both DBP and HR decreased significantly from the first baseline to the second, third and fourth baselines.

Table 5.2: Differences in Mean SBP, DBP, HR and MAP During Spot the Difference and Resting Baseline Activities

Cardiovascular Measure	Spot the Difference Baseline			Resting Baseline			t-value
	n	Mean	SD	n	Mean	SD	
SBP							
First Baseline	11	124.09	8.13	9	115.11	6.19	2.80*
Second Baseline	11	125.36	8.47	9	114.39	4.53	3.70**
Third Baseline	11	123.32	7.22	8	112.69	5.98	3.50**
Fourth Baseline	9	122.39	7.75	8	115.06	6.53	2.12
DBP							
First Baseline	11	69.59	5.77	9	62.11	5.25	3.03**
Second Baseline	11	64.09	7.28	9	55.61	9.36	2.22*
Third Baseline	11	59.54	6.77	8	56.31	8.08	0.92
Fourth Baseline	9	61.28	9.12	8	54.31	8.61	1.62
HR							
First Baseline	11	80.46	10.10	9	79.50	14.27	0.17
Second Baseline	11	79.68	10.12	9	77.44	11.05	0.47
Third Baseline	11	77.55	10.33	8	77.00	11.41	0.11
Fourth Baseline	9	76.50	10.49	8	79.43	9.27	-0.61
MAP							
First Baseline	11	90.00	7.35	9	82.56	7.27	2.27*
Second Baseline	11	89.18	7.30	9	80.61	3.44	3.46**
Third Baseline	11	86.59	7.01	8	83.31	6.17	1.08
Fourth Baseline	9	88.83	7.36	8	81.06	6.16	2.37*

* $p < .05$ ** $p < .01$

Baseline Activity: Resting versus Spot the Difference

Verbal Feedback

Participants who did not do anything during the rest periods nearly all said they thought about the posters on the wall during this time, as well as such things as their University work, boyfriends, and what they were going to do for the rest of the day. One woman said she was hoping she wouldn't get a parking ticket, while three others commented that they had thought about what they had just been talking about in the previous section - that they had changed their mind or forgotten to mention something. Most also said they didn't get very bored. The 'spot-the-difference' participants all said they had concentrated on the pictures in the beginning, however two commented that they had found all the differences (in all 4 sets of pictures) by the third rest period and began to feel bored. Although explicitly not requested, most participants spontaneously provided information regarding how many differences they had discovered in the sets of pictures.

Statistical Analyses

Independent t-tests were carried out to examine whether the two types of baseline activities (resting versus spot the difference) resulted in differences in mean SBP, DBP, HR and MAP during each baseline section. Results are displayed in Table 5.2. The spot the difference activity elicited significantly higher SBP, DBP and MAP during many of the baselines than simply sitting and resting. There was no significant difference in HR during the two activities, however.

Cardiovascular Levels During Talking

In order to assess whether there was a difference in the dependent measures between talking and not talking, overall baseline means were calculated, providing each participant with an average score for all baseline measurements. Similarly, overall

117

Table 5.3: Paired t-Values, Means and Standard Deviations of Talking and Baseline Sections for SBP, DBP, HR and MAP (N=17)

Cardiovascular Measure		Talking	Baseline	t-value
SBP	M	127.11	119.16	
	sd	9.33	8.21	7.50***
DBP	M	69.78	60.88	
	sd	10.71	7.72	7.57***
HR	M	84.46	78.68	
	sd	8.36	10.61	5.42***
MAP	M	93.69	85.77	
	sd	9.40	6.99	5.78***

*** $p < .001$

Table 5.4: Univariate F-Values, Means and Standard Deviations of Each Talking Section for SBP, DBP, HR and MAP (N=20)

Cardiovascular Measure		Private Self	Public Self	Non Self	F-value	df
SBP	M	129.06	127.07	125.19		
	sd	10.16	9.47	10.06	2.55	2/38
DBP	M	71.92	68.02	66.16		
	sd	11.31	11.90	10.32	5.53**	2/38
HR	M	85.29	83.66	82.44		
	sd	10.70	8.42	8.40	2.66[a]	2/18
MAP	M	95.13	91.73	90.92		
	sd	10.46	9.96	9.70	4.35*	2/38

[a] Pillais' approximate multivariate F-value (used due to violation of sphericity assumption)
* $p < .05$ ** $p < .01$

talking means were calculated, collapsing the private, public and non-self sections together. Paired t-tests were used to investigate differences between the average talk and baseline scores for each dependent measure. As Table 5.3 shows, all measures were significantly higher during talking than they were during baseline.

Differences between the three specific talking sections were examined using repeated measures ANOVA on each dependent measure. Omnibus results are displayed in Table 5.4, and indicate there were overall significant differences between talking sections for DBP and MAP. Specific comparisons between the talking sections using MANOVA revealed that both DBP and MAP were significantly higher during the private self talking section than both the public self talking section ($F(1,19) = 4.43$, $p = 0.05$; $F(1,19) = 4.48$, $p = 0.05$; respectively), and the non-self section ($F(1,19) = 11.62$, $p = .003$; $F(1,19) = 8.07$, $p = .010$; respectively). No significant differences in DBP and MAP were found between the public self and non-self talking sections, however ($F(1,19) = 1.13$, n.s.; $F(1,19) = 0.32$, n.s., respectively).

Cardiovascular Reactivity During Talking

Separate repeated measures ANOVAS were used to assess whether reactivity differed across the three talking conditions for each dependent variable. The means, standard deviations and F-values for these analyses are shown in Table 5.5. These omnibus tests revealed that there were significant differences in MAP reactivity across the talking conditions, and the differences in SBP and DBP reactivity approached significance.

Specific contrasts were carried out for all dependent measures to examine where these differences were occurring. These results are displayed in Table 5.6. SBP reactivity was significantly higher during the private self talking section than the non-self sections, as was MAP reactivity. DBP reactivity was significantly higher during public self talk than during non-self talk. There was no significant difference in reactivity between the private and public self talking sections for any cardiovascular

118

Table 5.5: F-Values, Means and Standard Deviations of SBP, DBP, HR and MAP Reactivity Across Three Talking Sections

Reactivity Measure		Private Self	Public Self	Non Self	N	F-value	df	p-value
ΔSBP	M	9.19	8.20	5.06				
	sd	8.13	5.05	7.00	19	2.54[a]	2/36	.09
ΔDBP	M	9.86	5.52	6.48				
	sd	8.99	5.71	6.49	19	2.94[b]	2/17	.08
ΔHR	M	6.56	5.56	4.28				
	sd	6.33	5.00	5.24	19	1.11[b]	2/17	.35
ΔMAP	M	11.14	7.15	5.59				
	sd	7.07	5.64	7.10	18	4.83[a]	2/34	.01

[a] Univariate F-value
[b] Pillais' approximate multivariate F-value (used due to violation of sphericity assumption)

Table 5.6: Simple Contrasts of Talking Conditions on SBP, DBP, HR and MAP Reactivity

Reactivity Measure	df	Private Vs Public		Public Vs Non		Private Vs Non	
		F	p-value	F	p-value	F	p-value
ΔSBP	1/18	0.24	.63	2.72	.12	5.13	.04
ΔDBP	1/18	5.91	.03	0.47	.50	2.35	.14
ΔHR	1/18	0.63	.44	1.74	.20	2.03	.17
ΔMAP	1/17	3.81	.07	0.88	.36	9.54	.01

measure, although MAP reactivity approached significance.

Effect Sizes and Statistical Power

The following effect sizes and power levels are based on the repeated measures ANOVA analyses and have been calculated using Cohen's (1977) power tables and formulae. The observed main effect size for SBP reactivity across talking conditions was .27, which is a medium effect for the ANOVA statistical test (Cohen, 1977). With 2,36 degrees of freedom, N of 19 and alpha set at .05, the power of this analysis is 36%. To increase power to 80% using this ES and alpha, there would need to be 52 participants.

The observed effect size for DBP Reactivity across the three conditions was slightly higher for DBP reactivity at .33. With 2,36 df, N of 19 and alpha set at .05, power is 71%. To increase power to 80%, 36 participants would be required. The effect size was slightly lower for the HR main effect than it was for SBP or DBP reactivity, at .23. Power of this analysis (df = 2,36; N = 19; alpha = .05) was 31%, and 81 participants would be required to increase power to 80%. There was a large effect size (.42) for MAP reactivity across the three conditions. Power of this analysis (df = 2,34; N = 18; alpha = .05) was 76%. Only 21 participants would be required to increase power to 80%.

Discussion

The overall experimental procedure worked well, as did the cardiovascular measurement and computer programme. The duration of the experiment was slightly longer than expected, but this was not considered problematic. The context of the experiment and layout of the experimental room was comfortable and adequate for the purpose of this study. Practice with the equipment and fitting the BP cuff was valuable, and the conversational nature of the talking sections became easier for the

researcher as experience was gained with different participants. The results from the pilot study replicated previous work on the general effect of talking and provided some validation of the experimental procedure. Blood pressure and HR levels were higher during talking than they were during baselines. Further, as predicted, talking about the private self elicited the greatest amount of BP reactivity, and talking about topics that were not directly focused on the self elicited the lowest amount of reactivity.

The initial accustomisation period of 7 minutes appeared long enough for participants to become used to the automatic BP cuff and for BP and HR to stabilize. The first two minutes of this time was sufficient to provide information about the study and the cuff. As the whole procedure usually took between 25 and 35 minutes, pragmatic reasons suggested that the accustomisation period remain at 7 minutes in duration, followed by a 2 minute baseline period.

The two minute rest periods were long enough for BP and HR to return to initial levels before the next baseline readings were taken. In fact, over the experiment, BP levels decreased during each subsequent baseline. This may have been due to a number of factors. The situation and/or the researcher may have become more familiar over this time, the participants may have become more accustomed to the automatic BP cuff, or their relative inactivity may account for this decrease. Therefore, the rest periods did not need to be longer in duration.

Unexpectedly, there was higher SBP, DBP and MAP during the 'spot the difference' baseline task than simply resting while baseline measurements were taken. This is not consistent with previous work, which found that a distraction task during baselines ("vanilla" baselines) elicited similar levels of BP as resting baselines. However, in this previous work the distraction task was a colour detection task on a video screen, in contrast to the 'spot the difference' task used in the present study. This task may have engaged the participants more than the colour detection task. It is also possible that the spot the difference task encouraged pressured activity to complete it in the

time that was available during the baseline and rest sections. Also, this sample was a group of psychology undergraduate and graduate students who may be used to completing and solving tasks given to them within a university setting. This is supported by the fact that most participants felt it necessary to state how many differences they had found, even though this information was not requested.

As reactivity derives its meaning from the change in cardiovascular values from baseline to task, the 'spot-the-difference' activity did not appear to be effective in obtaining baseline measurement. Rather, it appeared to function more like an additional task. Asking participants to simply sit and relax quietly elicited lower BP and HR, and therefore this instruction was retained for use in the rest and baseline periods in the main experiment.

Correlations between reactivity measures and their preceding baselines were investigated. Only four out of 12 variables were correlated with their respective baselines, three of which were HR reactivity variables. Heart rate reactivity during all three talking sections were significantly correlated with their preceding HR baselines. Of the BP measures, only DBP reactivity during public self talk was significantly correlated with its corresponding baseline. Some previous researchers have argued that baselines levels should be statistically controlled in analyses of reactivity (see Llabre et al., 1991). However, the conceptual relationship between baseline and task measures is unclear. According to Llabre et al. (1991), the variance that is predicted from baseline within task values may be meaningful variance and these authors suggest that it may be best not to partial this variance out of the analysis. Caution would suggest not partialling out baseline variance in the main analyses of reactivity. Further, in their study examining the relative value of delta and residualized change scores for cardiovascular reactivity measurement, Llabre and colleagues (1991) concluded that the magnitude of reactivity measured by delta is not necessarily dependent on its baseline value. They recommended the use of delta, or simple change scores, due to its conceptual simplicity, lack of dependence on sample characteristics, and its suitability for comparison across various tasks.

In general the language content operationalisation was successful in that it initiated different speech content over the three talking conditions, and participants viewed this content as corresponding to the separate conditions. However, three of the topics were found to be problematic. The private self topic "How stress affects you and how you feel both physically and psychologically when you are stressed" was a popular choice for participants, however the focus on stress initiated more negative talk than any other topic. Therefore this topic was a potential confound. Two public self topics were also problematic. Talking about "What you are doing/studying at University" elicited both public and private self talk consistently, and it was difficult for the researcher to influence the direction of the conversation so it remained focused on the public self. A similar problem was encountered with the topic "Movies and TV programmes that you watch, literature that you read". Therefore, these three items needed to be modified or changed for use in the main study.

Effect sizes were also determined for the main reactivity analyses, as were the statistical power levels of each test. These showed that there was a medium effect of talking condition on SBP, DBP and HR reactivity, and a large effect of talking condition on MAP reactivity. However, the power of each test showed that there was limited statistical power to reliably detect a main effect across the talking conditions if one was occurring for any of the dependent measures. Using the smallest effect size (talking condition on HR reactivity), 81 participants would be required to increase power to 80%. In summary, therefore, at least 81 participants would be required for the main study to ensure enough statistical power to detect main effects. However, including more than 81 participants in the main study would be beneficial as this study involves more complex analyses investigating moderating effects, which reduces the power of the test. Therefore, the main study aimed for a minimum of 100 participants.

Overall, the pilot study provided useful answers to practical questions regarding the experimental design and cardiovascular reactivity measurement. It also demonstrated that the speaking content manipulation was effective in eliciting varying degrss of

cardiovascular reactivity. Therefore, the main study examining self-construction processes and cardiovascular reactivity was able to proceed unhindered by these predictable and pragmatic issues.

Chapter 6
The Main Study

The main study was undertaken to empirically test hypotheses derived from a theoretical account of self-construction processes and cardiovascular reactivity. These hypotheses specified that there would be a general effect of increased cardiovascular activity during engagement in conversation, and a main effect for conversation content, such that content focused on one's private self would be related to greater cardiovascular reactivity than content focused on one's public self, which in turn would be related to greater cardiovascular reactivity than content that is not about the self.

Further, first, second and third order interactions were predicted. The differences in cardiovascular reactivity between private self, public self and non-self talk were hypothesized to depend upon a number of separate individual resources, namely private and public self-consciousness, social competence, disclosure, usual extent of conversing and usual comfort during conversations. Predicted second order interactions specified that the differences in cardiovascular reactivity across the talking conditions would depend upon social resources (the joint effect of usual comfort during conversations and social competence), linguistic resources (the joint effect of usual comfort during conversations and tendency to disclose), and conversational resources (the joint effect of usual comfort during conversations and usual extent of conversations). A third order interaction was also hypothesized regarding talking condition and stable attributes, namely private self-consciousness, public self-consciousness and social competence.

These hypotheses are outlined in detail in Chapter 4 (pages 98-100). The present chapter provides the method and results of the main study which undertook to test these hypotheses.

Method

Participants

Potential participants were given details of the study in first and second year Psychology classes, and those who were interested in taking part provided their name and telephone number. These people were contacted by phone and an appointment time was made. One hundred and two undergraduate female students at Massey University, New Zealand, served as participants. Ages ranged from 18-43, with a mean age of 21.41 (sd = 4.67).

Language Content: Topics

As in the pilot study, all participants engaged in conversation about their private self, public self and something not directly focused on the self. Five specific topics were developed to correspond to each of these three talking conditions, providing 15 topics in all. Feedback and results from the pilot study had shown that most of these topics were useful in eliciting appropriate speech content, although three were problematic. These three topics were replaced and the final list of topics is given below.

Private Self:
• Personality characteristics that you feel have changed a lot during your life or have remained the same
• Your personal goals for the next 10 years or so
• Characteristics of yourself that give you pride and satisfaction
• The habits and reactions of yours that you would like to change in an ideal world
• What you daydream and/or dream about
Public Self:
• What your hobbies are, and how you spend your spare time
• The types of recreation you take part in
• Your usual daily activities
• The type of hairstyle you have and the different types of hairstyles you have had in the past
• What sorts of clothes you wear most often

Non-Self:

• The poster of Auckland that is on the wall

• The poster of New Zealand that is on the wall

• One of the three photos provided (a photo of a balcony with a garden; a photo of a statue of a man with a fish on his head standing in a field; and a photo of a village in Spain).

Three undergraduate female students (drawn from the population of interest) independently categorised these items into the public self, private self, or non self categories using the following definitions:

Private Self: Topics which concern aspects of yourself that you observe directly. Information regarding your private self often cannot be obtained by others unless they infer it or you give this information (e.g. your emotions, moods, how you feel).

Public Self: Topics which may concern aspects of yourself that can be observed by other people. In other words, people may know information regarding your public self by having observed you (e.g. what you do, your appearance).

Non-Self: Topics that are not directly focused on the self.

The overall proportion of agreement for this classification was .91, and corrected for chance, .87 (Cohen's kappa, Fleiss, 1971). Therefore these items were retained for use in the study to provide private self, public self and non-self talk.

Each talking section was audio-recorded with a standard tape recorder and microphone for validation and transcription purposes. Time markers were provided on the tape recordings by small beeps to signal the beginning and end of each BP reading during the talking sections (the technical details of this procedure are outlined in the pilot study method section, p. 110).

To validate the talking conditions, participants were asked to read a definition (above) of the talking section they had just completed (immediately after the cessation of talk)

and rate the extent to which they thought their talk was about either their private self, public self or not about their self on a six point scale from 1 "not at all" to 6 "very much".

The number of times a participant made self-references (such as 'I', 'me', 'mine') within each talking condition was also examined to provide some validation for the language content operationalisation. This was achieved by subsequently listening to the audiotapes of each talking section for each participant and counting spoken self-references. Due to a technical fault, only 77 of the 102 participants' recordings were available.

Cardiovascular Measures

Systolic BP, DBP, HR and MAP were measured with the Critikon Dinamap 8100 portable automatic BP monitor. The Dinamap monitor was interfaced to an MS-DOS based computer and operation was controlled by computer software which started measurements at regular one minute intervals. Following each reading the cardiovascular measures, time, experimental condition and subject code were returned and stored on the computer's hard disk. The Dinamap was calibrated regularly against a standard sphygmomanometer (Trimline, PyMaH Corp.) during the running of the experiment after approximately every 25 participants. This calibration showed it was providing accurate pressure readings within 2mmHg throughout the experiment.

State Measures

State measures were included in the present study as part of a separate research project, therefore they are only briefly described here.

Arousal. Participants were asked to indicate how aroused or worked-up they felt on a 6-point scale, from not at all aroused to very aroused.

Seriousness. Participants were asked to indicate how serious or playful they felt on a 6-point scale.

127

Mood. The composed-anxious subscale of the Profile of Mood States (POMS) was used to assess positive and negative mood. This subscale contains 16 adjectives, eight of which describe a relaxed, serene state and eight which describe a tense, jittery state. Responses were obtained on a 4-point scale from 0 (much unlike this) to 3 (much like this).

Psychological Questionnaire Measures

The questionnaire asked for respondents' age and sex and also contained the following psychological measures. A copy of the questionnaire is provided in Appendix D.

Self-consciousness: Self-consciousness was measured with the Self-Consciousness Scale (Fenigstein et al., 1975), a self-report instrument containing two factorially distinct subscales that assess the extent to which individuals focus attention on the public and private aspects of the self. The private self-consciousness subscale measures one's tendency to be aware of private aspects of the self, such as attitudes, feelings, motives and values (Shaffer & Tomarelli, 1989) and consists of items such as "I reflect about myself a lot" and "I'm generally attentive to my inner feelings". The public self-consciousness subscale measures one's tendency to focus on the self-as-a-social-object and consists of items such as "I'm concerned about what other people think of me" and "I'm usually aware of my appearance". The original instrument also contains a third subscale, social anxiety, that is defined as a *reaction* to the process of public and private self-consciousness. This subscale was not analysed in the present study. Participants rate each item as to how well it describes them on a 5 point scale, from 0, not at all, to 4, very much. The private/public subscales demonstrate adequate reliability and considerable concurrent, convergent and discriminant validity (Shaffer & Tomarelli, 1989). Fenigstein et al. (1975) report test-retest correlations over two weeks for the public self-consciousness subscale of .84, and for private self-consciousness, .79.

Social competence: The Rating Scale of Social Competence (RSSC) (Lewinsohn,

Mischel, Chaplin & Barton, 1980) was employed to measure social competence. This consists of 17 adjectives (e.g. assertive, warm, attractive) which are rated on a 7-point scale. Lewinsohn et al. report that this scale has high internal consistency for self-ratings (coefficient alpha = .89 and .91, pre and post treatment for depression), and similarly for observer ratings (.95 and .97). McNamara and Hackett (1986) also report high internal consistency reliability for peer ratings (86% of the alphas were greater than .90). The internal consistency of the RSSC in the present sample was .81. This measure shows good stability over time, with a test-retest reliability of .79 over three weeks (details of this sample can be found in Lyons & Spicer, 1996, a copy of which is provided in Appendix E).

With respect to construct validity, McNamara and Hackett (1986) found no significant differences between self and peer ratings on the RSSC for both non-depressed and depressed people (although there were differences between self and observer ratings), suggesting that respondents' views of their own social competence is consistent with how others in their social group perceive it. It has also been shown to correlate .40 with the Rathus Assertiveness Scale (RAS, Rathus, 1973) and -.53 with the Social Avoidance and Distress Scale (Watson & Friend, 1969) in a young student sample (details of this sample can be found in Lyons & Spicer, 1996, Appendix E).

Self-disclosure: Jourard's 25-item Self-Disclosure Questionnaire (SDQ) was used to assess self-disclosure. This measure assesses past disclosure behaviour concerning each of 25 topics (e.g. politics, finances, sex life) to 5 target persons: mother or mother figure, father or father figure, male friend, female friend, spouse or partner. Responses are 0 - this person does not know about this topic, or only has a vague idea; or 1 - this person knows this information fully (through your telling it to them). The SDQ has an odd-even split-half reliability of .93 over all items and across four target persons, with high internal consistency for responses to particular target persons (.83-.95) (Jourard, 1971). Convergent validity for the SDQ has been demonstrated (Pederson & Higbee, 1968, cited in Hinson & Swanson, 1993), but its predictive validity for actual disclosure in a particular situation has been criticized (Cozby, 1973).

Some of the SDQ items were modified for use with New Zealand students (e.g. deleting reference to U.S. 'states'). Also, the target people 'male friend' and 'female friend' were clarified further by using 'any male friend(s)' and 'any female friend(s)', which lessened the ambiguous nature of the response to these target people. This modification was considered appropriate as the key part of the self-disclosure construct in the present work is overall *amount* of disclosure, rather than disclosure to a specific person.

Conversational Resources: At present there is no instrument available to measure the usual extent of conversing or the comfort felt during conversations. These were proposed to be the most important aspects of an individual's talking history as outlined in the theoretical framework. Therefore, a new measure was constructed for use in the present study, and its psychometric properties assessed. A paper describing the development of the Speaking Extent and Comfort Scale (SPEACS), and results of its psychometric assessment, is provided in Appendix E.

The Speaking Extent And Comfort Scale is a 20 item scale that measures the extent and comfort of people's usual conversing behaviour. It consists of two subscales containing 10 items each, and these measure the average *frequency* of conversations (including general conversations and those about the self) and how *comfortable* the respondent feels during these conversations for five target persons/groups: partner/spouse, best friend, other friends, relatives and acquaintances. While the SPEACS provides two subscales, it is not used as a total scale.

The SPEACS demonstrates reasonable internal consistency for both the extent and comfort subscales, with Cronbach's alphas of .62 and .77 respectively. These subscales also show test-retest reliabilities of .78 (extent) and .74 (comfort) over a three week period, showing that the SPEACS is reasonably stable over time (Lyons & Spicer, 1996). If the SPEACS is indexing an *average* level of conversing and comfort we would expect at least a moderate relationship between scores obtained from the same set of respondents at two points relatively close in time. As the gap in time

130

increases, there would be more opportunity for social relationships to change, such that there is more or less verbal activity or more or less comfort felt during conversations with others.

Some convergent validity data have been obtained for the SPEACS. The SPEACS subscales are expected to relate to other measures of talking behaviour. However, as noted above, there are very few of these that measure similar aspects of talking as the SPEACS. The SPEACS extent and comfort subscales both relate positively to the appraisal subscale of the Interpersonal Support Evaluation List (ISEL, Cohen & Hoberman, 1983), which measures the perceived availability of someone to talk to comfortably about one's problems (rs = .22 and .29 respectively, ps < .001). These subscales also correlate negatively with a measure of social avoidance (rs = -.20, extent, and -.34, comfort, ps < .001) (Lyons & Spicer, 1996).

Procedure

Details of the layout and location of the experiment are outlined in the pilot study method section (pages 107-108). Participants were requested to refrain from smoking cigarettes, drinking caffeine and engaging in heavy physical exercise for one hour before their appointment time. As in the pilot study, on arrival participants were shown through to the experimental room, seated and asked to read the information sheet if they had not already done so, and sign a consent form (see Appendix A for copies of these forms). The researcher placed the BP cuff on the participant's left arm. All measures were obtained with the left arm at heart level, resting on a table.

The experimental procedure began with an initial section which was seven minutes in duration, and which was followed by a further two minutes of baseline measurement. In the first two minutes, information was given regarding the study, and participants completed the state measures (which took approximately 30-60 seconds) and for the next five minutes they rested in silence to enable BP and HR to stabilize. Participants continued to rest in silence for an additional two minutes for the first baseline

measures to be taken. A within subjects design was used, such that all participants took part in all three talking conditions. These conditions were counterbalanced across participants to control for order effects. Prior to each talking section participants were given a list of topics for that section and chose one to speak about. Following each talking section participants completed a corresponding validity check and the state measures, and rested for a further four minutes, which included two minutes of rest and two minutes of baseline measurement. Each speaking section was audiotaped. This procedure is outlined below.

Initial   information/instructions given, state measures completed (2 minutes)
            quiet rest (5 minutes)
Baseline   quiet rest (2 minutes)

For each talking condition:
Choice   instructions given, participant chooses a specific topic (up to 1 minute)
Talk   participant speaks about the topic chosen (2-5 minutes)
Rest   validation and state measures completed (30-60 seconds)
            quiet rest (2 minutes)
Baseline   quiet rest (2 minutes)

The overall experimental procedure took approximately 30 to 35 minutes to complete. Standardized instructions were given for the initial, rest and choice sections. These are described in detail in Appendix B. All participants were asked to look at the pictures on the walls during the rest periods. Following the experimental procedure participants were shown to another room and asked to complete the questionnaire which took approximately 20 minutes.

Results

Cardiovascular Variables

As in the pilot study, cardiovascular data was collected at one minute intervals throughout the experimental procedure for SBP, DBP, HR and MAP. Means for each cardiovascular measure were calculated for each of the experimental sections, providing each participant with a mean score for each of these sections. All baseline sections were collapsed together to provide an overall baseline variable, as were the talking condition sections. Reactivity variables for each talking section were also created for all four cardiovascular measures in the same way as in the pilot study, using change from mean baseline score (prior to the particular talking section) to mean talking condition score.

The cardiovascular variables were examined for missing values and normality of distributions. All of the fourth baseline variables (for SBP, DBP, HR and MAP) had two missing cases due to two participants who had to leave the experiment early. Consequently, these two cases were also missing on the overall baseline variables. Four variables were identified with outliers which were four or more standard deviations from the mean (SBP during first baseline, HR during public self talk, SBP baseline preceding public self talk and DBP reactivity during private self talk), and these cases were deleted from relevant analyses. One participant completed the experimental procedure with her little brother present. This created a different social context in which the cardiovascular data were obtained for this participant and therefore these data were not included in any cardiovascular analysis. All of the cardiovascular variables were normally distributed.

Psychological, Age, Self-Reference and State Variables

These variables were all screened for accuracy of data entry, missing cases and normality of distributions. Data obtained from the questionnaire measures were

recoded as appropriate and summed to provide total scale and subscale scores. The private and public self consciousness scales and the social competence variable had either one or two missing cases. The disclosure subscale variables (disclosure to mother, father, male friend, female friend, partner) all had a number of missing cases, ranging from eight (female friend) to 43 (partner), while the mean overall disclosure variable had eight missing cases. Eleven state (including validation) variables also had one or two cases missing. Due to a technical fault, only 77 of the 102 participants' recordings were available to examine the number of self-references made in each talking condition, therefore there were 25 missing cases on the self-reference variables. None of the psychological, age, self-reference or state variables had outliers which were four or more standard deviations from the mean, and all these variables, except age, met univariate normality of distribution assumptions. Age was slightly positively skewed, however this was not considered severe enough to warrant transformation of this variable.

Validation of Language Content Manipulation

Immediately following each talking section, participants read a definition of either private self, public self or non-self talk and rated the extent to which they thought their talk was about that particular section on a six point scale, from 1 (not at all) to 6 (very much). The mean rating for public self talk was 5.06 (sd = 0.93, n = 100) and for private self talk, 5.07 (sd = 0.83, n = 101). Following the non-self section participants rated the extent to which their talk was directly focused on themselves. The mean response for this rating was 1.96 (sd = 1.22, n = 100).

The number of self references made by a participant in a talking condition also differed according to the particular condition. In the public self section, participants spoke a mean of 27.79 self reference words (sd = 10.80, n = 76), while in the private self section, a mean of 36.97 self references were made (sd = 14.01, n = 77). In the non-self section, the average number of self references was 6.49 (sd = 5.57, n = 76). The number of self references spoken across conditions were significantly different

Table 6.1: Correlations, Means and Standard Deviations Among Psychological and Age Variables

	Conversation Extent	Conversation Comfort	Disclosure[a]	Private Self-Cons.[b]	Public Self-Cons.	Social Competence	Mean	Standard Deviation
Age	-.27**	-.00	-.18	-.02	-.26**	-.19	21.41	4.67
Conversation Extent	-	.10	.19	-.12	-.05	.15	27.43	5.83
Conversation Comfort		-	.22	-.13	-.29**	.48***	5.42	0.73
Disclosure			-	.12	.05	.21*	13.24	3.55
Private Self-Cons.				-	.41***	-.03	22.80	5.69
Public Self-Cons.					-	-.12	17.01	5.08

* p < .05 ** p < .01 *** p < .001
[a] Correlations with Disclosure are based on 93/94 cases, otherwise Ns range from 99-102 due to missing data
[b] self-cons. = self-consciousness

(F (2,144) = 192, p < .001) and unlikely to be due to the length of the different talking conditions, as the mean number of readings taken during each section ranged from 3.04 (non-self) to 3.41 (private self).

In each talking condition participants could choose to speak about one topic from a list of five. Three further variables were created to correspond to the topic chosen in each talking section. Between-subjects ANOVAs were carried out on these variables to ensure that cardiovascular levels and cardiovascular reactivity did not differ across topics within a talking condition. No differences across the five topics in any talking condition were found.

Relationships Among and Between Psychological and Age Variables With Cardiovascular Variables

To help with the interpretation of subsequent analyses, relationships among the psychological and age variables were examined and are displayed in Table 6.1. Unexpectedly, the SPEACS extent and comfort variables (usual extent of conversations / usual comfort felt during conversations) were not related. Interestingly, usual extent of conversations had a weak, negative relationship with age, as well as with public self-consciousness. Usual comfort felt during conversations correlated negatively with both private and public self-consciousness, and had a moderate, positive relationship with social competence.

The public and private self-consciousness variables were moderately correlated with one another, consistent with previous findings (Fenigstein et al., 1975). Public self-consciousness was also negatively related to age. Social competence reassuringly related in the expected directions with disclosure and the SPEACS variables.

Relationships between age, psychological variables and resting cardiovascular levels (using baseline one) were examined. Only one significant relationship was found, a weak, positive correlation between extent of talking and SBP. A table displaying

Table 6.2: Means and Standard Deviations for Cardiovascular Levels Across Individual Baselines and Overall Baseline and Talking Sections

Cardiovascular Measure		Baselines				Overall	
		1	2	3	4	Baseline	Talking
N		101	101	101	99	99	101
SBP	*M*	119.20	118.91	117.18	117.05	118.06	126.05
	sd	9.47	7.93	8.52	8.66	8.09	9.55
DBP	*M*	61.00	57.99	55.57	55.06	57.40	67.15
	sd	7.57	7.83	7.28	7.49	6.82	8.46
HR	*M*	74.46	73.99	73.17	73.13	73.54	82.49
	sd	11.53	11.25	10.20	10.00	10.33	10.26
MAP	*M*	83.19	82.88	81.51	82.24	82.42	91.80
	sd	7.70	7.24	7.10	7.82	6.76	8.07

correlations between all psychological, age and resting cardiovascular variables is provided in Appendix F.

Relationships between the psychological variables, age and cardiovascular reactivity were also examined, and they too are displayed in Appendix F. Only three correlations were statistically significant. Usual comfort felt during conversations correlated positively with DBP and MAP reactivity during public self talk (rs = .22 and .27, ps < .05 and .01, respectively). Public self-consciousness had a weak, negative relationship with DBP reactivity during non-self talk (r = -.21, p < .05).

Differences in Cardiovascular Levels Across Talking and Baseline Sections

Although the main focus of the main study is on cardiovascular reactivity, cardiovascular levels were examined to provide an overview of the cardiovascular system throughout the experimental procedure. Individual baselines were examined to ensure the rest periods were effective in reducing BP and HR, as were overall baseline and talking sections to ensure the talking versus baseline manipulation was effective. Table 6.2 shows the means and standard deviations for individual baselines and for overall baseline and talking section variables. Paired t-tests were used to investigate differences between overall baseline and overall talking cardiovascular levels. All cardiovascular levels were found to be significantly higher during talking than they were during baseline (ts ranged from 19.08 to 23.56, all significant at p < .001).

Cardiovascular levels within the three separate talking conditions were also examined. Table 6.3 shows the mean level of each cardiovascular measure across the three talking conditions. All cardiovascular levels were lowest during the non-self talking condition. SBP, DBP and MAP levels were highest during private self talk, while HR was slightly higher during public self than private self talk. Repeated measures ANOVAs were used to examine differences in these mean cardiovascular levels and results for these analyses are also shown in Table 6.3. Systolic BP, DBP, HR and

Table 6.3: Omnibus and Simple Contrast Univariate F-Values, Means and Standard Deviations for SBP, DBP, HR and MAP Levels Across Talking Conditions

Cardiovascular Measure		Talking Conditions			N	Omnibus Tests		Simple Contrasts Between Conditions			df
		Private Self	Public Self	Non Self		F-value	df	Private/Public F-Value	Private/Non F-Value	Public/Non F-Value	
SBP	M	127.39	125.82	124.94	101	7.88***	2/200	7.30**	15.18***	1.76	1/100
	sd	10.88	10.31	9.40							
DBP	M	68.63	66.70	66.10	101	6.40**	2/200	7.10**	9.87**	0.78	1/100
	sd	9.84	9.42	9.17							
HR	M	83.42	83.54	81.73	100	8.29***	2/198	0.06	9.37**	16.49***	1/99
	sd	10.52	9.33	9.78							
MAP	M	93.23	91.25	90.91	101	6.96***	2/200	8.47**	11.77***	0.27	1/100
	sd	9.11	8.79	8.96							

** $p < .01$ *** $p < .001$

MAP were all significantly different across the three talking conditions.

Specific comparisons between the talking conditions using MANOVA (see p. 113 in the pilot study for an outline of this procedure) revealed that there were significant differences between private self and public self talk for SBP, DBP and MAP, as shown in Table 6.3. There were no significant differences between public self and non-self talk for these cardiovascular measures. A different pattern of results was observed for HR, which was significantly different across private and non-self, as well as public and non-self talking conditions, but not across private and public self talking conditions.

Differences in Cardiovascular Reactivity Across Talking Conditions

Separate repeated measures ANOVAs were carried out to assess whether reactivity differed across the three talking conditions for each cardiovascular measure. The means, standard deviations and F-values for these analyses are displayed in Table 6.4. There were significant differences in each of the cardiovascular reactivity measures across the three talking conditions. Means show that private self talk elicited the highest SBP, DBP and MAP reactivity, whereas public self talk elicited the highest HR reactivity. Cardiovascular reactivity was lowest during non-self talk.

Specific comparisons between the talking conditions using simple contrasts in MANOVA show a different pattern of results to the cardiovascular level results, as can be seen in Table 6.4. As predicted, all the cardiovascular reactivity measures were significantly greater during private self talk than they were during non-self talk. However, only two measures, SBP and HR reactivity, were significantly different between public self talk and non-self talk. Further, the only difference in reactivity between private self and public self talk was observed in DBP.

Table 6.4: Omnibus and Simple Contrast Univariate F-Values, Means and Standard Deviations for SBP, DBP, HR and MAP Reactivity Across Talking Conditions

Cardiovascular Reactivity		Talking Condition			N	Omnibus Tests		Simple Contrasts Between Conditions			df
		Private Self	Public Self	Non Self		F-value	df	Private/Public F-Value	Private/Non F-Value	Public/Non F-Value	
ΔSBP	M	8.86	8.03	5.98	101	7.98***	2/200	1.32	13.97***	7.95**	1/100
	sd	6.17	5.74	5.36							
ΔDBP	M	9.90	8.49	8.11	100	3.64*	2/198	4.60*	6.14*	0.29	1/99
	sd	5.65	5.59	6.18							
ΔHR	M	8.78	9.86	7.23	101	10.40***	2/200	3.39	6.35*	24.18***	1/100
	sd	6.03	5.66	5.70							
ΔMAP	M	10.52	9.36	7.94	101	6.07**	2/200	2.12	16.02***	3.36	1/100
	sd	6.37	6.85	5.73							

* $p < .05$ ** $p < .01$ *** $p < .001$

Interaction Effects Between Talking Condition and Psychological Variables on Cardiovascular Reactivity

Analytic Strategy

The previous set of results shows a main effect for talking condition on SBP, DBP, HR and MAP reactivity. The following set of analyses examined whether talking condition interacted with any psychological variable, or certain combinations of psychological variables, to affect cardiovascular reactivity. In other words, these analyses investigated whether the differences in reactivity across the talking conditions changed according to the level of any psychological variable. Four types of MANOVAs were conducted to test for linear and non-linear interactions, as well as higher-order linear and higher-order non-linear interactions.

To test for linear interactions, the psychological variables were all entered separately as continuous covariates into the main effect analyses for talking condition. Again, the dependent variables were transformed into simple contrasts. This analysis thus provided a within cells regression effect of the psychological variable, as the covariate, onto differences in reactivity across the talking conditions. In this way the multivariate test of the regression effect constituted a test of the interaction between the psychological variable and talking condition. This effectively tested whether the impact of the psychological variable was different across the three talking conditions (i.e. whether the slopes differed), and the dependent variable became the *differences* in reactivity across conditions.[1] To investigate hypothesized curvilinear interactions, each psychological variable was squared and entered as an additional covariate into the model, which already contained the original variable. Entering both the original

---

[1] No hypotheses were posited regarding the effects of the psychological variables on cardiovascular reactivity *within* any given talking condition, primarily because they did not fall neatly out of the present theoretical framework. Nevertheless, the effects of each psychological variable on cardiovascular reactivity during each talking condition were examined using simple regression analyses. Of the 72 analyses undertaken, one result was significant at the .01 level: usual comfort during conversations had a significant impact on MAP reactivity during public self talk ($R = .27$; $B = .27$).

and the squared variable permits quadratic relationships to be examined (Jaccard, Turrisi & Wan, 1990).

It was also hypothesized that particular combinations of psychological variables would interact with talking condition to influence cardiovascular reactivity. To examine this, the deviation score product terms of the relevant psychological variables were calculated and a new variable created (Jaccard et al., 1990). The relevant psychological variables were then entered into the analysis simultaneously, along with the newly created product term variable. In this way the joint effect of two variables could be examined while controlling for their individual main effects. Higher-order curvilinear interactions were tested for in the same way as lower-order interactions, by squaring the product-term variable and entering it into the model with its original variable and the two original psychological variables. Examples of the SPSS/PC commands used to investigate linear and curvilinear interaction effects in the present design are provided in Appendix C.

Where a linear interaction effect did occur between a psychological variable and the talking conditions, separate regression analyses were then carried out to examine the nature of the effect. By regressing the psychological variable onto the dependent reactivity measure during each separate talking condition and plotting each regression slope, the difference in the impact of the psychological variable across conditions could be seen. Statistically significant curvilinear interaction effects were examined in the same manner, although the original variable was entered on Step 1 in the multiple regression analysis, and the square of that variable entered on Step 2. These multiple regression analyses were 'multiple' in the sense that although there was only one independent variable involved, this variable was in two statistical forms, namely linear and quadratic.

Lower-Order Interaction Analyses

Linear and curvilinear interactions between each psychological variable and talking

condition on each cardiovascular reactivity measure were examined. Results for all these analyses are provided in Appendix E. In cases where both the linear and the curvilinear interactions were statistically significant, the curvilinear interaction results were used as these show a more complex relationship that may include a linear component. As mentioned, for each significant interaction that was found, multiple regression analyses were carried out to examine the nature of the effect. Results from the relevant multiple regression analyses (R^2, R^2 Change and Bs) carried out are presented in Appendix G.

No significant linear interactions were found, although there were three significant curvilinear interactions. Usual extent of conversations interacted with talking condition to affect DBP reactivity (Wilks' approximate $F(4,192) = 2.53$, $p < .05$), while usual comfort felt during conversations and talking condition interacted to affect MAP reactivity (Wilks' approximate $F(4,194) = 2.93$, $p < .05$)[2].

Simple contrasts revealed that usual extent of conversations affected the difference in DBP reactivity between public and private talk ($F(2,97) = 8.52$, $p < .001$), as well as public and non-self talk ($F(2,97) = 3.66$, $p < .05$). To examine the nature of this curvilinear effect, three multiple regressions were carried out using the usual extent of conversations as the independent variable, and the three reactivity variables (DBP reactivity during private, public and non-self talk) as the dependent variables. The extent of conversations variable was entered on Step 1, and the square of this variable

---

[2]   As the extent and comfort of conversations variables included replies to questions regarding general and 'self' conversations, further interaction analyses were carried out to investigate whether there were differential effects of type of conversations by talking condition on reactivity. Thus, four variables were created and used for these analyses: extent of general conversations, extent of self conversations, comfort of general conversations and comfort of self conversations. Results mirrored the results obtained with the combined variables. No significant linear interactions were found, while extent of general conversations and extent of self conversations both had curvilinear interactions with talking conditions on DBP reactivity. Further, there was a significant curvilinear interaction between comfort felt during general conversations and condition on MAP reactivity, while the interaction between comfort felt during self conversations and condition on MAP reactivity approached significance. As these subscales were not psychometrically strong (internal reliabilities using Cronbach's alphas ranged from .14 to .52), and do not produce any differential effects, the combined subscales are used and reported on.

140
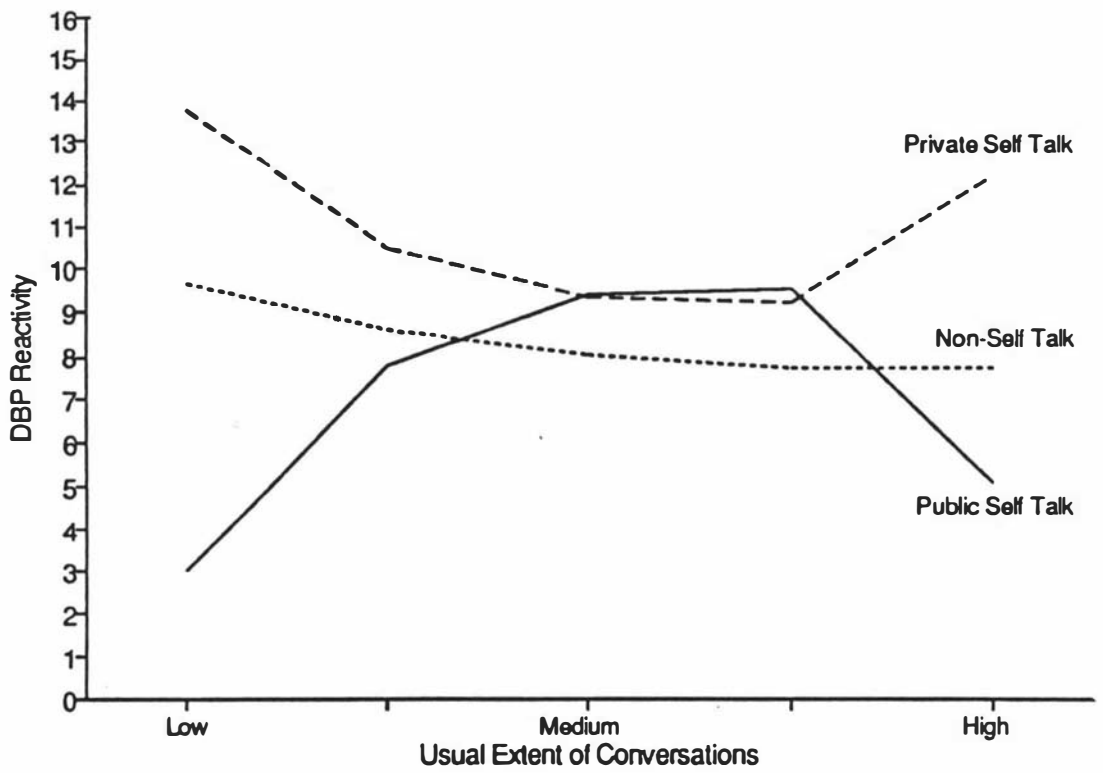
Figure 1: Regression Slopes Displaying the Impact of Usual Extent of Conversations on DBP Reactivity During Three Kinds of Talk

Figure 2: Regression Slopes Displaying the Impact of Usual Comfort Felt during Conversations on MAP Reactivity During Three Kinds of Talk

entered on Step 2, so any curvilinear impact of extent of talking on DBP during each talking condition could be examined. Results of these analyses are presented in Appendix H. As with all observed curvilinear interaction effects, the regression slopes were examined by plotting the predicted reactivity score based of the following range of independent variable scores: the lowest, one standard deviation below the mean, the mean, one standard deviation above the mean and the highest. This approach allows the shape of the relationship to emerge. Figure 1 shows the regression slopes of usual extent of conversations on DBP reactivity in each talking condition. Usual extent of conversations had opposite effects on DBP reactivity during public and private self talk. People who do not engage in many conversations had low DBP reactivity during public self talk, but high reactivity during private self talk. The same pattern holds for people who engage in a lot of conversations, although people who report engaging in a medium amount of conversations had similar reactivity levels across these two conditions. This impact of usual extent of talking on DBP reactivity during public self talk was significantly different than its impact during non-self talk, where little effect was observed.

Usual comfort felt during conversations also interacted with talking condition to affect MAP reactivity, however the difference occurred between the private and non-self talking conditions (F (2,98) = 3.74, $p < .05$). Regressions were carried out as before using MAP reactivity during either private, public or non-self talk as the dependent variable, and the regression slopes are displayed in Figure 2 (results of these regression analyses are provided in Appendix H). During private self talk, MAP reactivity was highest among those who reported feeling a medium usual level of comfort during conversations. This effect was reversed during non-self talk, when these people displayed the lowest MAP reactivity. During public self talk MAP reactivity was lowest among people who reported feeling low levels of comfort during conversations and highest among people who reported feeling high usual comfort levels during conversations.

Higher-Order Interaction Analyses

The interaction effects of combinations of psychological variables with talking condition on cardiovascular reactivity were also investigated. It was hypothesized that stable attributes (self-consciousness X social competence), social resources (usual comfort of talk X social competence), conversational resources (usual extent X usual comfort of conversations) and linguistic resources (usual comfort of conversations X disclosure) would moderate the difference in reactivity across different talking conditions. Both linear and curvilinear interactions were investigated and the results for all these analyses are displayed in Table G.2 in Appendix G.

One significant three-way linear interaction was found between usual extent of conversations, usual comfort felt during conversations and talking condition on MAP reactivity (Wilks' approximate F (2,98) = 3.31, p < .05). Simple contrasts revealed that the difference in MAP reactivity across the private and public self talking conditions, as well as the public and non-self conditions, depended on both the usual extent of conversations and the usual comfort felt during these conversations (Fs (1,99) = 6.37 and 4.26, respectively, ps < .05). To examine the nature of this interaction, the extent of talking variable was trichotomised into low, medium and high groups (ns = 33, 33, and 36, respectively). The impact of usual comfort felt during conversations on MAP reactivity during each of the three talking conditions was then examined at the three levels of the extent variable. Results from these regression analyses are presented in Appendix H. The regression slopes were plotted based on the predicted MAP reactivity score from the lowest and highest usual comfort scores in each group, and are displayed in Figures 3-5.

Figure 3 shows the impact of usual comfort felt during conversations on MAP reactivity across the three talking conditions for people who do not generally converse much. Among these people, the amount of comfort they usually feel when conversing did not appear to effect MAP reactivity during non-self talk, but it did effect MAP reactivity during both private and public self talk. During public self talk, people who

Figure 3: Regression Slopes Displaying the Impact of Usual Comfort Felt during Conversations on MAP Reactivity During Three Kinds of Talk Among People with Low Levels of Conversation Extent

Figure 4: Regression Slopes Displaying the Impact of Usual Comfort Felt during Conversations on MAP Reactivity During Three Kinds of Talk Among People with Medium Levels of Conversation Extent

usually feel comfortable during conversations displayed more MAP reactivity than those who did not usually feel comfortable during conversations. However, when talking about their private self, those who usually felt more comfortable during conversations displayed less MAP reactivity than those who did not usually feel comfortable during conversations.

Figure 4 displays the impact of usual comfort felt during conversations on MAP reactivity between talking conditions for people who engage in a medium amount of conversations. In all conditions usual comfort felt during conversations had a positive impact on MAP reactivity, such that those who usually felt more comfortable had higher MAP reactivity than others. This effect was strongest in the public self talking condition. In contrast, there was a reduced impact of comfort felt during conversations on MAP reactivity during the three conditions for people who usually engage in a lot of conversations, as shown in Figure 5. For these people, usual comfort felt during conversations had a slight positive impact on MAP reactivity during public self talk, but no impact during private self talk and a slight negative impact during non-self talk.
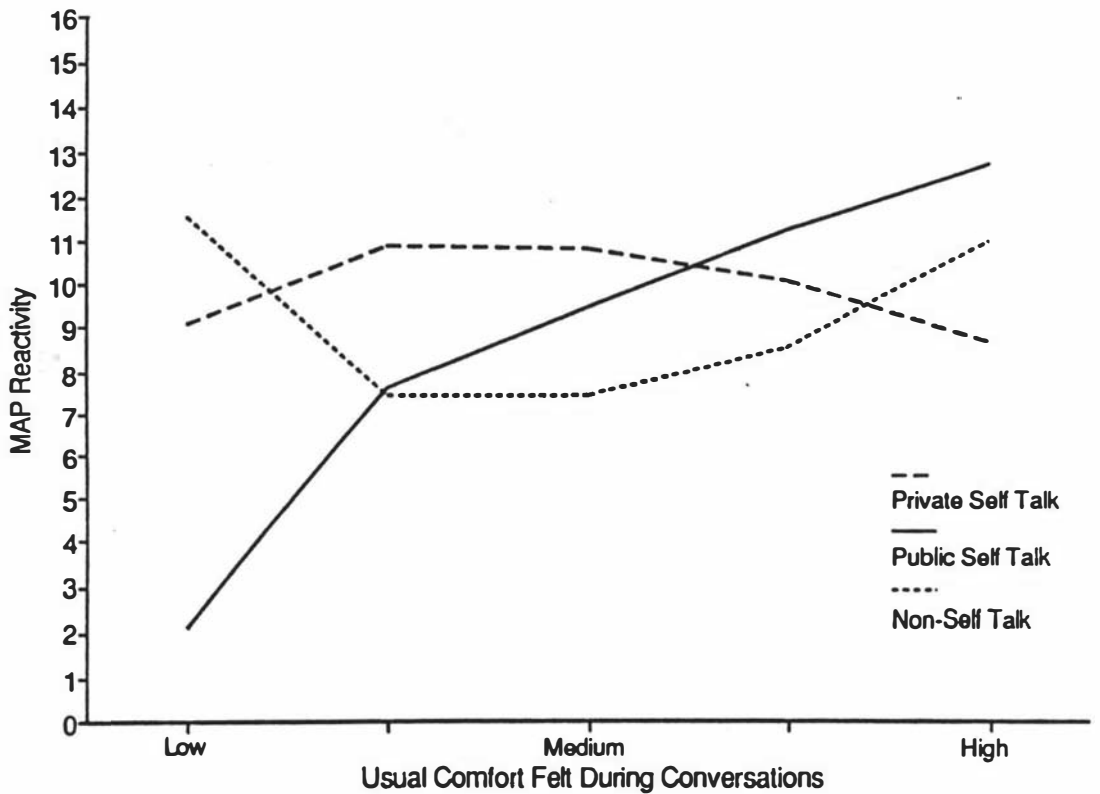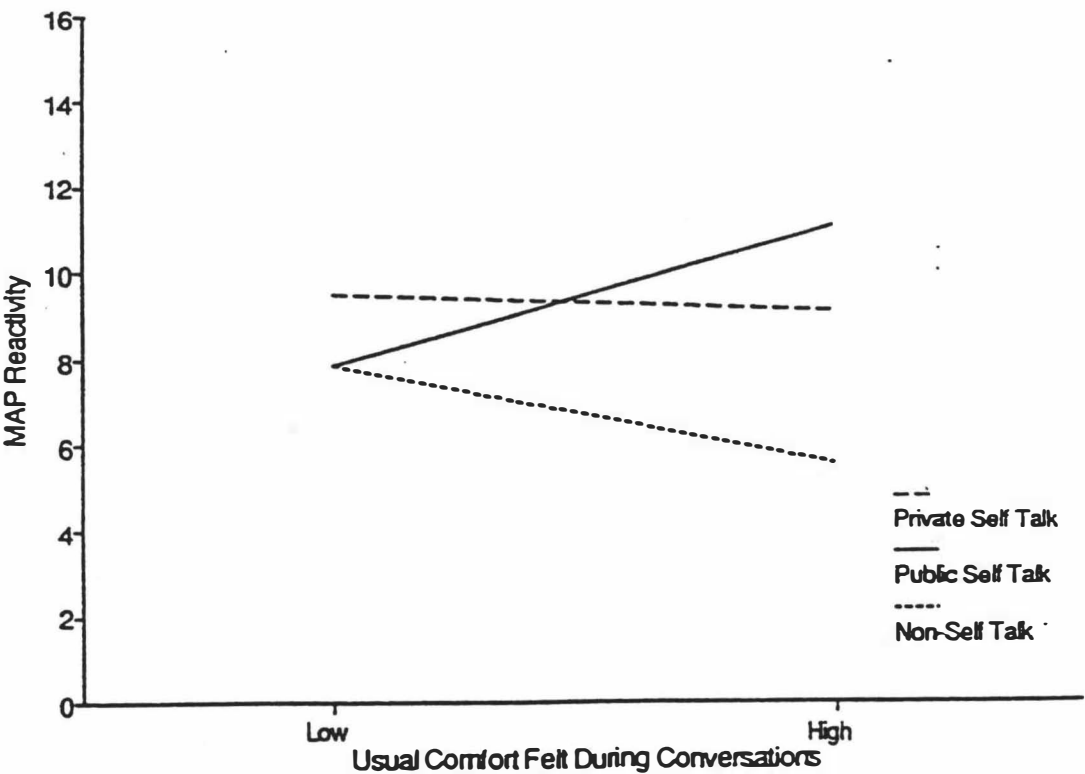

Figure 5: **Regression Slopes Displaying the Impact of Usual Comfort Felt during Conversations on MAP Reactivity During Three Kinds of Talk Among People with High Levels of Conversation Extent** 143

One significant three-way curvilinear interaction was also found with conversational resources. Usual extent of conversations, usual comfort felt during conversations and talking condition interacted to affect DBP reactivity (Wilks' approximate F (4,192) = 4.18, $p < .01$). As before, simple contrasts showed that this was due to the difference in DBP reactivity between public and private self talk, as well as public and non-self talk (Fs (2,97) = 4.71 and 7.08; ps < .01 and .001, respectively). In the same manner as before, this interaction was examined using the trichotomised extent of conversations variable. The impact of usual comfort felt during conversations on DBP reactivity during each of the three talking conditions was examined at each level of the extent variable, and the results provided in Appendix H. As the interaction effect was curvilinear, the regression slopes were plotted using the predicted DBP reactivity scores based on the lowest, mean and highest usual comfort during conversations scores in each group. These regression slopes are displayed in Figures 6-8.

Figure 6 shows the effect of usual comfort felt during conversations on DBP reactivity across the talking conditions for those people who do not usually engage in many conversations. Among these people, usual comfort had a curvilinear impact on DBP reactivity during public self talk, such that those with low or high usual felt comfort levels had higher reactivity than those with medium felt comfort levels. However, during non-self talk, usual comfort had a negative impact on reactivity up to a certain point, when it no longer affected reactivity. Those people with low levels of usual comfort felt during conversations had higher reactivity during non-self talk than those with either medium or high comfort levels. Usual felt comfort did not impact on DBP reactivity during private self talk.

In comparison, usual comfort felt during conversations impacted differently on DBP reactivity among people who engage in a medium amount of conversations, as can be seen in Figure 7. Usual comfort had a positive, linear impact on DBP reactivity during public self talk, such that people who usually feel very comfortable during conversations displayed higher reactivity than people who felt medium levels of comfort, who in turn displayed higher reactivity than those who usually feel low levels
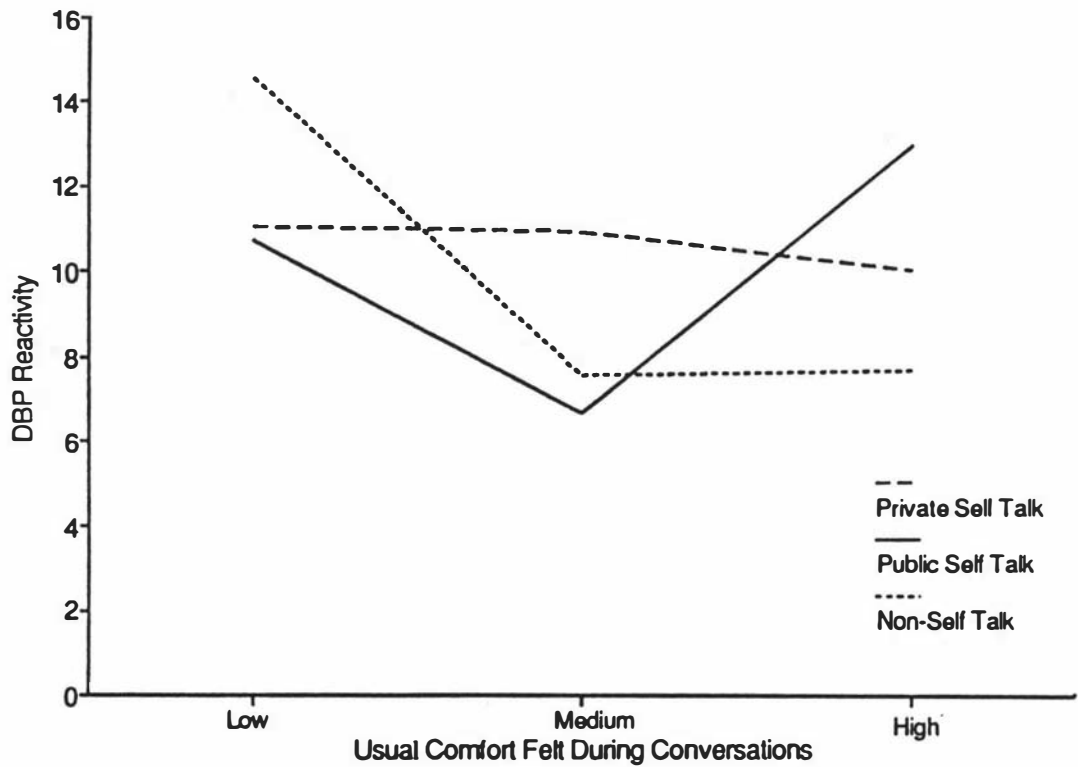
Figure 6: Regression Slopes Displaying the Impact of Usual Comfort Felt during Conversations on DBP Reactivity During Three Kinds of Talk Among People with Low Levels of Conversation Extent
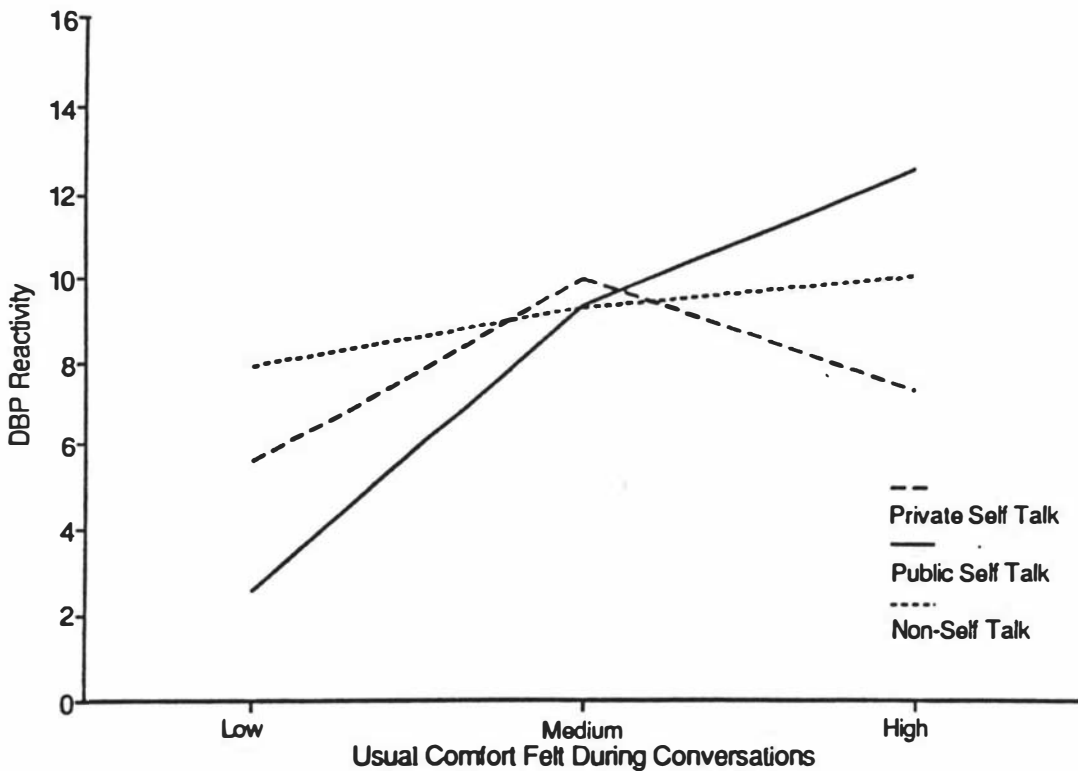
Figure 7: Regression Slopes Displaying the Impact of Usual Comfort Felt during Conversations on DBP Reactivity During Three Kinds of Talk Among People with Medium Levels of Conversation Extent

of comfort. There was little impact of usual comfort on reactivity during non-self talk, but during private self talk reactivity was highest among those who usually feel a medium amount of comfort during conversations.

Finally, Figure 8 displays the difference in impact of usual felt comfort on DBP reactivity between talking conditions among people who report engaging in many conversations. Again, usual comfort had a curvilinear effect on reactivity during public self talk, however this was in the reverse direction than found among people who do not engage in many conversations. People who do converse a lot, but who do not usually feel comfortable doing so, displayed much lower reactivity during public self talk than people who converse a lot, but feel medium levels of comfort during conversations. People who converse a lot and who feel very comfortable doing so also displayed lower reactivity than those who feel medium levels of comfort. During private self talk, usual comfort had a linear impact on DBP reactivity, such that the more usual comfort reported, the higher the reactivity that was displayed. During non-self talk, however, people who usually felt medium levels of comfort had lower reactivity than those who felt either low or high levels of comfort during conversations.
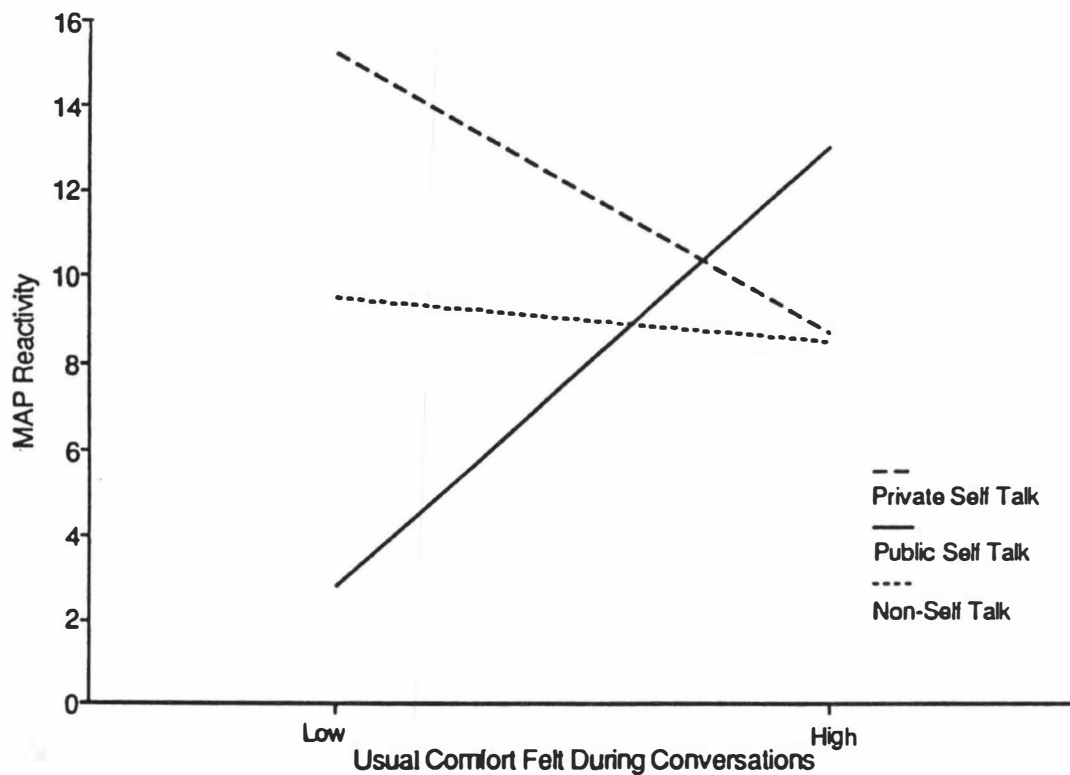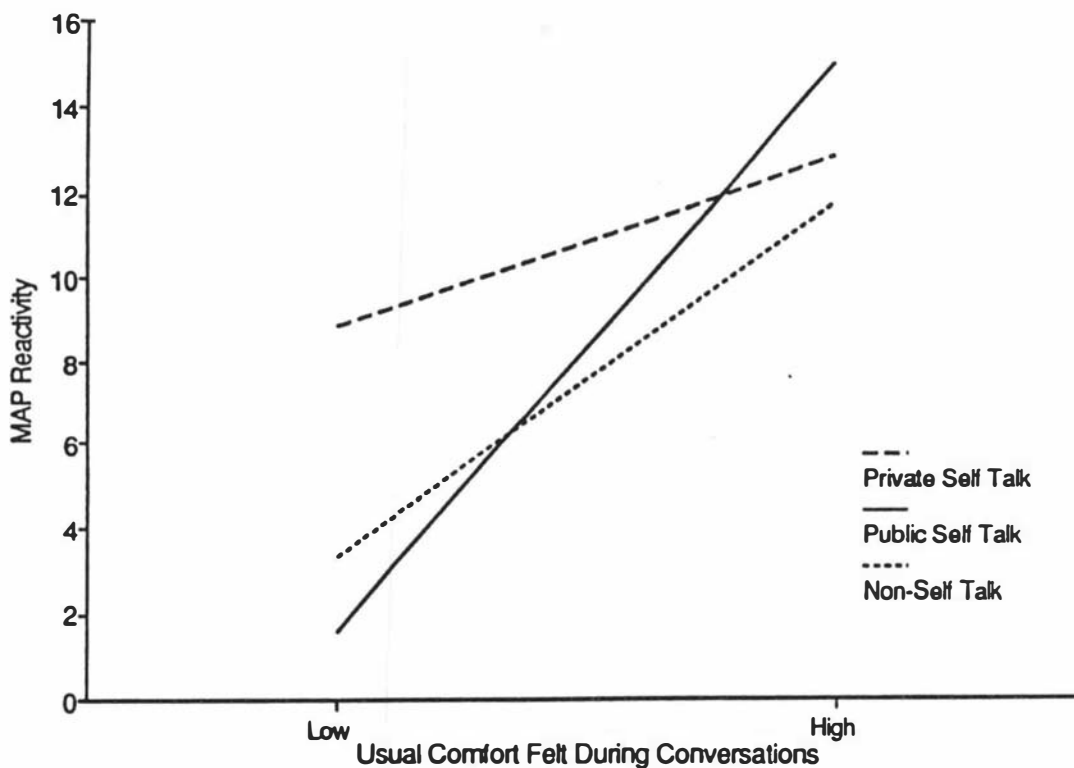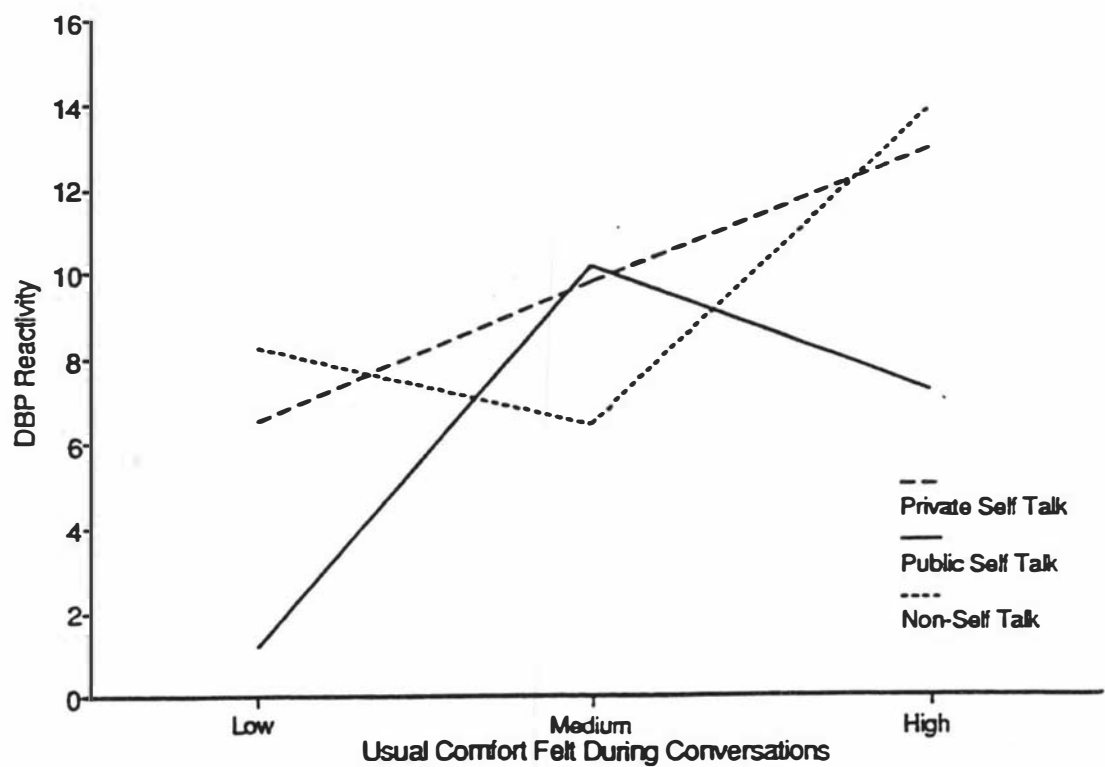

Figure 8: Regression Slopes Displaying the Impact of Usual Comfort Felt during Conversations on DBP Reactivity During Three Kinds of Talk Among People with High Levels of Conversation Extent

145

In summary, two of the six first order interaction hypotheses were supported. Two significant curvilinear interactions were found with individual psychological variables and talking condition, one of which affected DBP reactivity (usual extent of conversations) and one which affected MAP reactivity (usual comfort felt during conversations). Of the higher-order interaction analyses, one of the three predicted second order interactions was also supported across two different cardiovascular reactivity measures (while the hypothesized third order interaction effect was not). These two significant effects involved 'conversational resources', or the combination of usual extent of conversations with usual comfort felt during conversations. There was a linear interaction between conversational resources and talking condition on MAP reactivity, and a curvilinear interaction between conversational resources and talking condition on DBP reactivity. For the majority of these interactions, simple contrasts revealed that the differences were occurring between the public and private self talking conditions, as well as the public and non-self talking conditions, contrary to predictions.

Chapter 7

Discussion: Conversation Content,
Conversational Resources and Cardiovascular Reactivity

Human beings, unlike other living creatures, live in bodies that speak and communicate with every fibre and cell. Humans do not speak extra-corporally, but rather in and through their bodies (Lynch & Rosch, 1990)

Consistent with previous research (e.g. Lynch et al., 1980), this study found that levels of SBP, DBP, HR and MAP were significantly higher while the women participants were talking than while they were resting. As predicted, engaging participants in a conversation elicited cardiovascular reactivity. Further, all four cardiovascular measures demonstrated significant differences in reactivity across the three experimental talking conditions. The highest BP reactivity was observed while participants engaged in a conversation that focused on aspects of their private self, such as thoughts, feelings and emotions, and the lowest was observed during a conversation that was not specifically focused on the self. While BP was most reactive during a conversation that focused on the private self, HR was most reactive while participants engaged in a conversation about aspects of their public self, and least reactive during talk that was not focused on the self.

Conversation Content

Conversational content that was central to the self was associated with greater reactivity than content that was not focused on the self. All cardiovascular reactivity measures were higher during conversation that focused on private aspects of the self than they were during conversation that was not directly focused on the self. The distinctions between cardiovascular reactivity during conversations about public aspects of the self with the other conversations were not so clear, and differed for the

147

various cardiovascular measures. Results with SBP and HR reactivity were straightforward: their differences across the three kinds of conversations were not affected by any of the psychological variables examined in the study. However, results with DBP and MAP reactivity were more complex. Their differences across the talking conditions depended on the individual's conversational resources as indexed by the SPEACS - their usual extent and comfort of conversations.

Private Versus Public Self Talk

Due to the importance placed on private self information in our culture, it was predicted that private self talk would be more constructive for a sense of self than would public self talk, and that this difference would be displayed in greater cardiovascular reactivity. However, this hypothesis was not fully supported. Heart rate reactivity was actually higher during public self talk, although this difference was not statistically significant. Systolic BP during private self conversations was higher than that observed during public self conversations, although this difference was also not statistically significant. These findings were irrespective of the types of resources the individual brought to the situation. Similarly, there was no main effect for MAP reactivity across private self and public self talk, however differences in MAP reactivity across these two types of conversation were apparent when the participants' conversational resources were taken into consideration, namely the extent to which they tend to take part in conversations and the comfort they feel during conversations. Diastolic BP was the only cardiovascular measure that displayed significantly greater reactivity during private self talk than during public self talk. The nature of this difference, however, also depended on the conversational resources women brought into the talking situation.

It seems that although private information about the self is credited with more emphasis in our culture (Andersen, 1987), talking about such information does not elicit greater cardiovascular reactivity than does talking about public information about the self. Further, a conversation focusing on private aspects of the self may be

148

expected to elicit a greater focus on the self than one about public aspects of the self. The amount participants self-referenced during these two talking conditions was consistent with these expectations. On average, participants used significantly more self-references during private self talk than they did during public self talk. So while private self talk may have elicited greater self-focus among participants than public self talk, this was not reflected in cardiovascular reactivity. If the current self-construction account of cardiovascular reactivity is correct, it would suggest that engaging in conversations about the public self is just as salient for constructing a sense of self as is engaging in conversations about the private self. However, it may be that this theoretical account is incorrect.

Self Versus Non-Self Talk

It was also hypothesized that engaging in a conversation that was not specifically focused on the self would not be as constructive for a sense of self, and would therefore be associated with less cardiovascular reactivity, than talking about either private or public aspects of the self. This was supported for both SBP and HR reactivity. Both these cardiovascular reactivity measures were significantly higher during private and public self talk than during non-self talk. Diastolic BP and MAP were also more reactive during private self talk than during non-self talk, but no differences were observed in these measures between talk regarding the public self talk and talk that was not about the self. Surprisingly, these results reversed when an individual's conversational resources were taken into consideration: the difference observed in DBP and MAP reactivity across the private self and non-self talking conditions disappeared, while a difference between public self and non-self talk emerged. Thus, conversational resources affected the differences in DBP and MAP reactivity across public self and private self talk, as well as public self and non-self talk. It is to the individual resources that we now turn.

Individual Resources

Particular individual resources were expected to influence the self-construction processes that occur during certain kinds of talk, both separately and in specific combinations. These resources were therefore predicted to influence differences in cardiovascular reactivity across private, public and non-self talk. However, with the exceptions of usual extent and comfort of conversations, none of these resources were found to interact with talking content to affect cardiovascular reactivity.

Two first order interactions were found. The differences in DBP reactivity across private self, public self and non-self talk depended on the extent to which individuals usually engaged in conversations. Also, the differences in MAP reactivity across the three talking conditions depended on the usual comfort individuals feel when they engage in conversations. However, both of these results were more complex than they appeared, for both were embedded in second order interactions involving conversational resources, namely the combined effect of usual extent and comfort of conversations. Diastolic BP and MAP displayed differences in reactivity across the three talking conditions, however the nature of these differences, and where they specifically occurred, depended on the joint effect of usual extent and comfort of conversations. In discussing these results, the second order interactions are given priority for they describe the most precise way in which the variables jointly affect cardiovascular reactivity, and therefore what may be occurring with self-construction processes.

Conversational Resources: Usual Extent and Comfort of Conversations

When an individual's usual extent and comfort of conversations are considered together, public self talk seems to be associated with very different DBP and MAP reactivity responses than those observed during either private or non-self talk. Both DBP and MAP reactivity are significantly different during public self talk than they are during private self or non-self talk. Further, differences in reactivity between

private self and non-self talk are no longer apparent. This seems contrary to the present theoretical account of self-construction processes during language use. It was hypothesized that these factors may combine to influence reactivity differences across the three kinds of talk, however they were expected to enhance such differences. Individuals with high conversational resources were expected to display less reactivity during conversations regarding the self, whereas individuals with low conversational resources were expected to display much higher reactivity during these conversations. In other words, it was expected that conversational resources would have a negative impact on cardiovascular reactivity in all three conditions, such that in plotting regression results three negative slopes would be observed, where the gradient of the slopes would increase from non-self, public self to private self talk.

Individuals' usual comfort and extent of conversations affected their MAP reactivity differently when they were talking about public aspects of themselves than when they were talking either about private aspects of themselves or about something that is not focused on the self. Figures 3-5 (page 143) show that during public self talk, women who are more comfortable when they are conversing displayed greater MAP reactivity than individuals who are not so comfortable conversing. This is inconsistent with the present theoretical account, which predicts that the more comfortable an individual usually feels conversing, the easier it is for them to obtain endorsement of their sense of self during any particular conversation, and therefore the less reactivity they would display than others. On the other hand, individuals who do not usually feel comfortable conversing would be expected to find endorsement of their sense of self more difficult, and therefore the more reactivity they would display. These predictions were generally supported during private self and non-self talk, most notably among individuals who engage in a few or very many conversations. However, women who engage in a medium amount of conversations also showed the reverse effect with comfort, but showed it in all three talking conditions.

Similar findings were obtained with DBP reactivity, although usual extent and comfort of conversations combined with talking conditions to have a curvilinear effect. Again,

151

individuals' usual comfort and extent of conversations affected their DBP reactivity differently when they talked about public aspects of themselves than when they talked about either private aspects of themselves or about something not focused on the self. And again, as Figures 6-8 (page 145) show, the relationship between usual comfort and reactivity during public self talk tended to be opposite to that expected (except among those individuals who were both low in extent and comfort, or high in extent and comfort).

The Nature of Public Self Talk

The difference in cardiovascular reactivity between private self and public self talk conditions only appears when conversational resources are considered. Further, when these resources are considered, the cardiovascular reactivity distinction between private and non-self talk *dis*appears. Thus, the question arises: what is it about public self talk that makes it so distinctive, relative to private and non-self talk, when individuals' usual extent and comfort of conversations are considered?

In terms of the present theoretical account, the results suggest that public self talk is not less central to constructing a sense of self compared to private self talk. In fact, as the interactions show, public self talk is *more* central to constructing a sense of self than private self talk among certain subgroups of individuals. Talking about aspects of one's public self is, by definition (and operationalization), talking about things "which ... can be observed by other people ... people may know information regarding your public self by having observed you". In this sense, public self talk concerns information that is already publically available, and therefore has the potential to be validated or checked. On the other hand, private self talk focuses on information that "cannot be obtained by others unless they infer it or you give this information", and therefore cannot be checked against any external, public standard. Due to its nature, it is valid *in its own right.*

Further, because public self talk is about established actions or behaviours, there may

be a sense in which individuals are justifying or accounting for these actions. Two well-known social constructionist theorists, Harré (1983) and Shotter (1993a), have both emphasized the centrality of accountability during conversations for revealing construction processes. It is through justification and accountability that the larger social rules become apparent. When the potential "checkability" is added to talk in which an individual accounts for her actions, then engaging in a conversation regarding public aspects of the self may become very potent for her sense of self.

Among certain individuals, these differences between public self and private self talk may be particularly salient for self-construction processes. The potential that public self talk has for validation, and the possibility of talking as though one is accounting for past actions during this part of the experiment, may have elicited more discomfort in people than the other kinds of talk. Further, individuals who usually feel comfortable while conversing have a history of receiving endorsement and affirmation of their sense of self during conversations. During public self talk, however, they may actually feel less comfortable than they are used to feeling, and therefore their expected endorsement of their sense of self may not be forthcoming. This would be unexpected and unfamiliar, and may actually challenge the individual's frequently endorsed sense of self, a process which would be related to greater cardiovascular reactivity. During private self or non-self talk feelings of discomfort may not be present among these individuals, at least not to such an extent. During non-self talk the talk is not so central to the self, and during private self talk the individual may not feel so threatened as their talk cannot be checked and is unassailable, especially given that they are talking to a stranger.

This would explain why individuals who usually feel more comfortable during talking display greater DBP and MAP reactivity during public self talk than individuals who do not usually feel so comfortable. Yet this may also depend on how much the individual has engaged in conversations in the past. The usual comfort felt during conversations may not actually matter among people who usually engage in many conversations - these people are likely to be familiar with a wide range of contexts

153

and contents of conversations, and probably experience a wide range of feelings across these conversations. Therefore, how comfortable they usually feel during conversations becomes overridden by their experience of many conversations, and familiarity with different processes of self-construction.

This argument can also be used for individuals who do not engage in many conversations. The usual level of comfort for them during conversations may be more important for self-construction processes, as they do not have a wide experience with various conversations. Among these individuals, usual level of comfort would be expected to have a stronger relationship with cardiovascular reactivity during public self talk. This is evident in MAP reactivity.

Yet comfort affects reactivity positively in all conditions among people who usually engage in medium amounts of conversations. This is surprising and suggests that only among these people are self-construction processes operating in a similar manner across the three different talking conditions. This finding is difficult to interpret in self-construction terms. It may be that these people feel less comfortable during all kinds of topics of conversation relative to others. They have not had a wide range of experience with many conversations, nor have they had a very limited range of experience where comfort may play a more important role. On the other hand, people who have engaged in a medium amount of conversations may actually have different *types* of conversations than other people, such that they actually talk less about their private self. People who converse a lot may talk about their private self much more than others, and similarly, people who do not converse much may only be drawn into conversations about their private self. These people may not want, or feel the need, to converse about obvious, public self type topics. People who engage in a medium amount of conversations may have less experience with private self talk, and therefore would feel less comfortable during this talk. However, this does not explain why they might feel less comfortable during a conversation that is not focused on the self.

Private Self-Consciousness, Public Self-Consciousness, Disclosure and Social Competence

Contrary to predictions, cardiovascular reactivity across talk about private aspects of the self, public aspects of the self or something other than the self did not differ according to an individual's private self-consciousness, public self-consciousness, tendency to disclose or their social competence. Three hypotheses (outlined on page 100) regarding the joint effects of individual resources on differences in cardiovascular reactivity across the talking conditions were also not supported, namely those involving social resources (usual comfort during conversations and social competence), linguistic resources (usual comfort during conversations and disclosure) and stable attributes (private self-consciousness, public self-consciousness and social competence).

It may be that these individual resources were not sufficiently 'close' enough to the theoretical framework to be effective in the current study. The only individual resources that affected cardiovascular reactivity across the different kinds of talk were closer theoretically to the self-construction framework than any of the other resources examined. Usual extent and comfort of conversations both focused on the primary realm in which a sense of self is constructed: the realm of conversation. Thus, it may be useful for future work to stay closer to the theoretical account of self-construction and focus on the individual's social relations, use of language, conversational activity and talking behaviour. This may be more valuable than attempting to pull in individual difference attributes, developed in and based on personality or social cognition theories.

Support for a Self-Construction Account of Cardiovascular Reactivity?

The present findings provide some support for the current account of self-construction processes and cardiovascular reactivity. However, a number of specific hypotheses were not supported, and some of the results obtained were rather unexpected.

Although I have tried to account for these unexpected results in terms of the self-construction framework outlined earlier, the difficulty of this task inevitably raises questions about the viability of the proposed theory. The present pattern of findings cannot easily be accounted for by existing theories of cardiovascular reactivity, such as Obrist's (1981) account of active coping or Singer's (1974) notion of engagement-involvement, which has been extended recently by Manuck et al. (1985). Further, while parsimony is one key to a good theory, existing accounts do not appear to integrate many of the existing empirical findings.

The current account of self-construction processes and cardiovascular reactivity looks promising, but the data obtained in the present study make it clear that further theoretical work is required. The self-construction concept encompasses a broad range of specific processes occurring during language use that are important for a sense of self. For example, these processes include endorsing, maintaining, negotiating, renegotiating, creating, actively constructing and challenging a sense of self during conversations. Explication of these processes, defining precisely what they are and what they do for a sense of self, predicting when and how they may occur, and noting their potential differential relationships with cardiovascular reactivity is essential in future theoretical work. Further, distinguishing self-construction from other self constructs, such as self-focus, self-validation, and self-engagement, is also required. Overall, the present results highlight the need for further explication of the notion of self-construction if this theory is to have any explanatory power. On the other hand, consideration of alternative accounts may lead to a way of conceptualizing these and other findings.

The Present Study: Problems and Future Possibilities

The present study raises a number of issues that deserve mention. These include aspects of the measurement process, most notably the Speaking Extent and Comfort Scale; the participants who took part in the study and the generalizability of results;

the level of analysis that was employed in this study; and the possibilities derived from this study for future research.

The SPEACS was employed to measure the extent and comfort of an individual's conversations. This psychological measure required participants to complete questions regarding their conversations, and in this sense was related more closely to what occurred in the laboratory than any of the other psychological measures. Further, participants completed the psychological measures immediately after they had completed the experimental part of the study. There is the possibility that this experience of taking part in the experimental conversations may have influenced the way in which individuals responded to the SPEACS, such that individuals who did not feel very comfortable could have either over-reported or under-reported their usual tendency for comfort during conversations. For example, women who felt uncomfortable during the experimental conversations may have over-reported on the SPEACS comfort subscale to reassure themselves, and to make it clear to the researcher, that *usually* they do feel comfortable engaging in conversations. On the other hand, the experience of feeling uncomfortable during the experimental conversations may have had a halo effect, such that it may have distorted womens' perceptions of how comfortable they usually feel during conversations and negatively biased the way in which they completed the comfort subscale. However, this does not explain the differential effect that comfort had on cardiovascular reactivity during public self talk compared to other kinds of talk.

The present results have been obtained among women only. This thesis is based on the idea that self is developed relationally, and requires complicity, negotiation and collusions (Gergen, 1984). Social constructionists point out that sex is only part of "an individual's capacities [which] emerge from a web of interactions between the biological being and the social environment" (Fausto-Sterling, 1985, p. 8, cited in Lorber & Farrell, 1991). The categories of women and men can be viewed as institutionalized cultural and social statuses (Lorber & Farrell, 1991). Their differences are deeply ingrained in the social world; women and men are related to

differently and experience different relationships, roles and socialization processes. Thus, women and men have different social experiences, and this would affect their sense of self and self-construction processes. Therefore, it would be unwise to assume that the present results apply to men. Lykes (1985) examined whether women and men experience a different kind of sense of self. She predicted that men would have a more individualistic sense of self while women would hold more social notions of their self. Her findings did not fully support this hypothesis, although the specific pattern of results did. Future research should be able to examine the nature of self-construction processes in women and men, and their relationships with cardiovascular reactivity.

The results of the present study are based on aggregated data across a number of women, and therefore do not reveal individual processes of self-construction and cardiovascular reactivity. More refined analyses at the individual level may enable researchers to gain a greater understanding of self-construction processes, and to relate these processes more finely to changes in the cardiovascular system. Such analyses may involve the in-depth examination of an individual participant's speech during a conversation, and predictions regarding endorsement and negotiation of their sense of self based on this could be related to their cardiovascular functioning. Such individual analyses were possible with the present data set, however due to the confined scope of the thesis these analyses were not undertaken. Nevertheless, analyses at the individual level enables further and different knowledge regarding language use, self-construction and cardiovascular reactivity to be gained.

The present study did not find the predicted differences in cardiovascular reactivity between private and public self talk. It may be that the content of talk is not as central to constructing a sense of self as is the context in which the talk is carried out. Shotter (1993a) points out that within the public life of the world of Western individualism, there is a private life with its own distinct way of conversing. This gives private life a special nature, in which people use intimate speech genres (in contrast to public ones). In such intimate speech genres, Shotter claims, people do not

take into account either their own or their conversant's title, class, rank, social importance, or age. Rather, as Bakhtin (1986) argues, they address their conversants almost as if they had merged completely. These genres do not only operate in a private sphere away from public life, but according to Shotter, they "'open up' a special 'inner' self-conscious aspect of life, separate and different from the genres used in public life" (p. 183). Thus, it may be that people are used to constructing their sense of self as a unique, bounded individual in the private realm more than in the public realm (although this does not mean that these private and public distinctions are predetermined: they are constructed historically in the Western tradition (Shotter, 1993a)). Therefore, it may be that talking about information regarding one's private self is no more constructive than talking about one's public self, but talking about oneself in a context which employs private speech genres may be different for self-construction processes than talking about oneself in a context which employs public speech genres. The familiarity of the intimate speech genre and the 'self' talk that occurs in such a context may mean that cardiovascular reactivity is lower during such talk than it is when using a public speech genre. Conversations in the present study, and any conversation that occurs in a laboratory with an unknown researcher, clearly employ a public speech genre. It may be valuable for future research to examine the cardiovascular reactivity during conversations using different speech genres in their relevant social contexts.

Much research has examined the role of social support in cardiovascular reactivity and cardiovascular disease. The present study drew on these findings and examined one particular aspect of this construct that was central to self-construction processes, namely people's usual conversational experience. Future research might benefit if it delineated the aspects of the social support construct that are particularly important for cardiovascular reactivity. This call has been made in the more general area of cardiovascular disease and health; for example, House and colleagues (1988) called for "a broader theory of the biopsychosocial mechanisms and processes linking social relationships to health than can be provided by extant concepts or theories of social support" (p. 543). The present study has shown that an aspect of social support that

may be important for cardiovascular reactivity is the usual extent to which women converse and their comfort felt while doing so. There may be other aspects of conversational behaviour that are worthy of study in this field, such as the availability of target people to talk to, the level of competence felt during conversations, or the specific topics of conversations that people engage in. The importance of mundane, everyday conversation for people, their relationships and their mental well-being has been highlighted by Duck (1990, 1992).

In summary, the present results are generally supportive of the notion that self-construction processes are reflected in cardiovascular activity. Engaging in a conversation about the self is related to greater cardiovascular reactivity than is engaging in a conversation that is not specifically about the self. However, it seems that although we may believe in the primacy of private self information for developing and maintaining a sense of self, the present results suggest that public self information is just as important physiologically, and even more so for certain individuals. Different histories of conversations, and therefore different histories of endorsing, maintaining and negotiating a sense of self, lead to different cardiovascular activity during a specific episode of language use. Taken together, these findings reinforce the notion that we are inherently social beings, and this socialness is reflected in our cardiovascular systems.

Chapter 8
Reflections

Outside the material of signs there is no psyche; there are physiological processes, processes in the nervous system, but no subjective psyche as a special existential quality fundamentally distinct from both the physiological processes occurring within the organism and the reality encompassing the organism from outside ... the psyche is to be localized somewhere between the organism and the outside world, on the borderline separating these two spheres of reality. It is here that an encounter between the organism and the outside world takes place, but the encounter is not a physical one: the organism and the outside world meet here in the sign. (Volosinov, 1929)

This playfulness is the product of [the] shared ability to appreciate the power of redescribing, the poser of language to make new and different things possible and important - an appreciation which becomes possible only when one's aim becomes an expanding repertoire of alternative descriptions rather than The One Right Description (Rorty, 1989).

Social Constructionism

This thesis has drawn on ideas from social constructionism regarding the constructive nature of language and its importance for engaging people in activities through which they construct, negotiate and endorse a sense of self.   However, the social constructionist perspective goes a great deal further than simply providing ideas about, and ways of viewing, language and social interaction.   It defines a perspective regarding the nature of social and (according to some) physical realities, namely that they are created and maintained in and through language and interaction.   As such, it also defines a way of viewing knowledge and the scientific enterprise as located within historical and cultural contexts.

However, social constructionism has been criticized on a number of fronts.   Firstly, this perspective provides the notion of the relational nature of personhood, as Gergen

(1987) clearly points out: "we are now moving to the point in our understanding of knowledge where the individual is being replaced by social process. The auspicious question is whether we can replace individualized theories of self with relational theories" (p. 62). Yet very little definition of 'relational theories' has taken place (Kitzinger, 1992), and therefore the social constructionist critique can leave the researcher paralysed, unable to move forward at all. Secondly, in a related vein, Kitzinger (1992) has noted that social constructionism has been criticized for its ethical relativism. If everything is socially constructed, and the meaning of discourse is never fixed, then everything becomes open to different interpretations, none of which can be rejected. In this sense all viewpoints have equal value as they are all valid interpretations, and therefore one cannot be given more importance than another, even though it may be more ethical and moral. Thirdly, in her criticism of social constructionist writings on the self-concept, Kitzinger points out that social constructionism lacks its own method of research. Finally, and of most relevance to the present work, is the criticism that social constructionism fails completely in its attempt to integrate the physical world, most notably the human body (although 'strong' constructionists maintain this is socially constructed also) into its theories. Leary (1994) applies this criticism to the postmodern paradigm, and her critique applies equally well to social contructionism: "postmodernism is perhaps, most starkly limiting when it fails to take into account that selves and their subjectivities reside in bodies...a postmodern self has weight and mass like any other self" (p. 458).

Social constructionism provides a useful way of conceptualizing and understanding our social and psychological worlds, but does not deal with the realm of physiology. While I have found ideas drawn from the social constructionist paradigm valuable in the present work, I have carried them across into the realist paradigm to examine their relation with physiology. Social constructionism and realism are contradictory in their epistemological and ontological assumptions, and therefore drawing ideas from one perspective and testing them in another deserves comment.

I would argue that the present theory regarding cardiovascular correlates of self-

construction processes incorporates a social-relational conception of the sense of self, and that this account is consistent with a realist conception of our psychological theories of such matters. (Greenwood (1994) has made this argument recently regarding his social theory of personal identity.) Stating that a sense of self is socially constructed in a particular historical time and cultural place does not mean that it cannot be conceptualized as an object. Rather, a sense of self can be viewed as an object which is a product of discursive practices. Positing how a sense of self is derived is useful in psychological theorizing, as it has been in the present framework, but does not mean this process cannot be empirically investigated. As Greenwood (1992) has argued, "any independently meaningful theory when conjoined with auxiliary hypotheses and causal posits can generate empirical predictions." (p. 118).

These ideas regarding the constructive nature of language lend a particular way of viewing the present theoretical and empirical endeavour. This thesis is presented in, in Bakhtin's terms, a typical secondary (or complex) speech genre. Almost all kinds of scientific research are presented through this written, well-developed and organized cultural communication, and scientific readers who know the genre well will be able to predict its structure, length and ending, providing them with easy access to understanding and absorbing the information contained within its boundaries. This is an important aspect of the speech genre. Yet this type of discourse includes ways of talking that aim to highlight the importance of the scientific description and to increase the credibility of what is being claimed. As Duck (1990) has noted, it is important for researchers to be as aware of the language and metaphors used in scientific description as they are of people's everyday talk.

Social constructionism highlights the powerful nature of description. New ways of talking, new ways of seeing, new forms of debate all work to constitute how 'it may become' due to the constructive nature of language (Shotter, 1993a). As Gergen (1992) states, rather than 'telling it like it is' the challenge for the (postmodern) scholar is to 'tell it as it may become'. To be able to do this we need to understand the limitations of language in currency at the relevant point in time and in the relevant

163

context, and to explore new ways of conceptualizing old knowledge. Therefore, I would like to continue to draw on ideas from the social constructionist perspective to reflect on the present study, its value and its place alongside other research into cardiovascular reactivity. Naturally, the first idea provided by this perspective regards the nature of language.

The Nature of Cardiovascular Reactivity Language

The way in which researchers write, speak and converse about cardiovascular reactivity not only provides a flow of information, but simultaneously constructs the ways in which reactivity can be understood and limits alternative understandings. It seems that the most dominant way of viewing cardiovascular reactivity has been in terms of stress and its causal influences. This is highlighted in a recent article on cardiovascular reactivity: "a central question in reactivity research is whether the laboratory procedures used as stressors are in fact stressful, and whether they produce only the type of stress they are intended to elicit" (Jemerin & Boyce, 1992, p. 47). Cardiovascular reactivity findings have been surprising because they have shown that even in apparently non-stressful situations, language use is associated with cardiovascular reactivity. It may be that the way in which reactivity is constructed in our language, the way in which researchers must talk in order to take part in the language games regarding this construct and this research, is in terms of psychological stress affecting physiological functioning.

Lynch and Rosch (1990) have pointed out that the concepts of stress and emotional arousal have affected our understandings of psychophysiology, and that this understanding may actually have limited our perspective and constrained any developments of new understandings. In the context that was set up and reinforced by Darwin, Cannon and Pavlov regarding stress and its pathophysiology, the cause-effect relationship has come to be the only way to conceptualize psychophysiological research. Thus, communication is viewed essentially "as just another 'stimulus' that

164

activates the reflex wiring of the autonomic and neuroendocrine system" (Lynch & Rosch, 1990, p. 37).

Of course there are different ways of talking. Following an outline of his psychophysiological research into happiness and physiology, Gormly (1984) has commented we could talk about physiological functioning affecting our psychological state: "perhaps in attempting to understand people's efforts toward improving the conditions of emotional life, we labelled the problem incorrectly. Rather than say that people are pursuing happiness, and building our studies and theories from that construct, we might better say that people are pursuing some optimal rate of sympathetic nervous system activity, and build our studies and theories from the physiological construct. In the latter case, behaviour is viewed as the activities of the body in the service of the body." (p. 220). Obviously some ways of talking and conceptualizing are non-sensical in our present historical and cultural location, and as Rorty (1985, cited in Kitzinger, 1992) has noted, sometimes we may need to simply accept the fact that we have to start from where we are, and this means there are lots of views which we just cannot take seriously.

Language and Physiology

It appears that the world of language and the world of physiology have been kept separate in both the traditional scientific paradigm and the social constructionist paradigm. This is explicit in Harré's writings, where he claims that there are only two realities - conversation and physiology, and that conversations are the primary structure, creating social and psychological realities. According to Harré (1983), "conversation is to be thought of as creating a social world just as causality generates a physical one" (p. 65). Further, he views the task of psychology as outlining our system of norms of representation and comparing them with an enormous variety of systems, whereas "the rest is physiology". Harré (1989) does comment that "it may turn out that skill kinds and physiological kinds match" (p. 34), although he goes on

165

to say that the current evidence is not supportive of this notion. Perhaps it may be fairer to say that current physiological research has not tended to draw on constructionist ideas regarding psychological phenomena, and therefore there is little evidence on which to base such claims.

Volosinov (1994) has discussed the nature of psychological phenomena (the 'inner psyche) as having the same reality as that of the sign (language). Outside of the sign no inner world exists, according to Volosinov, although there are physiological processes. Thus, there is no subjective psyche with a special existential quality, which is fundamentally distinct from both the physiological processes occurring within the organism and the outside reality. Further, Volosinov contends that these two spheres of reality, the psychological and the physiological, meet on the borderline: "the psyche is to be localized somewhere between the organism and the outside world, on the borderline separating these two spheres of reality. It is here that an encounter between the organism and the outside world takes place, but the encounter is not a physical one: *the organism and the outside world meet here in the sign.*" (p. 56). This view of language may be a useful way of looking at the relationship between psychological phenomena and physiological activity.

In recent years two psychophysiological researchers have begun to discuss the importance of language for physiology. Lynch (1985; Lynch & Rosch, 1990) has highlighted the fact that the human body and its components have previously been examined as a respondent system, and he promotes a view of physiological functioning as intimately involved in a uniquely human activity, namely communication. From this perspective, the influence of language use on physiology is not another 'stimulus' eliciting physiological 'arousal', but is an integral part of language or communication (Lynch & Rosch, 1990). Tardy (1993) has also emphasized a biological perspective on language and social interaction. In a recent review of studies examining the physiological effects of speech, he concluded that "attention to the biological underpinnings of language behaviour provides important insights not only into the communication process but also into the process by which

humans achieve and maintain health" (p. 354).

Thus it appears that although research demonstrates that language is important for physiological systems, and although there has been an awareness that we need to start reconceptualizing language as an important psychological, social and biological activity, little theoretical work has been carried out to achieve this. The present thesis has been an attempt to outline one way of reconceptualizing findings on cardiovascular reactivity, resting BP and cardiovascular disease in terms of language and its constructive properties for a sense of self, and to test these ideas empirically. This, it would seem, opens up one alternative way of talking about cardiovascular reactivity during language use. As Rorty (1989) points out, alternative descriptions enable new and different things to become possible and important. Therefore what is required at present, as social constructionists have stated, is a way of talking about the "relational" self that liberates researchers from the confines of internal mental states and individual attributes, and focuses on the self as an active, negotiated process. Furthermore, and possibly more importantly for health psychologists, we need a way of talking about and viewing this self which is able to integrate people's symbolic activities with their cardiovascular, and more generally, their physiological functioning.

References

Alexander, F. G. (1939). Emotional factors in essential hypertension: Presentation of a tentative hypothesis. *Psychosomatic Medicine, 1,* 175-179.

Allen, K. M., Blascovich, J., Tomaka, J., & Kelsey, R. M. (1991). Presence of human friends and pet dogs as moderators of autonomic responses to stress in women. *Journal of Personality and Social Psychology, 61,* 582-589.

Altman, I., & Taylor, D. A. (1973). *Social penetration: The development of interpersonal relationships.* New York: Holt, Rinehart & Winston.

Andersen, S. M. (1987). The role of cultural assumptions in self-concept development. In K. Yardley & T. Honess (Eds.), *Self and identity: Psychosocial perspectives* (pp. 231-246). New York: John Wiley.

Anderson, N. B. (1989). Racial differences in stress-induced cardiovascular reactivity and hypertension: Current status and substantive issues. *Psychological Bulletin, 105,* 89-105.

Anderson, N. B., McNeilly, M., & Myers, H. F. (1992). A contextual model for research of race differences in autonomic reactivity. In E. H. Johnson, W. D. Gentry & S. Julius (Eds.), *Personality, elevated blood pressure and essential hypertension* (pp. 197-216). Washington: Hemisphere.

Antonucci, T. C., & Johnson, E. H. (1994). Conceptualization and methods in social support theory and research as related to cardiovascular disease. In S. A. Shumaker & S. M. Czajkowski (Eds.), *Social support and cardiovascular disease* (pp. 21-39). New York: Plenum Press.

Averill, J. R. (1982). *Anger and aggression: An essay on emotion.* New York: Springer-Verlag.

Bakhtin, M. M. (1986). *Speech genres and other late essays* (V. W. McGee, Trans.). Austin: University of Texas Press.

Baumeister, R. F. (1987). How the self became a problem: A psychological review of historical research. *Journal of Personality and Social Psychology, 52,* 163-176.

Beaglehole, R., Salmond, C. E., Hooper, A., Huntsman, J., Stanhope, J. M., Cassel, J. C., & Prior, I. A. M. (1977). Blood pressure and social interaction in Tokelauan migrants in New Zealand. *Journal of Chronic Disease, 30,* 803-812.

Berkman, L. F. (1985). The relationship of social networks and social support to morbidity and mortality. In S. Cohen & S. L. Syme (Eds.), *Social support and health* (pp. 241-262). London: Academic Press.

Berkman, L. F., & Syme, S. L. (1979). Social networks, host resistance and mortality: A nine-year follow-up study of Alameda County residents. *American Journal of Epidemiology, 109,* 186-204.

168

Berman, L. A. (1992). First person identities in Indonesian conversational narratives. *Journal of Asian Pacific Communication, 3,* 3-14.

Bland, S. H., Krogh, V., Winkelstein, W., & Trevisan, M. (1991). Social network and blood pressure: A population study. *Psychosomatic Medicine, 53,* 598-607.

Bloor, D. (1983). *Wittgenstein: A social theory of knowledge.* London: MacMillan.

Booth-Kewley, S., & Friedman, H. S. (1987). Psychological predictors of heart disease: A quantitative review. *Psychological Bulletin, 101,* 343-362.

Brandtstädter, J. (1990). Development as a personal and cultural construction. In G. R. Semin & K. J. Gergen (Eds.), *Everyday understandings: Social and scientific implications* (pp. 83-107). London: Sage.

Branscombe, N. R., & Wann, D. L. (1992). Physiological arousal and reactions to outgroup members during competitions that implicate an important social identity. *Aggressive Behaviour, 18,* 85-93.

Brown, P. C., & Smith, T. W. (1992). Social influence, marriage and the heart: Cardiovascular consequences of interpersonal control in husbands and wives. *Health Psychology, 11,* 88-96.

Brown, T. G., Szabo, A., & Seraganian, P. (1988). Physical versus psychological determinants of heart rate reactivity to mental arithmetic. *Psychophysiology, 25,* 532-537.

Bruner, J. (1995). Meaning and self in cultural perspective. In D. Bakhurst & C. Sypnowich (Eds.), *The social self* (pp. 18-29). London: Sage.

Buck, C. W., & Donner, A. P. (1984). Blood pressure control in hypertensives: A model for the study of life events. *Journal of Chronic Disease, 37,* 247-253.

Burnard, P., & Morrison, P. (1992). *Self-disclosure: A contemporary analysis.* Aldershot: Avebury.

Byrne, D. G. (1992). Anxiety, neuroticism, depression and hypertension. In E. H. Johnson, W. D. Gentry, & S. Julius (Eds.), *Personality, elevated blood pressure and essential hypertension* (pp. 67-85). Washington: Hemisphere.

Cacioppo, J. T., Petty, R. E., & Marshall-Goodell, B. (1985). Physical, social and inferential elements of psychophysiological measurement. In P. Karoly (Ed.), *Measurement strategies in health psychology* (pp. 263-299). New York: Wiley.

Carroll, D. (1992). *Health psychology: Stress, behaviour and disease.* London: The Falmer Press.

Carvalho, J. J. M., Lima, J. A. C., Carvalho, J. V., & de Souza, C. A. M. (1985). Blood pressure is directly related to the degree of acculturation among primitive Yanomano Indians. *Circulation (Suppl. III), 72,* 296, No. 1181.

Christensen, A. J., & Smith, T. W. (1993). Cynical hostility and cardiovascular reactivity during self-disclosure. *Psychosomatic Medicine, 55,* 193-202.

169

Cohen, J. (1977). *Statistical power analysis for the behavioral sciences*. New York: Academic Press.

Cohen, S. (1988). Psychosocial models in the role of social support in the etiology of physical disease. *Health Psychology, 7*, 269-297.

Cohen, S., & Hoberman, H. M. (1983). Positive events and social support as buffers of life change stress. *Journal of Applied Psychology, 13*, 99-125.

Cohen, S., Kaplan, J. R., & Manuck, S. B. (1994). Social support and coronary heart disease: Underlying psychological and biological mechanisms. In S. A. Shumaker & S. M. Czajkowski (Eds.), *Social support and cardiovascular disease* (pp. 195-221). New York: Plenum Press.

Collier, M. J., & Thomas, M. (1988). Cultural identity: An interpretive perspective. In Y. Y. Kim & W. B. Gudykunst (Eds.), *Theories in intercultural communication* (pp. 99-120). London: Sage.

Collins, N. L., & Miller, L. C. (1994). Self-disclosure and liking: A meta-analytic review. *Psychological Bulletin, 116*, 457-475.

Cooley, C. H. (1967). *Human nature and the social order*. New York: Schocken. (Original work published 1902).

Cozby, P. C. (1973). Self-disclosure: A literature review. *Psychological Bulletin, 79*, 73-91.

Crawford, J., Kippax, S., Onyx, J., Gault, U., & Benton, P. (1992). *Emotion and gender*. London: Sage.

Csordas, T. J. (1994). Self and person. In P. K. Bock (Ed.), *Psychological anthropology* (pp. 331-350). Westport, USA: Praeger.

Cumes-Rayner, D. P., & Price, J. (1988). Blood pressure reactivity: Pitfalls in methodology. *Journal of Psychosomatic Research, 32*, 181-190.

Cumes-Rayner, D. P., & Price, J. (1989a). Understanding hypertensive behaviour: I. Preference not to disclose. *Journal of Psychosomatic Research, 33*, 63-74.

Cumes-Rayner, D. P., & Price, J. (1989b). Checklists for measuring response style in hypertensives. *Journal of Psychosomatic Research, 33*, 133-146.

Cumes-Rayner, D. P., & Price, J. (1990). Understanding hypertensives behaviour: II. Perceived social approval and blood pressure reactivity. *Journal of Psychosomatic Research, 34*, 141-152.

Davidson, D. M. (1994). An introduction to cardiovascular disease. In S. A. Shumaker & S. M. Czajkowski (Eds.), *Social support and cardiovascular disease* (pp. 1-19). New York: Plenum Press.

Davies, B., & Harré, R. (1990). Positioning: The discursive production of selves. *Journal for the Theory of Social Behavior, 20,* 43-63.

Dembroski, T. M., & Costa, P. T. Jr. (1987). Coronary prone behavior: Components of the Type A behavior pattern and hostility. *Journal of Personality, 55,* 211-235.

Diamond, E. L. (1982). The role of anger and hostility in essential hypertension and coronary heart disease. *Psychological Bulletin, 92,* 410-433.

Dimsdale, J. E., Pierce, C., Schoenfeld, D., Brown, A., Zusman, R., & Graham, R. (1986). Suppressed anger and blood pressure: The effects of race, sex, social class, obesity and age. *Psychosomatic Medicine, 48,* 430-436.

Dimsdale, J. E., Stern, M. J., & Dillon, E. (1988). The stress interview as a tool for examining physiological reactivity. *Psychosomatic Medicine, 50,* 64-71.

Dimsdale, J. E., Young, D., Moore, R., & Strauss, H. W. (1987). Do plasma norepinephrine levels reflect behavioral stress? *Psychosomatic Medicine, 49,* 375-382.

Dressler, W. W. (1982). *Hypertension and culture change: Acculturation and disease in the West Indies.* New York: Redgrave.

Dressler, W. W. (1990). Lifestyle, stress and blood pressure in a southern Black community. *Psychosomatic Medicine, 52,* 182-198.

Dressler, W. W. (1991). Social support, lifestyle incongruity and arterial blood pressure in a southern Black community. *Psychosomatic Medicine, 53,* 608-620.

Dressler, W. W. (1994). Cross-cultural differences and social influences in social support and cardiovascular disease. In S. A. Shumaker & S. M. Czajkowski (Eds.), *Social support and cardiovascular disease* (pp. 167-192). New York: Plenum Press.

Dressler, W. W., Mata, A., Chavez, A., Viteri, F. E., & Gallagher, P. (1986). Social support and arterial pressure in a central Mexican community. *Psychosomatic Medicine, 48,* 338-350.

Dressler, W. W., Santos, J. E. D., & Viteri, F. E. (1986). Blood pressure, ethnicity and psychosocial resources. *Psychosomatic Medicine, 48,* 509-519.

Drummond, P. D. (1982). Personality traits in young males at risk for hypertension. *Journal of Psychosomatic Research, 26,* 585-589.

Duck, S. (1992). *Human relationships* (2nd ed.). London: Sage.

Duck, S. W. (1990). Relationships as unfinished business: Out of the frying pan and into the 1990s. *Journal of Social and Personal Relationships, 7,* 5-28.

Edwards, D. (1991). Categories are for talking: On the cognitive and discursive bases of categorization. *Theory and Psychology, 1,* 515-542.

Edwards, D., Potter, J., & Middleton, D. (1992). Toward a discursive psychology of remembering. *The Psychologist, Oct,* 441-455.

Ell, K., & Dunkel-Schetter, C. (1994). Social support and adjustment to myocardial infarction, angioplasty, and coronary artery bypass surgery. In S. A. Shumaker & S. M. Czajkowski (Eds.), *Social support and cardiovascular disease* (pp. 301-332). New York: Plenum Press.

Engebretson, T. O., Matthews, K. A., & Scheier, M. F. (1989). Relations between anger expression and cardiovascular reactivity: Reconciling inconsistent findings through a matching hypothesis. *Journal of Personality and Social Psychology, 57,* 513-521.

Esterling, B. A., Antoni, M. H., Fletcher, M. A., Margulies, S., & Schneiderman, N. (1994). Emotional disclosure through writing or speaking modulates latent epstein-barr virus antibody titers. *Journal of Consulting and Clinical Psychology, 62,* 130-140.

Ewart, C. K. (1994). Nonshared environments and heart disease risk: Concepts and data for a model of coronary-prone behavior. In E. M. Hetherington, D. Reiss & R. Plomin (Eds.), *The separate social worlds of siblings* (pp. 175-204). New Jersey: Lawrence Erlbaum & Associates.

Ewart, C. K., Burnett, K. F., & Taylor, C. B. (1983). Communication behaviours that affect blood pressure: An abab analysis of marital interaction. *Behaviour Modification, 7,* 331-344.

Ewart, C. K., & Kolodner, K. B. (1991). Social competence interview for assessing physiological reactivity in adolescents. *Psychosomatic Medicine, 53,* 289-304.

Ewart, C. K., & Kolodner, K. B. (1994). Negative affect, gender, and expressive style predict elevated ambulatory blood pressure in adolescents. *Journal of Personality and Social Psychology, 66,* 596-605.

Ewart, C. K., Taylor, C. B., Kraemer, H. C., & Agras, W. S. (1991). High blood pressure and marital discord: Not being nasty matters more than being nice. *Health Psychology, 10,* 155-163.

Eyer, J. (1975). Hypertension as a disease of modern society. *International Journal of Health Services, 5,* 539-557.

Fenigstein, A. (1979). Self-consciousness, self-attention, and social interaction. *Journal of Personality and Social Psychology, 37,* 75-86.

Fenigstein, A., Scheier, M. F., & Buss, A. H. (1975). Public and private self-consciousness: Assessment and theory. *Journal of Consulting and Clinical Psychology, 43,* 522-527,

Fleiss, J. L. (1971). Measuring nominal scale agreement among many raters. *Psychological Bulletin, 76,* 378-382.

Fleming-Moran, M., & Coimbra, C. E. (1990). Blood pressure studies among Amazonian native populations: A review from an epidemiological perspective. *Social Science and Medicine, 31,* 593-601.

Folkow, B. (1982). Physiological aspects of primary hypertension. *Physiological Reviews, 62,* 347-504.

Francis, M. E., & Pennebaker, J. W. (1992). Putting stress into words: The impact of writing on physiological, absentee and self-reported well-being measures. *American Journal of Health Promotion, 6,* 280-287.

Frazer, E. (1989). Feminist talk and talking about feminism: Teenage girls' discourses of gender. *Oxford Review of Education, 15,* 281-290.

Fredrikson, M., Tuomisto, M., Lundberg, U., & Melin, B. (1990). Blood pressure in healthy men and women under laboratory and naturalistic conditions. *Journal of Psychosomatic Research, 34,* 675-686.

Friedman, M., Thomas, S. A., Kulick-Ciuffo, D., Lynch, J. J., & Suginohara, M. (1982). The effects of normal and rapid speech on blood pressure. *Psychosomatic Medicine, 44,* 545-553.

Friedmann, E., Katcher, A. H., Thomas, S. A., Lynch, J. J., & Messent, P. (1983). Social interaction and blood pressure: Influence of animal companions. *Journal of Nervous and Mental Disease, 151,* 461-465.

Friedmann, E., Locker, B. Z., & Lockwood, R. (1993). Perception of animals and cardiovascular responses during verbalization with an animal present. *Anthrozoös, 6,* 115-134.

Geertz, C. (1984). "From the native's point of view". On the nature of anthropological understanding. In R. Shweder & R. LeVine (Eds.), *Culture theory: Essays on mind, self and emotion* (pp. 123-136). Cambridge: Cambridge University Press.

Gentry, W. D., Chesney, A. P., Gary, H. E., Hall, R. P., & Harburg, E. (1982). Habitual anger-coping styles: 1. Effect on mean blood pressure and risk for essential hypertension. *Psychosomatic Medicine, 44,* 195-202.

Gergen, K. J. (1984). Theory of the self: Impasse and evolution. In L. Berkowitz (Ed.), *Advances in experimental social psychology, Vol. 17* (pp. 49-115). New York: Academic Press.

Gergen, K. J. (1985). The social constructionist movement in modern psychology. *American Psychologist, 40,* 266-275.

Gergen, K. J. (1987). Toward self as relationship. In K. Yardley & T. Honess (Eds.), *Self and identity: Psychosocial perspectives* (pp. 53-63). New York: John Wiley.

Gergen, K. J. (1991). *The saturated self.* USA: Basic Books.

Gergen, K. J. (1992). Toward a postmodern psychology. In S. Kvale (Ed.), *Psychology and postmodernism* (pp. 17-30). London: Sage.

Gergen, K. J. (1995). Metaphor and monophony in the 20th-century psychology of emotions. *History of the Human Sciences, 8,* 1-23.

Gerhards, J. (1989). The changing culture of emotions in modern society. *Social Science Information, 28,* 737-754.

Gerin, W., Milner, D., Chawla, S., & Pickering, T. G. (1995). Social support as a moderator of cardiovascular reactivity in women: A test of the direct effects and buffering hypotheses. *Psychosomatic Medicine, 57,* 16-22.

Gerin, W., Pieper, C., Levy, R., & Pickering, T. G. (1992). Social support in social interaction: A moderator of cardiovascular reactivity. *Psychosomatic Medicine, 54,* 324-336.

Girdler, S. S., Pedersen, C. A., Stern, R. A., & Light, K. C. (1993). Menstrual cycle and premenstrual syndrome: Modifiers of cardiovascular reactivity in women. *Health Psychology, 12,* 180-192.

Girdler, S. S., Turner, J. R., Sherwood, A., & Light, K. C. (1990). Gender differences in blood pressure control during a variety of behavioral stressors. *Psychosomatic Medicine, 52,* 571-591.

Gold, A. E., & Johnson, D. W. (1990). Anger, hypertension and heart disease. In P. Bennett, J. Weinman, & P. Surgeon (Eds.), *Current developments in health psychology* (pp. 105-128). Chur: Harwood.

Gold, M. R., & Franks, P. (1990). The social origin of cardiovascular risk: An investigation in a rural community. *International Journal of Health Services, 20,* 405-416.

Gormly, J. B. (1984). Social interactions and psychophysiology. In W. M. Waid (Ed.), *Sociophysiology* (pp. 199-224). New York: Springer-Verlag.

Graham, J. D. P. (1945). High blood pressure after battle. *Lancet,* 239-240.

Greenwood, J. D. (1992). Discursive practices and psychological science. *American Behavioral Scientist, 36,* 114-123.

Greenwood, J. D. (1994). A sense of identity: Prolegomena to a social theory of personal identity. *Journal for the Theory of Social Behaviour, 24,* 25-46.

Grossberg, J. M., Alf, E. F. Jr., & Vormbrock, J. K. (1988). Does pet dog presence reduce human cardiovascular responses to stress? *Anthrozoös, 2,* 38-44.

Gumperz, J. J., & Cook-Gumperz, J. (1982). Introduction: Language and the communication of social identity. In J. J. Gumperz (Ed.), *Language and social identity* (pp. 1-21). Cambridge: Cambridge University Press.

Hall, P. S., Thomas, A. A., Friedmann, E., Sappington, E., & Lynch, J. J. (1982). Measurement of neonatal blood pressure. A new methodology. *Psychology, 19,* 231-236.

Hampson, S. E. (1988). *The construction of personality: An introduction* (2nd ed.). London: Routledge.

Handkins, R. E., & Munz, D. C. (1978). Essential hypertension and self-disclosure. *Journal of Clinical Psychology, 34,* 870-875.

Hanna, J. M., & Baker, P. T. (1979). Biocultural correlates of the blood pressure of Samoan migrants in Hawaii. *Human Biology, 51,* 481-497.

Harburg, E., Gleiberman, L., Russell, M., & Cooper, M. L. (1991). Anger-coping styles and blood pressure in black and white males: Buffalo, New York. *Psychosomatic Medicine, 53,* 153-164.

Hardy, J. D., & Smith, T. W. (1988). Cynical hostility and vulnerability to disease: Social support, life stress and physiological response to conflict. *Health Psychology, 7,* 447-459.

Hardy, T. J. (1989). The relationship between the Type A Behaviour Pattern and physiological responsivity: A quantitative review. *Psychophysiology, 26,* 110-119.

Harré, R. (1983). *Personal Being.* Oxford: Blackwell.

Harré, R. (1984). Social elements as mind. *British Journal of Medical Psychology, 57,* 127-135.

Harré, R. (Ed.). (1986). *The social construction of emotions.* Oxford: Basil Blackwell.

Harré, R. (1989). Language games and texts of identity. In J. Shotter & K. J. Gergen (Eds.), *Texts of identity* (pp. 20-35). London: Sage.

Harré, R. (1991). The discursive production of selves. *Theory and Psychology, 1,* 51-63.

Harré, R. (1993). Reappraising social psychology: Rules, roles and rhetoric. *The Psychologist,* 21-28.

Harré, R., & Gillet, G. (1994). *The discursive mind.* London: Sage.

Haynes, S. G., & Feinleib, M. (1980). Women, work and coronary heart disease: Prospective findings from the Framingham heart study. *American Journal of Public Health, 70,* 133-141.

Haynes, S. G., Feinleib, M., & Kannel, W. (1980). The relationship of psychosocial factors to coronary heart disease in the Framingham study: III. 8 year incidence of coronary heart disease. *American Journal of Epidemiology, 111,* 37-58.

Hazuda, H. P. (1994). A critical evaluation of U.S. epidemiological evidence and ethnic variation. In S. A. Shumaker & S. M. Czajkowski (Eds.), *Social support and cardiovascular disease* (pp. 119-142). New York: Plenum Press.

Helgeson, V. S. (1991). The effects of masculinity and social support on recovery from myocardial infarction. *Psychosomatic Medicine, 52,* 27-41.

Henderson, P. R., Bakal, B. A., & Dunn, B. E. (1990). Cardiovascular response patterns and speech: A study of air traffic controllers. *Psychosomatic Medicine, 52,* 27-41.

Henry, J. P., & Cassell, J. C. (1969). Psychosocial factors in essential hypertension. *American Journal of Epidemiology, 90,* 171-200.

Hertzog, C., & Rovine, M. (1985). Repeated-measures analysis of variance in developmental research: Selected issues. *Child Development, 56,* 787-809.

Hinson, J. A., & Swanson, J. L. (1993). Willingness to seek help as a function of self-disclosure and problem severity. *Journal of Counseling and Development, 71,* 465-470.

Holtgraves, T. (1990). The language of self-disclosure. In H. Giles & W. P. Robinson (Eds.), *Handbook of language and social psychology* (pp. 191-207). Chichester: John Wiley & Sons.

House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science, 241,* 540-545.

Jaccard, J., Turrisi, R., & Wan, C. K. (1990). *Interaction effects in multiple regression.* London: Sage.

James, S. A. (1987). Psychosocial precursors of hypertension: A review of the epidemiological evidence. *Circulation, 76,* 100-106.

Janes, C. R. (1990). Migration, changing gender roles and stress: The Samoan case. *Medical Anthropology, 12,* 217-248.

Jemerin, J. M., & Boyce, W. T. (1992). Commentary: Cardiovascular markers of biobehavioral reactivity. *Developmental and Behavioral Pediatrics, 13,* 46-49.

Jenkins, C. D. (1971). Psychologic and social precursors of coronary disease. *New England Journal of Medicine, 284,* 244-255, 307-317.

Jenkins, C. D. (1988). Epidemiology of cardiovascular diseases. *Journal of Consulting and Clinical Psychology, 56,* 324-332.

Jennings, J. R., Kamarck, T., Stewart, C., Eddy, M., & Johnson, P. (1992). Alternate cardiovascular baseline assessment techniques: Vanilla or resting baseline. *Psychophysiology, 29,* 742-750.

Johnson, E. H., Gentry, W. D., & Julius, S. (Eds.). (1992). *Personality, elevated blood pressure and essential hypertension.* Washington: Hemisphere.

Johnson, E. H., Schork, N. J., & Spielberger, C. D. (1987). Emotional and familial determinants of elevated blood pressure in black and white adolescent females. *Journal of Psychosomatic Research, 31,* 731-741.

Jourard, S. M. (1971). *Self-disclosure: An experimental analysis of the transparent self.* New York: Wiley.

Jupp, T. C., Roberts, C., & Cook-Gumperz, J. (1982). Language and disadvantage: The hidden process. In J. J. Gumperz (Ed.), *Language and social identity* (pp. 232-256). Cambridge: Cambridge University Press.

Kahn, H. A., Medalie, J. H., Neufeld, N. N., Riss, E., & Goldbourt, U. (1972). The incidence of hypertension and associated factors: The Israel ischemic heart disease study. *American Heart Journal, 84,* 171-182.

Kamarck, T. W., Manuck, S. B., & Jennings, J. R. (1990). Social support reduces cardiovascular reactivity to psychological challenge: A laboratory model. *Psychosomatic Medicine, 52,* 42-58.

Kannel, W. B. (1976). Recent highlights from the Framingham Study. *Australian and New Zealand Journal of Medicine, 6,* 373-386.

Kaplan, S. M., Gottschalk, L. A., Magliocco, B., Rohovit, D., & Ross, W. D. (1961). Hostility in verbal productions and hypnotic 'dreams' of hypertensive patients. *Psychosomatic Medicine, 23,* 311-322.

Kasl, S. V., & Cobb, S. (1970). Blood pressure changes in men undergoing job loss: A preliminary report. *Psychosomatic Medicine, 32,* 19-38.

Kasl, S. V., & Rapp, S. R. (1991). Stress, health and well-being: The role of individual differences. In C. L. Cooper & R. Payne (Eds.), *Personality and stress: Individual differences in the stress process* (pp. 269-285). New York: John Wiley & Sons.

Kerby, A. P. (1991). *Narrative and the self.* Bloomington: Indiana University Press.

Kitzinger, C. (1992). The individuated self concept: A critical analysis of social-constructionist writing on individualism In G. M. Breakwell (Ed.), *Social Psychology of identity and the self concept* (pp. 221-250). London: Academic Press.

Kleinke, C. L., & Williams, G. (1994). Effects of interviewer status, touch and gender on cardiovascular reactivity. *The Journal of Social Psychology, 134,* 247-249.

Knapp, P. H., Levy, E. M., Giorgi, R. G., Black, P. H., Fox, B. H., & Heeren, T. C. (1992). Short-term immunological effects of induced emotion. *Psychosomatic Medicine, 54,* 133-148.

Knight, R. G., Chisholm, B. J., Paulin, J. M., & Waal-Manning, H. J. (1991). The Spielberger anger expression scale: Factor structure and correlations with blood pressure. In C. D. Spielberger, I. G. Sarason, J. Strelau, & J. M. T. Brebner (Eds.), *Stress and anxiety* (pp. 167-173). New York: Hemisphere.

Knox, S. S. (1993). Perception of social support and blood pressure in young men. *Perceptual and Motor Skills, 77,* 132-134.

Krantz, D. S., & Manuck, S. B. (1984). Acute psychophysiologic reactivity and risk of cardiovascular disease: A review and methodologic critique. *Psychological Bulletin, 96,* 435-464.

Krantz, D. S. et al. (1987). Task Force 1: Psychosocial factors in hypertension. *Circulation, 76,* 84-88.

Lassner, J. B., Matthews, K. A., & Stoney, C. M. (1994). Are cardiovascular reactors to asocial stress also reactors to social stress? *Journal of Personality and Social Psychology, 66,* 69-77.

Lather, P. (1992). Postmodernism and the human sciences. In S. Kvale (Ed.), *Psychology and postmodernism* (pp. 88-109). London: Sage.

Leary, K. (1994). Psychoanalytic "problems" and postmodern "solutions". *Psychoanalytic Quarterly, 63,* 433-463.

Lepore, S. J. (1995). Cynicism, social support, and cardiovascular reactivity. *Health Psychology, 14,* 210-216.

Lepore, S. J., Allen, K. M., & Evans, G. W. (1993). Social support lowers cardiovascular reactivity to an acute stressor. *Psychosomatic Medicine, 55,* 518-524.

Lewinsohn, P. M., Mischel, W., Chaplin, W., & Barton, R. (1980). Social competence and depression: The role of illusory self-perceptions. *Journal of Abnormal Psychology, 89,* 203-212.

Liehr, P. (1992). Uncovering a hidden language: The effects of listing and talking on blood pressure and heart rate. *Archives of Psychiatric Nursing, 6,* 306-311.

Light, K. C., Turner, J. R., Hinderliter, A. L., & Sherwood, A. (1993). Race and gender comparisons: 1. Hemodynamic responses to a series of stressors. *Health Psychology, 12,* 354-365.

Linden, W. (1987). A microanalysis of autonomic activity during human speech. *Psychosomatic Medicine, 49,* 562-578.

Linden, W., Chambers, L., Maurice, J., & Lenz, J. W. (1993). Sex differences in social support, self-deception, hostility and ambulatory cardiovascular activity. *Health Psychology, 12,* 376-380.

Linden, W., & Feuerstein, M. (1981). Essential hypertension and social coping behaviour. *Journal of Human Stress, 9,* 28-34.

Litowitz, B. E., & Gundlach, R. A. (1987). When adolescents write: Semiotic and social dimensions of adolescents personal writing. *Adolescent Psychiatry, 14,* 82-111.

Llabre, M. M., Spitzer, S. B., Saab, P. G., Ironson, G. H., & Schneiderman, N. (1991). The reliability and specificity of delta versus residualized change as measures of cardiovascular reactivity to behavioral challenges. *Psychophysiology, 28,* 701-711.

Logan, R. D. (1987). Historical change in prevailing sense of self. In K. Yardley & T. Honess (Eds.), *Self and identity: Psychosocial perspectives* (pp. 13-26). New York: John Wiley.

Long, J. M., Lynch, J. J., Machiran, N. M., Thomas, S. A., & Malinow, K. L. (1982). The effect of status on blood pressure during verbal communication. *Journal of Behavioural Medicine, 5,* 165-172.

Lorber, J., & Farrell, S. S. (Eds.). (1991). *The social construction of gender.* London: Sage.

Lovallo, W. R., & Pishkin, V. (1980). Type A behavior, self-involvement, autonomic activity, and the traits of neuroticism and extraversion. *Psychosomatic Medicine, 42,* 329-334.

Lowenthal, M. F., & Haven, C. (1968). Interaction and adaptation: Intimacy as a critical variable. *American Sociological Review, 33,* 20-30.

Luckmann, T. (1983). *Life-World and Social Realities.* London: Heinemann Educational.

Lutz, C. A. (1988). *Unnatural emotions.* Chicago: University of Chicago Press.

Lykes, M. B. (1985). Gender and individualistic vs. collectivist bases for notions about the self. *Journal of Personality, 53,* 356-383.

Lynch, J. J. (1985). *The Language of the Heart: The Body's Response to Human Dialogue.* New York: Basic Books.

Lynch, J. J., Long, J. M., Thomas, S. A., Malinow, K. L., & Katcher, A. H. (1981). The effects of talking on the blood pressure of hypertensive and normotensive individuals. *Psychosomatic Medicine, 43,* 25-33.

Lynch, J. J., Lynch, K. E., & Friedmann, E. (1992). A cry unheard: Sudden reductions in blood pressure while talking about feelings of hopelessness and helplessness. *Integrative Physiological and Behavioural Science, 27,* 151-169.

Lynch, J. J., & Rosch, P. J. F. (1990). The heart of dialogue: Human communication and cardiovascular health. In H. Balner (Ed.), *A new medical model: A challenge for biomedicine?* (pp. 31-52). Amsterdam: Swets & Zeitlinger.

Lynch, J. J., Thomas, S. A., Long, J. M., Malinow, K. L., Chikadonz, G., & Katcher, A. H. (1980). Human speech and blood pressure. *The Journal of Nervous and Mental Disease, 168,* 526-534.

Lynch, J. J., Thomas, S. A., Paskewitz, D. A., Malinow, K. L., & Long, J. M. (1982). Interpersonal aspects of blood pressure control. *Journal of Nervous and Mental Disease, 170,* 143-153.

Lyons, A. C., & Spicer, J. (1996). A new measure of conversational experience: The speaking extent and comfort scale (SPEACS). *Manuscript submitted for publication.*

Malinow, K. L., Lynch, J. J., Foreman, P. J., Friedman, E., & Thomas S. A. (1986). Blood pressure increases while signing in a deaf population. *Psychosomatic Medicine, 48,* 95-101.

Malm, L. (1993). The eclipse of meaning in cognitive psychology: Implications for humanistic psychology. *Journal of Humanistic Psychology, 33,* 67-87.

Manuck, S. B., Kasprowicz, A. L., & Muldoon, M. F. (1990). Behaviorally evoked cardiovascular reactivity and hypertension: Conceptual issues and potential associations. *Annals of Behavioral Medicine, 12,* 17-29.

Manuck, S. B., Morrison, R. L., Bellack, A. S., & Polefrone, J. M. (1985). Behavioral factors in hypertension: Cardiovascular responsivity, anger and social competence. In M. A. Chesney, S. Goldston & R. H. Rosenman, (Eds.), *Anger and Hostility in Cardiovascular and Behavioral Disorders* (pp. 149-172). New York: Hemisphere/McGraw-Hill.

Markus, H., & Cross, S. (1990). The interpersonal self. In L. A. Pervin (Ed.), *Handbook of personality theory and research* (pp. 576-608). New York: Guilford Press.

Marmot, M. G. (1983). Stress, social and cultural variations in heart disease. *Journal of Psychosomatic Research, 27,* 377-384.

Matthews, K. A. (1982). Psychological perspectives on the Type A behavior pattern. *Psychological Bulletin, 91,* 293-323.

Matthews, K. A. (1988). Coronary heart disease and Type A behaviors: Update on and alternative to the Booth-Kewley and Friedman quantitative analysis. *Psychological Bulletin, 104,* 373-380.

Matthews, K. A., Manuck, S. B., & Saab, P. G. (1986). Cardiovascular responses of adolescents during a naturally occurring stressor and their behavioral and psychophysiological predictors. *Psychophysiology, 23,* 198-209.

McClelland, D. C. (1979). Inhibited power motivation and high blood pressure in men. *Journal of Abnormal Psychology, 88,* 182-190.

McDermott, R. P., & Church, J. (1976). Making sense and feeling good: The ethnography of communication and identity work. *Communication, 2,* 121-142.

McGarvey, S. T., & Baker, P. T. (1979). The effects of modernisation and migration on Samoan blood pressures. *Human Biology, 51,* 461-479.

McGrady, A., & Higgins, T. (1990). Effect of repeated measurements of blood pressure on blood pressure in essential hypertension: Role of anxiety. *Journal of Behavioral Medicine, 13,* 93-101.

McKegney, F. P., & Williams, R. B., Jr. (1967). Psychological aspects of hypertension: II. The differential influence of interview variables on blood pressure. *American Journal of Psychiatry, 123,* 1539-1545.

McNamara, K., & Hackett, G. (1986). Gender, sex-type and cognitive distortion: Self-perceptions of social competence among mild depressives. *Social Behavior and Personality, 14,* 113-121.

Mead, G. H. (1967). *Mind, self and society.* Chicago: University of Chicago Press. (Original work published 1934).

Menkes, M. S., et al. (1989). Cardiovascular reactivity to the cold pressor test as a predictor of hypertension. *Hypertension, 14,* 524-530.

Middleton, D., & Edwards, D. (1990). *Collective remembering.* London: Sage.

Miller, P. J. (1994). Narrative practices: Their role in socialization and self-construction. In U. Neisser & R. Fivush (Eds.), *The remembering self* (pp. 158-179). Cambridge: Cambridge University Press.

Misra, G. (1993). Psychology from a constructionist perspective: An interview with Kenneth J. Gergen. *New Ideas in Psychology, 11,* 399-414.

Morrison, R. L., Bellack, A. S., & Manuck, S. B. (1985). Role of social competence in borderline hypertension. *Journal of Consulting and Clinical Psychology, 53,* 248-255.

Mühlhäusler, P., & Harré, R. (1990). *Pronouns and people: The linguistic constructions of social and personal identity.* Oxford: Basil Blackwell.

Myers, H. F., & Miles, R. E. (1981). Life events stress, subjective appraisal and somatization in hypertension: A pilot study. *Journal of Human Stress, 7,* 17-27.

Näring, G. W., de Mey, H. R., & Schaap, C. P. (1988). Blood pressure response during verbal interaction: Review and prospect. *Current Psychological Research and Reviews, 7,* 187-198.

Niaura, R., Wilson, T., & Westrick, E. (1988). Self-awareness, alcohol consumption, and reduced cardiovascular reactivity. *Psychosomatic Medicine, 50,* 360-380.

Nye, E. R., Paulin, J., & Russell, D. G. (1992). Blood pressure in a random sample of the New Zealand population. *The New Zealand Medical Journal, 105,* 1-3.

Oatley, K. (1992). *'Best-laid schemes'. The psychology of emotions.* USA: Cambridge University Press.

Obrist, P. A. (1981). *Cardiovascular Psychophysiology: A Perspective.* New York: Plenum Press.

Obrist, P. A. et al. (1983). Behavioral-cardiac interactions in hypertension. In D. S. Krantz, A. Baum & J. E. Singer (Eds.), *Handbook of Psychology and Health: Vol III. Cardiovascular disorders and behaviour* (pp. 199-230). New Jersey: Lawrence Erlbaum Associates.

Ochs, E. (1993). Constructing social identity: A language socialization perspective. *Research on Language and Social Interaction, 26,* 287-306.

Olsen, O. (1993). Impact of social network on cardiovascular mortality in middle aged Danish men. *Journal of Epidemiology and Community Health, 47,* 176-180.

Orth-Gomer, K. (1994). International epidemiological evidence for a relationship between social support and cardiovascular disease. In S. A. Shumaker & S. M. Czajkowski (Eds.), *Social support and cardiovascular disease* (pp. 97-118). New York: Plenum Press.

181

Orth-Gomer, K., Rosengren, A., & Wilhelmsen, L. (1993). Lack of social support and incidence of coronary heart disease in middle-aged Swedish men. *Psychosomatic Medicine, 55,* 37-43.

Parker, I. (1989). Discourse and power. In J. Shotter & K. J. Gergen (Eds.), *Texts of identity* (pp. 56-69). London: Sage.

Paul, O. (1979). Epidemiology of hypertension. In F. H. Gross & J. I. S. Robertson (Eds.), *Arterial hypertension* (pp. 15-24). London: Focal Press.

Pennebaker, J. W. (1988). Confiding traumatic experiences and health. In S. Fisher and J. Reason (Eds.), *Handbook of Life Stress, Cognition and Health* (pp. 669-682). Chichester: John-Wiley & Sons.

Pennebaker, J. W. (1990). *Opening up: The healing power of confiding in others.* New York: William Morrow.

Pennebaker, J. W., & Beall, S. K. (1986). Confronting a traumatic event: Toward an understanding of inhibition and disease. *Journal of Abnormal Psychology, 95,* 274-281.

Pennebaker, J. W., Hughes, C. F., & O'Heeron, R. C. (1988). The psychophysiology of confession: Linking inhibitory and psychosomatic processes. *Journal of Personality and Social Psychology, 52,* 781-793.

Pennebaker, J. W., Kiecolt-Glaser, J. K., & Glaser, R. (1988). Disclosure of traumas and immune function: Health implications for psychotherapy. *Journal of Consulting and Clinical Psychology, 56,* 239-245.

Pennebaker, J. W., & Susman, J. R. (1988). Disclosure of traumas and psychosomatic processes. *Social Science and Medicine, 26,* 327-332.

Pfiffner, W., Nil, R., & Bättig, K. (1987). Psychophysiological reactivity and speech behaviour during the structured Type A interview and a self-disclosure monologue. *International Journal of Psychophysiology, 5,* 1-9.

Pickering, T. G. (1989). Ambulatory monitoring: Applications and limitations. In N. Schneiderman, S. M. Weiss & P. G. Kaufmann (Eds.), *Handbook of research methods in cardiovascular behavioral medicine* (pp. 261-272). New York: Plenum Press.

Pickering, T. G., & Blank, S. G. (1989). The measurement of blood pressure. In N. Schneiderman, S. M. Weiss & P. G. Kaufmann (Eds.), *Handbook of research methods in cardiovascular behavioral medicine* (pp. 69-79). New York: Plenum Press.

Pickering, T. G., & Gerin, W. (1992). Does cardiovascular reactivity have pathogenic significance in hypertensive patients? In E. H. Johnson, W. D. Gentry, & S. Julius (Eds.), *Personality, elevated blood pressure and essential hypertension* (pp. 151-173). Washington: Hemisphere.

Potter, J., & Wetherell, M. (1987). *Discourse and social psychology: Beyond attitudes and behaviour.* London: Sage.

Prisbell, M., & Dallinger, J. M. (1991). The developmental nature of self-disclosure. *Psychological Reports, 68*, 211-214.

Radley, A. R. (1982). Theory and data in the study of 'coronary proneness' Type A behaviour pattern. *Social Science and Medicine, 16*, 107-114.

Ralph, A. (1990). Variations of verbal behaviour and the assessment of social competence in dyadic interactions. *Australian Journal of Psychology, 42*, 261-275.

Rathus, S. A. (1973). A 30-item schedule for assessing assertive behavior. *Behavior Therapy, 4*, 398-406.

Reed, D., McGee, D., Yano, K., & Feinleib, M. (1983). Social networks and coronary heart disease among Japanese men in Hawaii. *American Journal of Epidemiology, 117*, 384-396.

Reiser, M. F., Thaler, M., & Weiner, H. (1955). The experimental manipulation of projective stimuli in the study of psychophysiological responses. *Psychosomatic Medicine, 17*, 480.

Rejeski, W. J., Gagne, M., Parker, P. E., Koritnik, D. R. (1989). Acute stress reactivity from contested dominance in dominant and submissive males. *Behavioral Medicine, 14*, 118-124.

Riger, S. (1992). Epistemological debates, feminist voices: Science, social values and the study of women. *American Psychologist, 47*, 730-740.

Roland, A. (1991). The self in cross-civilizational perspective: An Indian-Japanese-American comparison. In R. C. Curtis (Ed.), *The relational self* (pp. 160-180). New York: The Guildford Press.

Rorty, R. (1989). *Contingency, irony and solidarity*. Cambridge: Cambridge University Press.

Rosaldo, M. Z. (1984). Toward an anthropology of self and feeling. In R. Shweder & R. LeVine (Eds.), *Culture theory: Essays on mind, self and emotion* (pp. 137-157). Cambridge: Cambridge University Press.

Rose, G. A. (1985). Hypertension in the community. In C. J. Bulpitt (Ed.), *Epidemiology of Hypertension (vol 6)*, (pp. 1-14). Amsterdam: Elsevier.

Rosenman, R. H. (1992). Type A Behaviour Pattern and cardiovascular reactivity: Is there a relationship with hypertension? In E. H. Johnson, W. D. Gentry, & S. Julius (Eds.), *Personality, blood pressure and essential hypertension* (pp. 87-111). Washington: Hemisphere.

Ryle, G. (1949). *The concept of mind*. London: Hutchinson.

Sampson, E. E. (1983). Deconstructing Psychology's subject. *The Journal of Mind and Behavior, 4*, 135-164.

Sampson, E. E. (1988). The debate on individualism. *American Psychologist, 43*, 15-22.

Sampson, E. E. (1989). The deconstruction of self. In J. Shotter & K. J. Gergen (Eds.), *Texts of identity* (pp. 1-19). London: Sage.

Sampson, E. E. (1993). *Celebrating the other: A dialogic account of human nature.* San Francisco: Westview Press.

Sarason, B. R., Sarason, I. G., & Pierce, G. R. (Eds.). (1990). *Social support: An interactional view.* New York: John-Wiley.

Scheier, M. F., & Carver, C. S. (1977). Self-focused attention and the experience of emotion: Attraction, repulsion, elation and depression. *Journal of Personality and Social Psychology, 35,* 625-636.

Scherwitz, L., & Canick, J. D. (1988). Self-reference and coronary heart disease risk. In K. Houston & C. R. Snyder (Eds.), *Type A Behavior Pattern: Current trends and future directions* (pp. 146-167). New York: John Wiley & Sons.

Scherwitz, L., Berton, K., & Leventhal, H. (1978). Type A behavior, self-involvement, and cardiovascular response. *Psychosomatic Medicine, 40,* 593-609.

Scotch, N. A. (1963). Sociological factors in epidemiology of Zulu hypertension. *American Journal of Public Health, 53,* 1205-1213.

Scragg, R., Baker, J., Metcalf, P., & Dryson, E. (1993). Hypertension and its treatment in a New Zealand multi-cultural workforce. *The New Zealand Medical Journal, 106,* 147-150.

Sebba, G. (1972). Time and the modern self: Descartes, Rousseau, Beckett. In J. T. Fraser, F. C. Haber & G. H. Müller (Eds.), *The study of time* (pp. 452-469). Berlin: Springer-Verlag.

Seeman, T. E., & Syme, S. L. (1987). Social networks and coroanry artery disease: A comparison of the structure and function of social relations as predictors of disease. *Psychosomatic Medicine, 49,* 341-354.

Semenchuk, E. M., & Larkin, K. T. (1993). Behavioral and cardiovascular responses to interpersonal challenges among male offspring of essential hypertensives. *Health Psychology, 12,* 416-419.

Semin, G. R. (1990). Everyday assumptions, language and personality. In G. R. Semin & K. J. Gergen (Eds.), *Everyday understandings: Social and scientific implications* (pp. 151-175). London: Sage.

Shaffer, D. R., & Tomarelli, M. M. (1989). When public and private self-foci clash: Self-consciousness and self-disclosure reciprocity during the acquaintance process. *Journal of Personality and Social Psychology, 56,* 765-776.

Sheffield, D., & Carroll, D. (1994). Social support and cardiovascular reactions to active laboratory stressors. *Psychology and Health, 9,* 305-316.

Sherwood, A., & Turner, J. R. (1992). A conceptual and methodological overview of cardiovascular reactivity research. In J. R. Turner, A. Sherwood & K. C. Light (Eds.), *Individual Differences in cardiovascular response to stress* (pp. 3-32). New York: Plenum Press.

Shotter, J. (1993a). *Cultural politics of everyday life*. Buckingham: Open University Press.

Shotter, J. (1993b). Becoming someone: Identity and belonging. In N. Coupland & J. F. Nussbaum (Eds.), *Discourse and lifespan identity* (pp. 5-27). London: Sage.

Shweder, R. A., & Bourne, E. J. (1984). Does the concept of the person vary cross-culturally? In R. A. Shweder & R. Levine (Eds.), *Culture theory: Essays on mind, self and emotion* (pp. 158-199). Cambridge: Cambridge University Press.

Siegel, J. M. (1992). Anger and cardiovascular health. In H. S. Friedman (Ed.), *Hostility, coping and health* (pp. 49-64). Washington DC: APA.

Siegman, A. W., Dembroski, T. M., & Crump, D. (1992). Speech rate, loudness and cardiovascular reactivity. *Journal of Behavioral Medicine, 15,* 519-532.

Silverberg, D. S., & Rosenfeld, J. B. (1980). The effect of quiet conversation on the blood pressure of hypertensive patients. *Israel Journal of Medical Science, 16,* 41-43.

Singer, M. T. (1974). Engagement-Involvement: A central phenomenon in psychophysiological research. *Psychosomatic Medicine, 36,* 1-17.

Singer, J. L., & Bonanno, G. A. (1990). Personality and private experience: Individual variations in consciousness and in attention to subjective phenomena. In L. A. Pervin (Ed.), *Handbook of personality theory and research* (pp. 419-444). New York: Guilford Press.

Slater, M. A., Good, A. B., & Dimsdale, J. E. (1992). The stress interview in hypertension research. In E. H. Johnson, W. D. Gentry & S. Julius, *Personality, elevated blood pressure and essential hypertension* (pp. 175-196). Washington: Hemisphere.

Smith, T. W. (1992). Hostility and health: Current status of a psychosomatic hypothesis. *Health Psychology, 11,* 139-150.

Smith, T. W., & Allred, K. D. (1989). Blood pressure responses during social interaction in high and low cynically hostile males. *Journal of Behavioral Medicine, 12,* 135-143.

Smith, T. W., Allred, K. D., Morrison, C. A., & Carlson, S. D. (1989). Cardiovascular reactivity and interpersonal influence: Active coping in a social context. *Journal of Personality and Social Psychology, 56,* 209-218.

Smith, T. W., Baldwin, M., & Christensen, A. J. (1990). Interpersonal influence as active coping: Effects of task difficulty on cardiovascular reactivity. *Psychophysiology, 27,* 429-437.

Smith, T. W., & Christensen, A. J. (1992). Cardiovascular reactivity and interpersonal relations: Psychosomatic processes in social context. *Journal of Social and Clinical Psychology, 11,* 279-301.

Sommers-Flanagan, J., & Greenberg, R. (1989). Psychosocial variables and hypertension. *Journal of Nervous and Mental Disease, 177,* 15-24.

Spicer, J. (1996). *Why is chronic stress inversely related to resting blood pressure?* Paper presented at the Third New Zealand Health Psychology Conference, Okoroire, New Zealand.

Spicer, J., & Chamberlain, K. (in press). Cynical hostility, anger and resting blood pressure. *Journal of Psychosomatic Research.*

Spicer, J., Jackson, R., & Scragg, R. (in press). Type A behaviour, social contact and coronary death. *Psychology and Health.*

Spicer, J., Jackson, R., & Scragg, R. (1993). The effects of anger management and social contact on risk of myocardial infarction in Type As and Type Bs. *Psychology and Health, 8,* 243-255.

Spitzer, S. B., Llabre, M. M., Ironson, G. H. Gellman, M. D., & Schneiderman, N. (1992). The influence of social situations on ambulatory blood pressure. *Psychosomatic Medicine, 54,* 79-86.

Stein, P. K., & Boutcher, S. H. (1993). Heart-rate and blood-pressure responses to speech alone compared with cognitive challenges in the stroop task. *Perceptual and Motor Skills, 77,* 555-563.

Stephens, M. A., Crowther, J. H., Koss, P. G., & Bolen, K. (1988). Effects of daily activities and social behaviour on blood pressure elevation. *Journal of Behavioural Medicine, 11,* 553-563.

Stroebe, W., Stroebe, M. S., Gergen, K. J., & Gergen, M. (1982). The effects of bereavement on mortality: A social psychological analysis. In J. R. Eiser (Ed.), *Social psychology and behavioral medicine* (pp. 527-560). New York: John Wiley & Sons.

Strogatz, D. S., & James, S. A. (1986). Social support and hypertension among Blacks and Whites in a rural, southern community. *American Journal of Epidemiology, 124,* 949-956.

Suarez, E. C., Harlan, E., Peoples, M. C., & Williams, R. B., Jr. (1993). Cardiovascular and emotional responses in women: The role of hostility and harassment. *Health Psychology, 12,* 459-468.

Suarez, E. C., & Williams, R. B., Jr. (1989). Situational determinants of cardiovascular and emotional reactivity in high and low hostile men. *Psychosomatic Medicine, 51,* 404-418.

Surtees, P. G. (1980). Social support, residual adversity and depressive outcome. *Social Psychiatry, 15,* 71-80.

Surwit, R. S., Williams, R. B., & Shapiro, D. (1982). *Behavioural approaches to cardiovascular disease.* New York: Academic Press.

Svensson, J., & Theorell, T. (1983). Life events and elevated blood pressure in young men. *Journal of Psychosomatic Research, 27,* 445-456.

Tardy, C. H. (1993). Biological perspectives on language and social interaction. *American Behavioral Scientist, 36,* 339-358.

Tardy, C. H., Allen, M. T., Thompson, W. R., & Leary, M. R. (1991). Social anxiety and cardiovascular responses to interpersonal communication. *The Southern Communication Journal, 57,* 25-34.

Tardy, C. H., Thompson, W. R., & Allen, M. T. (1989). Cardiovascular responses during speech: Does social support mediate the effects of talking on blood pressure? *Journal of Language and Social Psychology, 8,* 271-285.

Theorell, T. Svensson, J., Knox, S., Waller, D., & Alvarez, M. (1986). Young men with high blood pressure report few recent life events. *Journal of Psychosomatic Research, 30,* 243-249.

Thomas, S. A., Friedman, E., Lottes, L. S., Gresty, S., Miller, C., & Lynch, J. J. (1984). Changes in nurses' blood pressure and heart rate while communicating. *Research in Nursing and Health, 7,* 119-126.

Totman, R. (1982). Psychosomatic theories. In J. R. Eiser (Ed.), *Social psychology and behavioral medicine* (pp. 143-175). New York: John Wiley & Sons.

Totman, R. (1985). *Social and Biological Roles of Language: The Psychology of Justification.* London: Academic Press.

Totman, R. (1988). Stress, language and illness. In S. Fisher & J. Reason (Eds.), *Handbook of Life Stress, Cognition and Health* (pp. 531-542). Chichester: Wiley.

Triandis, H. C. (1976). *Variations in Black and White perceptions of the social environment.* Urbana: University of Illinois Press.

Turner, J. R. (1994). *Cardiovascular reactivity and stress: Patterns of physiological response.* New York: Plenem Press.

Turner, J. R., Sherwood, A., & Light, K. C. (1990). Generalization of cardiovascular response: Supportive evidence for the reactivity hypothesis. *International Journal of Psychophysiology, 11,* 207-212.

Valk, J. M. van der. (1957). Blood pressure changes under emotional influences in patients with essential hypertension and control subjects. *Journal of Psychosomatic Research, 2,* 134-146.

Van Langenhove, L., & Harré, R. (1993). Positioning and autobiography: Telling your life. In N. Coupland & J. F. Nussbaum (Eds.), *Discourse and lifespan identity* (pp. 81-99). London: Sage.

Van Egeren, L. F., & Gellman, M. D. (1992). Cardiovascular reactivity to everyday events. In E. H. Johnson, W. D. Gentry & S. Julius (Eds.), *Personality, elevated blood pressure and essential hypertension* (pp. 135-150). Washington: Hemisphere.

Van Egeren, L. F., & Sparrow, A. W. (1990). Ambulatory monitoring to assess real-life cardiovascular reactivity in Type A and Type B subjects. *Psychosomatic Medicine, 52,* 297-306.

Verhave, T., & van Hoorn, W. (1984). The temporalization of the self. In K. J. Gergen & M. M. Gergen (Eds.), *Historical Social Psychology* (pp. 325-345). New Jersey: Lawrence Erlbaum Associates.

Volosinov, V. N. (1994). Marxism and the philosophy of language (I. R. Titunik, Trans.). In P. Morris (Ed.), *The Bakhtin reader* (pp. 50-61). London: Edward Arnold.

Vormbrock, J. K., & Grossberg, J. M. (1988). Cardiovascular effects of human-pet dog interactions. *Journal of Behavioral Medicine, 11,* 509-517.

Waldron, I., Notowaski, M., Freimer, M. et al. (1982). Cross-cultural variations in blood pressure: A quantitative analysis of the relationships of blood pressure to cultural characteristics, salt consumption and body weight. *Social Science and Medicine, 16,* 419-430.

Watson, D., & Friend, R. (1969). Measurement of social-evaluative anxiety. *Journal of Consulting and Clinical Psychology, 33,* 448-457.

Weiner, H., Singer, M. T., & Reiser, M. F. (1962). Cardiovascular responses and their psychological correlates: A study in healthy young adults and patients with peptic ulcer and hypertension. *Psychosomatic Medicine, 24,* 477-498.

Weiner, H. (1979). *Psychobiology of essential hypertension.* New York: Elsevier.

Welin, L., Larsson, B., Svärdsudd, K., Tibblin, B., & Tibblin, G. (1992). Social network and activities in relation to mortality from cardiovascular disease, cancer and other causes: A 12 year follow up of the study of men born in 1913 and 1923. *Journal of Epidemiology and Community Health, 46,* 127-132.

Wertsch, J. V. (1991). *Voices of the mind: A sociocultural approach to mediated action.* Cambridge, Mass.: Harvard University Press.

Williams, R. B., Kimball, C. P., & Williard, H. N. (1972). The influence of interpersonal interaction on diastolic blood pressure. *Psychosomatic Medicine, 34,* 194-198.

Wittgenstein, L. (1967). *Philosophical Investigations.* (2nd ed.) (G. Transcombe, Trans.). Oxford: Blackwell.

Wolman, B. B. (1988). *Psychosomatic disorders.* New York: Plenum Press.

Wood, C. (1986). The hostile heart. *Psychology Today, 20,* 10-12.

Wood, C. S., & Gans, L. P. (1986). Contrasting patterns of blood pressure and related factors within a Maori and European population in New Zealand. *Social Science and Medicine, 5,* 439-444.

Wortman, C. B., Sheedy, C., Gluhoski, V., & Kessler, R. (1992). Stress, coping and health: Conceptual issues and directions for future research. In H. S. Friedman (Ed.), *Hostility, coping and health* (pp. 227-257). Washington D.C.:APA.

Wright, L. (1988). The Type A behavior pattern and coronary artery disease: Quest for the active ingredients and the elusive mechanism. *American Psychologist, 43*, 2-14.

Appendix A

Information Sheet, Letter to Participants and Consent Form

Blood Pressure Reactivity and Language Use

Information Sheet

What is this study about?
The aim of this study is to explore how different dimensions of language use are related to blood pressure reactivity levels. The research is being run by Antonia Lyons as a thesis for her PhD under supervision in the Psychology department at Massey University.

Am I eligible to take part?
You are eligible to take part in this study if you are not on medication for blood pressure and have not been told by your doctor that you have a blood pressure problem.

What would I have to do?
If you agree to take part, you would need to come to the Psychology building on a weekday for an appointment that would take no more than an hour of your time. For half of that time, you would be asked to talk about specific topics while your blood pressure is continuously monitored. Your talk would be audiotaped and may be transcribed for analysis. In the remaining half of the time, you would be asked to complete a questionnaire which asks about your verbal behaviour and your general disposition.

What can I expect from the researcher?
If you take part in the study, you have the right to:
* refuse to answer any particular question, and to withdraw from the study at any time
* ask any further questions about the study that occur to you during your participation
* provide information on the understanding that it is completely confidential to the researcher. All records are identified by code number, and are seen only by the researcher. It will not be possible to identify you in any reports that result from the study
* be given a summary of the findings from the study when it has concluded

It is important to emphasise that I will not be offering advice about your physical or mental health, since the information I am collecting is not suitable for that purpose. If you have any concerns about your health it is assumed you would take appropriate action, as you would normally.

If you are interested in taking part, please let me know. We will then arrange an appointment time suitable for us both. Please ring me at 3569099 ext. 4162 if you have any further questions.

Antonia Lyons

Letter to Participants

Dear Participant,

Thank you very much for agreeing to take part in this study. Your appointment time for the study is
_____ on _____.
Please come to room 3.16 at the Psychology Department Building, Massey University at that time. If you find that you are unable to keep the appointment please let me know by telephoning 3569099 (extension 4162 or messages to 7694) during business hours.

Please retain the Information Sheet that sets out the details of the study and a Consent Form and bring these with you to the appointment. I will answer any further questions you may have before we sign the Consent Form. Feel free to contact me at Massey before the appointment if you have any other queries.

Finally, could you please refrain from the following activities for one hour before your appointment: strenuous exercise, eating, drinking anything other than water, smoking, or taking drugs that may affect blood pressure. This is necessary so that I can obtain accurate measures of your blood pressure.

I look forward to seeing you there.

Yours sincerely,

Antonia Lyons

Blood Pressure Reactivity and Language Use

Consent Form

I have read the Information Sheet for this study and have had the details of the study explained to me. My questions about the study have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I also understand that I am free to withdraw from the study at any time, or decline to answer any particular questions in the study. I agree to provide information to the researchers on the understanding that it is completely confidential.

I wish to participate in this study under the conditions set out on the Information Sheet.

Signed: _____

Name: _____

Date: _____

Researcher: _____

I also agree that the researcher may use brief direct quotations from the written or verbal material I produce during the study in her reports of the research, provided these do not identify me in any way.

Signed: _____

Researcher: _____

Appendix B

Instructions for Each Experimental Section

Initial:

"These first few minutes are just to get you accustomed to the blood pressure cuff, which inflates automatically every 60 seconds. It should be quite tight when it inflates, and you'll get used to it after a while. If it becomes uncomfortable or hurts, please let me know. So, while you get used to that, I'll tell you a little about this study. I'll be asking you to speak about different things at different times, and you'll be able to choose which specific topic you'd like to speak about from a list that I'll give you. This is not meant to be stressful, so I won't ask you to speak about things you don't want to. As you can see, this will all be recorded. Now, if you'd just like to relax and be silent for a couple of minutes, then I'll let you know when it's time for the next section."

Spot the Difference Rest and Baseline:

"Okay, now I'd like you to look at these pictures and look for differences between them. This is just to fill in time and to help you relax a bit, and I'm not going to ask you whether you found any differences or not, nor how many. It's just to give you something to do, so don't feel you have to find a specific number of differences or anything. However, I'd still like you to concentrate on the pictures, so we can get an accurate measure of your resting blood pressure. It's important that you do this in silence."

Relax Rest and Baseline:

"For the next four minutes I'd just like you to relax and sit quietly and without speaking. I'll tell you when the four minutes is up."

Choice private:

"In this section I'd like to talk with you about things to do with yourself that aren't observable to other people, like your moods, emotions, physical feelings. I have a list of 5 different topics that you can choose from, so you can have a look at these. If you pick a topic and run out of things to say, just pick another topic and start talking about that."

Choice public:

"In this section I'd like to talk with you about public aspects of yourself. These are things that can be observed by other people - other people probably know these things about you by simply seeing or knowing you and what you do. This isn't about what other people think about you - it's about things that other people probably know about you. I have a list of 5 topics for this section, so can you look at these and choose one to talk about. If you run out of things to say on one topic, just talk about another one of these topics."

Choice non-self:

"For this section, I'd like to talk with you about something that isn't so directly focused on yourself. Here are a list of things you may talk about, the posters are on the wall here, and the photos are here. The easiest way to do this is for you to describe it to me, as if you were talking to me over the phone."

N.B. The 'Spot the Difference' instructions were not used in the main study.

Appendix C
SPSS/PC Commands

The desire to investigate simple contrasts between two conditions and interactions in this repeated measures design was problematic, and it was necessary to carry out non-standard SPSS/PC analyses. Due to the non-standard nature of the commands used for these analyses, each command is provided here for information and reference.

Main Effect of Talking Condition on Cardiovascular Reactivity

The following examples will use SBP Reactivity as the dependent variable across the three private, public and non-self talking conditions. To analyse the main effect for talking condition in this repeated measures design, the following command was used:

> MANOVA sbppvtch sbppubch sbpnonch
> /WSFACTORS talkcond (3)
> /PRINT CELLINFO (MEANS) TRANSFORM.

This command provides a multivariate and univariate test. However, it applies an orthogonal transformation matrix to the dependent variables prior to analysis because the averaged tests of significance require orthogonal contrasts. This means that only orthogonal contrasts between variables can be requested.

Simple Contrasts Between Variables

To examine non-orthogonal contrasts, such as simple contrasts between two variables, the WSFACTORS subcommand cannot be used. Rather, the variables should be transformed as required and an analysis subcommand included to separate the transformed variables into effects. This enables the overall multivariate tests to be equivalent to those in the WSFACTORS analysis, thus fitting the same model (Nicholls, 1994, personal communication). It also enables simple contrasts between two variables to be examined (e.g. SBP reactivity between private self and public self talk). The SPSS/PC command is given below:

> MANOVA sbppvtch sbppubch sbpnonch
> /TRANSFORM (sbppvtch sbppubch sbpnonch) = SIMPLE (3)
> /RENAME const pvtvnon pubvnon
> /PRINT TRANSFORM
> /ANALYSIS = (const / pvtvnon pubvnon).

To obtain the third contrast, this analysis was repeated and SIMPLE (3) was simply changed to SIMPLE (2), and the rename subcommand modified appropriately.

Linear and Curvilinear Interaction Effects of Psychological Variable X Talking Condition on Cardiovascular Reactivity[3]

To examine the linear interaction of social anxiety and talking condition on SBP reactivity, the following commands were used (note that in this context an interaction translates into the effect of a covariate):

```
MANOVA sbppvtch sbppubch sbpnonch WITH socanx
/TRANSFORM (sbppvtch sbppubch sbpnonch) = SIMPLE (3)
/RENAME const pvtvnon pubvnon *
/PRINT TRANSFORM
/ANALYSIS = (const / pvtvnon pubvnon) WITH socanx.
```

Again, this was repeated to obtain the third simple contrast.

Curvilinear effects were examined in a similar manner, using the square of the psychological variable:

```
COMPUTE sqsocanx = socanx ** 2.

MANOVA sbppvtch sbppubch sbpnonch WITH socanx sqsocanx
/TRANSFORM (sbppvtch sbppubch sbpnonch) = SIMPLE (3)
/RENAME const pvtvnon pubvnon * *
/PRINT TRANSFORM
/ANALYSIS = (const / pvtvnon pubvnon) WITH socanx sqsocanx.
```

---

[3] Unfortunately, in attempting to understand these results a bug in the SPSS MANOVA programme was discovered. Fortunately, this bug did not affect the regression results. In using the MANOVA subcommand /PMEANS, in combination with a covariate and multiple analyses through separating the transformed variables, the sums of squares for the main effect changed drastically. Due to the confusion this led to, I contacted David Nicholls, Senior Support Statistician for SPSS, and queried the results. He replied that this was an undetected bug in the MANOVA programme and would be filed as such. The /PMEANS subcommand was not used.

Appendix D

Blood Pressure and Language Questionnaire

Sex: Female ☐ Male ☐

Age: _____

The following few items concern how you see yourself. Please indicate how well each of these items describes you. Circle only one number for each item. If the item describes you very well, circle 4. If the item does not describe you well at all, circle 0, and so on.

0	1	2	3	4
not at all				very

I'm always trying to figure myself out 0 1 2 3 4

I'm concerned about my style of doing things 0 1 2 3 4

Generally, I'm not very aware of myself 0 1 2 3 4

It takes me time to overcome my shyness in new situations 0 1 2 3 4

I reflect about myself a lot 0 1 2 3 4

I'm concerned about the way I present myself 0 1 2 3 4

I'm often the subject of my own fantasies 0 1 2 3 4

I have trouble working when someone is watching me 0 1 2 3 4

I never scrutinize myself 0 1 2 3 4

I get embarrassed very easily 0 1 2 3 4

I'm self-conscious about the way I look 0 1 2 3 4

I don't find it hard to talk to strangers 0 1 2 3 4

I'm generally attentive to my inner feelings 0 1 2 3 4

I usually worry about making a good impression 0 1 2 3 4

I'm constantly examining my motives 0 1 2 3 4

I feel anxious when I speak in front of a group 0 1 2 3 4

One of the last things I do before I leave my house is look in the mirror . . 0 1 2 3 4

I sometimes have the feeling that I'm off somewhere watching myself 0 1 2 3 4

I'm concerned about what other people think of me 0 1 2 3 4

I'm alert to changes in my mood 0 1 2 3 4

I'm usually aware of my appearance 0 1 2 3 4

I'm aware of the way my mind works when I work through a problem 0 1 2 3 4

196

0 —————— 1 —————— 2 ———— 3 ————— 4
not at all   very

Large groups make me nervous 0 1 2 3 4

Friendly 0 1 2 3 4

Popular 0 1 2 3 4

Assertive 0 1 2 3 4

Attractive 0 1 2 3 4

Warm 0 1 2 3 4

I communicate clearly . . . . . . : 0 1 2 3 4

Socially skillful 0 1 2 3 4

Interested in other people 0 1 2 3 4

I understand what others say 0 1 2 3 4

Humorous . . . . : 0 1 2 3 4

I speak fluently 0 1 2 3 4

Open and self-disclosing 0 1 2 3 4

Reasonable 0 1 2 3 4

Confident . . . . ; 0 1 2 3 4

Trusting 0 1 2 3 4

I have a positive outlook on life 0 1 2 3 4

I notice good experiences 0 1 2 3 4

The next section concerns how often you have conversations with various people, and how comfortable you feel when you are talking to them. Could you please answer the same set of questions regarding how often you have conversations with, (including phone conversations), and how comfortable you feel talking to, each of the following: partner/spouse, best friend, other friends, relatives, and acquaintances.

Partner/spouse

1. Think about your <u>partner/spouse</u>. Please place <u>one</u> tick to indicate how frequently you have a conversation with your partner/spouse:

    not applicable / never ☐ → Go to question 5
    11 or more times per day ☐
    6 - 10 times per day ☐
    1 - 5 times per day ☐
    several times per week ☐
    several times per month ☐
    several times per year ☐

2. Please circle the number that best describes how *comfortable* you feel, in general, when you talk with your partner/spouse:
    not at all comfortable   1   2   3   4   5   6   7   very comfortable

3. Think about how often you have a conversation with your partner/spouse about anything to do with yourself. Please place <u>one</u> tick to indicate how frequently you have a conversation with your partner/spouse <u>about yourself</u>:

never	☐ → Go to question 5
11 or more times per day	☐
6 - 10 times per day	☐
1 - 5 times per day	☐
several times per week	☐
several times per month	☐
several times per year	☐

4. Please circle the number that best describes how *comfortable* you feel, in general, when you talk with your partner/spouse <u>about yourself</u>:

not at all comfortable   1   2   3   4   5   6   7   very comfortable

Best friend

5. Think about your <u>best friend</u>, other than your partner/spouse. Please place <u>one</u> tick to indicate how frequently you have a conversation with this best friend:

not applicable / never	☐ → Go to question 9
11 or more times per day	☐
6 - 10 times per day	☐
1 - 5 times per day	☐
several times per week	☐
several times per month	☐
several times per year	☐

6. Please circle the number that best describes how *comfortable* you feel, in general, when you talk with this best friend:

not at all comfortable   1   2   3   4   5   6   7   very comfortable

7. Think about how often you have a conversation with this best friend about anything to do with yourself. Please place <u>one</u> tick to indicate how frequently you have a conversation with this best friend <u>about yourself</u>:

never	☐ → Go to question 9
11 or more times per day	☐
6 - 10 times per day	☐
1 - 5 times per day	☐
several times per week	☐
several times per month	☐
several times per year	☐

8. Please circle the number that best describes how *comfortable* you feel, in general, when you talk with this best friend <u>about yourself</u>:

not at all comfortable   1   2   3   4   5   6   ·7   very comfortable

Other Friends

9. Think about your <u>other friends</u>. Please place <u>one</u> tick to indicate how frequently you have a conversation with these friends:

not applicable / never	☐ → Go to question 13
11 or more times per day	☐
6 - 10 times per day	☐
1 - 5 times per day	☐
several times per week	☐
several times per month	☐
several times per year	☐

10. Please circle the number that best describes how *comfortable* you feel, in general, when you talk with these friends:

    not at all comfortable   1   2   3   4   5   6   7   very comfortable

11. Think about how often you have a conversation with these friends about anything to do with yourself. Please place <u>one</u> tick to indicate how frequently you have a conversation with these friends <u>about yourself</u>:

never	☐ → Go to question 13
11 or more times per day	☐
6 - 10 times per day	☐
1 - 5 times per day	☐
several times per week	☐
several times per month	☐
several times per year	☐

12. Please circle the number that best describes how *comfortable* you feel, in general, when you talk with these friends <u>about yourself</u>:

    not at all comfortable   1   2   3   4   5   6   7   very comfortable

Relatives

13. Think about your <u>relatives</u> (do not include those relatives you have already considered in a previous category). Please place <u>one</u> tick to indicate how frequently you have a conversation with these relatives:

not applicable / never	☐ → Go to question 17
11 or more times per day	☐
6 - 10 times per day	☐
1 - 5 times per day	☐
several times per week	☐
several times per month	☐
several times per year	☐

14. Please circle the number that best describes how *comfortable* you feel, in general, when you talk with these relatives:

    not at all comfortable   1   2   3   4   5   6   7   very comfortable

15. Think about how often you have a conversation with these relatives about anything to do with yourself. Please place <u>one</u> tick to indicate how frequently you have a conversation with these relatives <u>about yourself</u>:

never	☐ → Go to question 17
11 or more times per day	☐
6 - 10 times per day	☐
1 - 5 times per day	☐
several times per week	☐
several times per month	☐
several times per year	☐

16. Please circle the number that best describes how *comfortable* you feel, in general, when you talk with these relatives <u>about yourself</u>:

    not at all comfortable   1   2   3   4   5   6   7   very comfortable

Acquaintances

17. Think about the <u>acquaintances you see most often</u> (again, do not include people you have already considered in a previous category). Please place <u>one</u> tick to indicate how frequently you have a conversation with these acquaintances:

<div style="text-align:right">

not applicable / never ☐ → Go to the next section
11 or more times per day ☐
6 - 10 times per day ☐
1 - 5 times per day ☐
several times per week ☐
several times per month ☐
several times per year ☐

</div>

18. Please circle the number below that best describes how *comfortable* you feel, in general, when you talk with these acquaintances:

not at all comfortable   1   2   3   4   5   6   7   very comfortable

19. Think about how often you have a conversation with these acquaintances about anything to do with yourself. Please place <u>one</u> tick to indicate how frequently you have a conversation with acquaintances <u>about yourself</u>:

<div style="text-align:right">

never ☐ → Go to the next section
11 or more times per day ☐
6 - 10 times per day ☐
1 - 5 times per day ☐
several times per week ☐
several times per month ☐
several times per year ☐

</div>

20. Please circle the number below that best describes how *comfortable* you feel, in general, when you talk with these acquaintances <u>about yourself</u>:

not at all comfortable   1   2   3   4   5   6   7   very comfortable

For the next few questions, could you please indicate the extent to which certain people know information about you through your telling it or confiding it to them. If you are certain that the specified person knows the information fully - so that he or she could tell someone else accurately about this aspect of you - write the number 1 in the appropriate space. If the other person does not know this information fully - if he or she has only a vague idea, or has an incomplete knowledge of this particular item, write in a 0. Please make sure you answer each question for each of the following five people, if appropriate:

M=Mother   F=Father   MF=Any Male Friend(s)   FF=Any Female Friend(s)   S/P=Spouse/Partner

How fully does <u>each</u> person know the following information through your telling it?
1 = knows this information fully   0 = does not know this information fully

What you like to do most in your spare time at home, e.g. read, sports, go out, etc.

M ___   F ___   MF ___   FF ___   S/P ___

The kind of party or social gathering that you enjoy most.

M ___   F ___   MF ___   FF ___   S/P ___

M=Mother   F=Father   MF=Any Male Friend(s)   FF=Any Female Friend(s)   S/P=Spouse/Partner

Your usual and favourite spare-time reading material, e.g., novels, non-fiction, science fiction, poetry etc.

M __   F __   MF __   FF __   S/P __

The kinds of music that you enjoy listening to most, e.g. popular, classical, folk, opera.

M __   F __   MF __   FF __   S/P __

The sports you engage in most, if any, e.g. golf, swimming, tennis, baseball, etc.

M __   F __   MF __   FF __   S/P __

Whether or not you know and play any card games, e.g. bridge, poker, gin rummy etc.

M __   F __   MF __   FF __   S/P __

Whether or not you will drink alcoholic beverages; if so, your favourite drinks - beer, wine, gin, brandy, whiskey etc.

M __   F __   MF __   FF __   S/P __

The foods you like best, and the ways you like food prepared; e.g. rare steak etc.

M __   F __   MF __   FF __   S/P __

Whether or not you belong to any church; if so, which one, and the usual frequency of attending.

M __   F __   MF __   FF __   S/P __

Whether or not you belong to any clubs, fraternity, civic organisations; if so, the names of these organisations.

M __   F __   MF __   FF __   S/P __

Any skills you have mastered, e.g., arts and crafts, painting, sculpture, woodworking, auto repair, knitting, weaving etc.

M __   F __   MF __   FF __   S/P __

Whether or not you have any favourite spectator sports; if so, what these are, e.g., boxing, wrestling, football, basketball, etc.

M __   F __   MF __   FF __   S/P __

The places that you have travelled to, or lived in during your life - other countries, cities.

M __   F __   MF __   FF __   S/P __

M=Mother   F=Father   MF=Any Male Friend(s)   FF=Any Female Friend(s)   S/P=Spouse/Partner

What your political sentiments are at present - your views on government policies of interest to you.

M __   F __   MF __   FF __   S/P __

Whether or not you have been seriously in love during your life before this year, if so, with whom, what the details were, and the outcome.

M __   F __   MF __   FF __   S/P __

The names of people in your life whose care and happiness you feel in some way directly responsible for.

M __   F __   MF __   FF __   S/P __

The personal deficiencies that you would most like to improve, or that you are struggling to do something about at present, e.g., appearance, lack of knowledge, loneliness, temper, etc.

M __   F __   MF __   FF __   S/P __

Whether or not you presently owe money; if so, how much, and to whom?

M __   F __   MF __   FF __   S/P __

The kind of future you are aiming toward, working for, planning for - both personally and vocationally, e.g. marriage and family, professional status etc.

M __   F __   MF __   FF __   S/P __

Whether or not you are now involved in any projects that you would not want to interrupt at present - either socially, personally, or in your work; what these projects are.

M __   F __   MF __   FF __   S/P __

The details of your sex life up to the present time, including whether or not you have had, or are now having sexual relations, whether or not you masturbate, etc.

M __   F __   MF __   FF __   S/P __

Your problems and worries about your personality, that is, what you dislike most about yourself, any guilts, inferiority feelings, etc.

M __   F __   MF __   FF __   S/P __

How you feel about the appearance of your body - your looks, figure, weight - what you dislike and what you accept in your appearance, and how you wish you might change your looks to improve them.

M __   F __   MF __   FF __   S/P __

Your thoughts about your health, including any problems, worries, or concerns that you might have at present.

M ___   F ___   MF ___   FF ___   S/P ___

An exact idea of your regular income. (If a student, of your usual combined allowance and earning, if any).

M ___   F ___   MF ___   FF ___   S/P ___

Thank you very much for your time & participation!

Appendix E

Paper Reporting Development and Psychometric Properties of the

Speaking Extent and Comfort Scale (SPEACS)

A New Measure of Conversational Experience:
The Speaking Extent and Comfort Scale (SPEACS)
(Manuscript submitted for publication)
Antonia Lyons & John Spicer

Few measures exist which directly assess aspects of conversational experience. We present and provide a psychometric assessment of the Speaking Extent and Comfort Scale (SPEACS), a new 20-item measure which assesses four aspects of past conversational experience: the extent and comfort of both general conversations and conversations specifically about the self. Three of the four SPEACS subscales demonstrated reasonable internal consistency, and all exhibited good test-retest reliability. As predicted, the subscales related positively to social competence, disclosure, assertiveness and perceived availability of someone to talk to, and negatively to social avoidance and social anxiety, providing support for their construct validity. SPEACS offers a range of potential applications in areas with a focus on social networks, social experience and interaction, and the possibility of extension to other dimensions of conversational experience.

Conversation plays a variety of key roles in human experience and conduct. It is fundamental, not only to the creation and maintenance of social roles and connections, but also to the construction of personal identity (Frazer, 1989; Harré, 1991). It also appears to have consistent physiological concomitants such as striking elevations in blood pressure (Lynch, 1985; Tardy, Thompson & Allen, 1989). To study these various phenomena, it is necessary to develop effective ways to capture or, where appropriate, to quantify aspects of conversational experience.

Multiple approaches have been developed to assess aspects of conversational experience. Some are traditional diary techniques, such as the Iowa Communication Record (Duck, Rutt, Hoy Hurst & Strejc, 1991), where respondents recollect and answer questions about one particular conversation each day. Others, such as conversation and discourse analysis (Atkinson & Heritage, 1984; Potter & Wetherell, 1987), are based on radically different theories about social life and its investigation. Although these approaches vary both in method and in their underlying assumptions, they have a common focus on the detailed unfolding of particular conversational episodes within their social context. In the present article we describe a new measure for assessing a less studied feature of conversational experience.

During our work on the immediate effects of conversation on blood pressure, we became interested in the notion of *past* conversational experience as a *resource*. This perspective suggests that the ways in which individuals negotiate the intricacies of a particular conversational episode will be partially determined by the conversational 'history' they bring to the encounter. In particular, we concentrated on the extent of individuals' conversational experience, and on the level of comfort they typically experience during conversation. On this view, a 'resourceful' individual would be one who frequently engages in conversations with a wide range of others, and/or one who finds such encounters comfortable, or at least not a source of discomfort. This need not imply that the resourceful individual is a skilled conversationalist, but only that conversation is a familiar and relatively easy task for him or her. For various theoretical reasons, we were concerned to be able to look at not only general conversational experiences, but also to isolate conversational experiences where people talked about themselves. These interests led to the need for a measure which could assess four aspects of conversation: the extent and comfort level of conversations, both in general and concerning the self in

particular.

In searching a variety of literatures we were unable to locate an appropriate instrument to fully capture these aspects of conversational experience. Although some measures of social support contain elements which provide a crude assessment of some of these features (e.g. the appraisal subscale of the Interpersonal Support Evaluation List, which measures the perception that there is someone available to talk to about one's problems (Cohen & Hoberman, 1983)), it appeared necessary to create a new measure for our particular needs. Our specific purpose was to examine whether past conversational experience moderated the immediate effects of engaging in self-focused conversation on blood pressure. Having developed and tested the Speaking Extent and Comfort Scale (SPEACS), and obtained coherent results in our work, we now believe that this measure may be of use to researchers who are concerned with conversational experience in other research contexts.

In the following, we describe the development of the SPEACS, and provide information regarding its internal consistency and test-retest reliability. The latter was assessed over a three week period with the expectation that SPEACS scores should exhibit a high degree of stability. This expectation was based on the assumption that the overall pattern of an individual's conversational experience should not change quickly under normal circumstances: a conception in line with the general notion of a stable 'resource'. It was further assumed that three weeks was a sufficiently long time for recall of earlier responses on the measure to diminish to acceptable levels.

We also assessed the construct validity of the SPEACS by correlating its subscale scores with those on other measures of social experience. Viewed as a resource brought to social situations, past conversational experience would be expected to relate positively to other social resource constructs, such as social competence and assertiveness. We further expected that these relationships would be stronger for comfort than for extent of conversations. We also expected SPEACS scores to relate positively to those on other measures of conversational experience, such as disclosure and availability of someone to talk to about one's problems. Again, these relationships were expected to be stronger for comfort than for extent of conversations, and in addition, for conversations specifically focused on the self. Finally, we predicted that SPEACS scores, especially on comfort level during conversations, would be related negatively to possible emotional and behavioural consequences of conversational experience, such as social avoidance and social anxiety. While we predicted that the SPEACS would relate to measures of these constructs, we did not expect these relationships to be strong. The aspects of conversational experience targeted by the SPEACS are embedded in social experience, but are clearly distinct from the various constructs mentioned above.

Method

Development of the SPEACS

The first step in constructing this measure was to identify target individuals or groups of people for respondents to consider when thinking about their conversations. The use of specific targets was intended to make the task easier and to allow more precise, reliable and valid estimates of a respondent's extent of conversations, and comfort level during these conversations. (This multiple target approach also creates the potential for finer grain analyses of specific targets, if desirable.) Items were constructed to assess how often the respondent conversed with the target, and how comfortable the respondent felt during these conversations. These items were provided twice, once with respect to conversations in general, and once with respect to conversations specifically about the respondent. Thus, the same set of four questions was asked regarding a range of target people.

Five targets were finally chosen on the basis of respondents' comments in pilot work, in order to provide a wide range of conversational encounters. This work also gave the opportunity to test various wordings of the items to ensure their comprehensibility and usability. We also investigated a range of different response formats. Initially, open responses were used for the frequency items, such that

205

respondents were asked to give one number that indexed how often they typically conversed with a target. The difficulty of this task led to the development of a response scale, initially based on responses that had been provided. The response categories were modified a number of times to elicit sufficient variability in response across respondents, and to obtain categories which respondents could use without undue difficulty. An upper limit of several times per year for conversation frequency was decided on to avoid memory problems and to provide a common time frame for responses. A response scale was also developed for the comfort items, which began as a 5-point scale but which was modified to a 7-point scale to enhance its reliability, and to keep the number of points on the response scales consistent across the frequency and comfort items.

The SPEACS contains 20 items which ask people to consider the frequency of their conversations, and how comfortable they feel during these conversations, with each of five target persons/groups: partner/spouse, best friend, other friends, relatives and acquaintances. Half of the items refer to conversations in general, and half refer to conversations specifically about the self. Written instructions make it clear that once a specific target person is considered in one category, that person should not be considered again in a subsequent category.

For each target person(s), the respondent is asked how frequently s/he has a conversation with that person(s), and also how frequently s/he has a conversation with that person(s) about herself/himself. Seven response categories are available: never/not applicable, several times per year, several times per month, several times per week, 1-5 times per day, 6-10 times per day, 11 or more times per day. These categories are coded from 0 to 6, respectively, and responses are summed to provide an overall frequency of conversation score, with a possible range of scores from 0 to 60. Two further subscales are derived from these frequency items. Responses to the five items referring to frequency of *general* conversations are summed to provide an 'extent of general conversation' score. Similarly, responses to the five items regarding frequency of conversations *about the self* are summed to provide an 'extent of self conversation' score.

In addition, for each target person(s) the respondent is asked how comfortable s/he feels, in general, when conversing with that person(s), and also how comfortable s/he feels, in general, when conversing with that person(s) about herself/himself. Responses are made on a 7 point scale, ranging from 1 (not at all comfortable) to 7 (very comfortable). Unlike the frequency of conversation scales, the comfort scales cannot be treated cumulatively. It is not appropriate to add comfort scores for different targets to provide an overall comfort score. Instead, an overall average comfort score is obtained by computing the mean response to the comfort items with valid responses (some targets are not applicable for all participants, such as partner/spouse). In a similar manner, a score for average comfort level during *general* conversations is computed, and also a score for average comfort level during conversations *about the self*.

Reliability and Validity Assessment

Participants

A total of 400 undergraduate students (76% female) completed a questionnaire containing the SPEACS and various other measures of social experience over three separate data collections. Details of the subsamples and the particular measures completed are provided in Table 1 (see overleaf). Ages of participants ranged from 16 to 82 years, with a mean of 21.75 years (*sd* = 6.17). However, 83% of participants were 23 or younger, as would be expected in an undergraduate sample.

The first sample (A) consisted of 102 female psychology students, who completed the questionnaire as part of a separate study investigating blood pressure reactivity. Questionnaires were completed individually with the researcher nearby in an adjacent room. The second sample (B) was obtained in an undergraduate human resources management course. Questionnaires were given to 38 students, who completed them at home and returned them to the researcher the following week.

To obtain the third sample (C1), undergraduate students were approached in two psychology courses and asked to participate in the study. A further 260 students agreed to take part, and completed a questionnaire in class. Exactly three weeks later, the researcher returned to these two classes and 146 of the participants who had completed the first questionnaire also completed a second questionnaire in class (sample C2).

Table 1: Number of Participants and Measures Included In Each Sample

	Sample			
	A	B	C1	C2
Number of participants	102	38	260	146
Measures				
Speaking Extent and Comfort Scale	o	o	o	o
ISEL⁺ Appraisal Subscale		o	o	
Rating Scale of Social Competence	o	o	o	o
Self-Disclosure Questionnaire	o	o		
Rathus Assertiveness Schedule		o	o	
Social Anxiety Subscale	o	o		
Social Avoidance and Distress Scale		o	o	

⁺Interpersonal Support Evaluation List

Measures Used to Assess Construct Validity

Availability of Someone to Talk To: The appraisal subscale of the Interpersonal Support Evaluation List (ISEL, student version, Cohen & Hoberman, 1983) measures the perceived availability of someone to talk to comfortably about one's problems. This subscale consists of 12 items to which respondents answer 'probably true' or 'probably false'. The appraisal subscale of the ISEL has adequate internal consistency, and the total ISEL measure has demonstrated some convergent and discriminant validity (Cohen & Hoberman, 1983).

Social Competence: The Rating Scale of Social Competence (RSSC; Lewinsohn, Mischel, Chaplin & Barton, 1980) consists of 17 adjectives which respondents endorse on a 7-point scale. Lewinsohn et al. report that this scale has high internal consistency for self-ratings as well as observer ratings.

Disclosure: Jourard's 25-item Self-Disclosure Questionnaire (SDQ) was used to assess self-disclosure. This measure assesses past disclosure behaviour concerning each of 25 topics to 5 target persons: mother or mother figure, father or father figure, male friend, female friend, spouse or partner. Respondents answer whether this person does not know about this topic, or only has a vague idea or whether this person knows this information fully. The SDQ has high internal consistency for target persons (Jourard, 1971).

Assertiveness: The Rathus Assertiveness Schedule was used to measure assertiveness (RAS; Rathus, 1973). This is a 30-item schedule and respondents are asked to indicate how descriptive or characteristic each item is of them on a 6 point scale, ranging from -3 (not at all) to +3 (very). The RAS has been found to have good test-retest reliability and reasonable internal consistency (Rathus, 1973). Some changes were made to the RAS for use in the present study to eliminate sexist language (salesman to salesperson) and make it more appropriate for use in a New Zealand sample. The

instructions were modified to ask the respondent to indicate how well each item describes her/him, and anchor points of the rating scale were changed to range from 1 to 6.

<u>Social Anxiety</u>: The social anxiety subscale of the Self-Consciousness Scale (Fenigstein, Scheier & Buss, 1975) was used to assess social anxiety. This subscale contains 6 statements and respondents are asked to indicate how well each item describes them on a 5 point scale, from 0 (not at all) to 4 (very).

<u>Social Avoidance</u>: The Social Avoidance and Distress Scale (SAD, Watson & Friend, 1969) is a 28-item measure which requires true/false responses. It has high internal reliability and has been found to relate moderately with a fear of negative evaluation scale and the Audience Sensitivity Index (Watson & Friend, 1969).

Results

As the data were collected at different times, in various settings, and with different students, ANOVAs and t-test analyses were carried out to investigate if there were any mean differences between the three samples (A, B, C1) on any of the measures. There were no significant differences on any measure across the three data collections. The relationships between age and sex and the SPEACS subscales were also examined. There was a weak tendency for age to have negative relationships with the extent of total, general and self conversations (rs ranged from = -.14 to -.18, $ps < .01$). No difference was found between males and females in their reported extent of conversations, nor in their comfort level during total or general conversations. A small difference was found between males and females in their comfort level during conversations about themselves, such that females reported feeling more comfortable than males ($t = 2.35$, $p < .05$). As the SPEACS relationships with age and sex were negligible, and there were no differences on any measure across the three samples, the three data sets were pooled (N = 400) for the following analyses.

The means and standard deviations for each SPEACS subscale are provided in Table 2. The standard deviations on the comfort subscales indicate limited variability, although subsequent analyses suggested that this was not a problem. The distributions of all subscales approximated normality.

Table 2: Internal and Test-Retest Reliabilities, Means and Standard Deviations for the SPEACS Subscales

	Internal Consistency		Test-Retest Reliability			
	Alpha	n	r Coefficient	n	Mean	SD
Extent of:						
Total conversations	.69	400	.78*	146	26.87	6.88
General conversations	.22	400	.71*	146	15.32	3.60
Self conversations	.58	400	.79*	146	11.55	3.75
Comfort level during:						
Total conversations	.83	169	.74*	146	5.34	0.77
General conversations	.67	169	.66*	146	5.65	0.74
Self conversations	.70	169	.76*	145	5.03	0.95

* $p < .001$

Reliability

Table 2 also displays the Cronbach's alphas for the SPEACS subscales. Over half of the sample did not have a partner/spouse and therefore did not complete the comfort questions relating to that particular target person. Accordingly, the alphas for the comfort subscales were calculated on the subsample of 169 cases who did have a partner/spouse.

The alpha coefficients were satisfactory, the notable exception being that of .22 for extent of general conversation. (Even when this alpha is recalculated based only on those people with partners, it remains unacceptably low.) Examination of the item response distributions showed a severe skew in the responses to item one. For those people with a partner/spouse, the modal response was 6, the maximum response available. In other words, the majority of people with partners responded that they conversed with them 11 or more times per day. If item one is excluded from this subscale, its alpha increases to .45.

Test-retest coefficients for the SPEACS subscales also appear in Table 2. Over a three week interval the test-retest reliabilities were adequate for the subscales, in that, with one exception, they were all above .7.

Relationships among the SPEACS Subscales

Table 3 shows the correlations among the SPEACS subscales. As would be expected, the general and self subscales correlated highly with their respective total scale scores. The extent of general, and self, conversations both correlated highly with the extent of total conversations. Similarly, average comfort during general conversations, and during self conversations, correlated highly with comfort during total conversations.

Table 3: Relationships Among the SPEACS subscales (N = 400)

	Extent of Conversations		Comfort level during Conversations		
	General	Self	Total	General	Self
Extent of Conversations:					
Total	.93***	.94***	.21***	.19***	.20***
General		.75***	.17***	.19***	.13**
Self			.22***	.16***	.24***
Comfort level during Conversations:					
Total				.91***	.94***
General					.71***

** p < .01   *** p < .001

The correlations of .71 and .75 between type of conversation within the extent and comfort dimensions provide support for delineating general versus self conversations. Extent of conversations and comfort level during those conversations were only weakly related. The extent of total conversations related weakly to comfort during total conversations and similarly, extent of general conversations related weakly to comfort during general conversations. Extent of self conversations and comfort during self conversations correlated a little higher, but this relationship remained weak. These relationships are

209

reassuring and demonstrate that the extent and comfort of conversations are clearly different dimensions.

Construct Validity

Table 4 shows the relationships of the SPEACS extent and comfort subscales with other measures of social experience. All correlations were in the predicted directions. The extent of total conversations had weak, positive relationships with the perception that there is someone available to talk to, social competence, and to a lesser extent, with disclosure and assertiveness. As expected, extent of total conversations had a weak, negative relationship with social avoidance, but its relationship with social anxiety was not statistically significant. Some differential relationships did occur with extent of general and self conversation. Both extent of general conversation and self conversation related to the availability of someone to talk to, social competence and social avoidance, but only extent of self conversation related to disclosure and assertiveness.

Table 4: Relationships Between the SPEACS Subscales and Aspects of Social Experience

	Availability to Talk (n = 288)	Social Competence (n = 383)	Disclosure (n = 125)	Assertive- ness (n = 266)	Social Avoidance (n = 274)	Social Anxiety (n = 140)
Extent of conversations:						
Total	.22***	.22***	.17*	.14*	-.20***	-.12
General	.18***	.18***	.10	.10	-.20***	-.13
Self	.22***	.18***	.21**	.16**	-.18**	-.08
Comfort level during conversations:						
Total	.29***	.31***	.29***	.31***	-.34***	-.24**
General	.29***	.39***	.21**	.28***	-.34***	-.28***
Self	.29***	.33***	.33***	.27***	-.30***	-.19*

* p < .05 ** p < .01 *** p < .001

Average comfort during total conversations was moderately, positively related to the availability of someone to talk to, social competence, disclosure and assertiveness, and negatively related to social avoidance and social anxiety, as expected. Again, some differential relationships were found when type of conversation was looked at. Somewhat surprisingly, social competence, social avoidance and social anxiety were all more strongly related to comfort during general conversations than during self conversations. However, disclosure had a stronger relationship with comfort during self conversations than with comfort during general conversations.

Discussion

These results demonstrate that the SPEACS subscales are reasonably stable over time, and with one exception, have adequate internal consistency. Expectations regarding how the SPEACS would relate to different constructs were supported. All relationships were in the predicted directions, and little variation was found in the strength of relationships across different constructs. Thus, the pattern of relationships found between the SPEACS subscales and other measures of social experience constructs

provides a reassuring demonstration of convergent validity.

As expected, there was a contrast between extent and comfort of conversations, such that comfort level during conversations related more strongly to all other constructs than did extent of conversations. This difference was particularly noticeable for social anxiety, which was related negatively to comfort during conversations, but not to extent of conversations. This may be because anxiety is more similar to comfort, in that they are both concerned with emotional aspects of social situations, whereas extent of conversations is more focused on actual behaviour. However, social avoidance is focused on actual behaviour, yet it also related more strongly to comfort during conversations than to extent of conversations. This pattern could be explained by viewing social avoidance and social anxiety not as consequences of conversational experience, but as helping to shape the experiences of conversational encounters. Thus, social anxiety could be seen as affecting comfort felt during conversations, but not influencing how many conversations actually occur. The tendency for social avoidance, on the other hand, may affect both comfort felt during conversations, as well as how many conversations actually occur.

Relationships between the six social experience constructs and type of conversation (general versus self) were quite similar, although some differences did emerge. It was predicted that disclosure and availability of someone to talk to about problems would be more strongly related to the extent and comfort of self conversations than to conversations in general. Reassuringly, this pattern of relationships was clearly observed for disclosure, and to a lesser extent for availability of someone to talk to. Extent of general conversations failed to relate significantly to three of the six constructs. This may have been due to the problems of internal reliability this subscale demonstrated. Interestingly, social anxiety was more strongly related to comfort level during general conversations than during self conversations. It may be that feeling uncomfortable during general conversations gives more scope for social anxiety, these types of conversations being more pervasive than those focused on the self.

After this promising beginning, there are various ways in which the SPEACS may be developed further. Although the five target groups used in the SPEACS are quite diverse, other targets may also be important, such as 'your child or children'. Conversations with one's children are likely to elicit different answers than conversations with the rest of the family. Including additional target people may be especially important when using the SPEACS in samples that are different from that used in the present study. More fundamentally, the SPEACS assesses only two dimensions of conversational experience. Furthering the notion of assessing a conversational experience 'resource', there are other possible aspects that may be useful to assess, such as competence felt during conversations, the importance/salience of conversations, the availability of target people for conversations, or specific types of conversations (e.g. about work, family etc.). The SPEACS has the potential for further 'resource' dimensions to be added and assessed using the same format. Whether or not the SPEACS is developed further, the data and results presented here are based on a limited sample of young university students, and it clearly would be useful to gain further psychometric data on this measure from different populations.

The SPEACS, even in its present form, appears to have actual and potential utility. As noted earlier, we developed the SPEACS in a research context which focused on the immediate effects of self talk on cardiovascular activity. We found that the difference in blood pressure reactivity across three types of conversations varied significantly according to scores on the SPEACS subscales: some indication of their criterion validity. The SPEACS could also be useful in other areas, especially in those with a focus on social networks, social experience and interaction. Its design also enables finer grain analyses if desired, such as looking at responses for specific targets. Overall, we suggest that the flexibility of the SPEACS as a research instrument, and its reliability and validity as demonstrated here, make it a potentially useful research tool.

References

Atkinson, J. M. & Heritage, J. (Eds.). (1984). *Structures of social action: Studies in conversation analysis.* Cambridge: Cambridge University Press.

Cohen, S. & Hoberman, H. M. (1983). Positive events and social supports as buffers of life change stress. *Journal of Applied Psychology, 13,* 99-125.

Duck, S, Rutt, D. J., Hoy Hurst, M. & Strejc, H. (1991). Some evident truths about conversations in everyday relationships: All communications are not created equal. *Human Communication Research, 18,* 228-267.

Fenigstein, A., Scheier, M. F. & Buss, A. H. (1975). Public and private self-consciousness: Assessment and theory. *Journal of Consulting and Clinical Psychology, 43,* 522-527.

Frazer, E. (1989). Feminist talk and talking about feminism: Teenage girls' discourse of gender. *Oxford Review of Education, 15,* 281-290.

Harré, R. (1991). The discursive production of selves. *Theory and Psychology, 1,* 51-63.

Jourard, S. M. (1971). *Self-disclosure: An experimental analysis of the transparent self.* New York: Wiley.

Lewinsohn, P. M., Mischel, W., Chaplin, W. & Barton, R. (1980). Social competence and depression: The role of illusory self-perceptions. *Journal of Abnormal Psychology, 89,* 203-212.

Lynch, J. J. (1985). *The language of the heart: The body's response to human dialogue.* New York: Basic Books.

Potter, J. & Wetherell, M. (1987). *Discourse and social psychology: Beyond attitudes and behaviour.* London: Sage.

Rathus, S. A. (1973). A 30-item schedule for assessing assertive behaviour. *Behavior Therapy, 4,* 398-406.

Tardy, C. H., Thompson, W. R. & Allen, M. T. (1989). Cardiovascular responses during speech: Does social support mediate the effects of talking on blood pressure? *Journal of Language and Social Psychology, 8,* 271-285.

Watson, D. & Friend, R. (1969). Measurement of social-evaluative anxiety. *Journal of Consulting and Clinical Psychology, 33,* 448-457.

Table F.1: Correlations Between Psychological, Age and Cardiovascular Resting Level Variables

Cardiovascular Resting Levels	Psychological Variables						
	Age	Conversation Extent	Conversation Comfort	Disclosure	Private Self-Cons.[a]	Public Self-Cons.	Social Competence
Based on N	101	101	101	93	100	100	99
SBP	.02	.21*	.16	-.03	-.09	-.19	-.09
DBP	.16	.02	.06	-.18	.01	-.18	-.08
HR	-.10	-.03	.04	-.08	-.04	-.09	.08
MAP	.09	.14	.10	-.06	-.05	-.13	-.11

* $p < .05$
[a] self-cons. = self-consciousness

Table F.2: Correlations Between Psychological, Age and Cardiovascular Reactivity Variables

Reactivity Measure	Age	Conversation Extent	Conversation Comfort	Disclosure	Private Self-Cons.[a]	Public Self-Cons.	Social Competence
Based on N	101	101	101	93	100	100	99
ΔSBP							
Private Self	-.03	.01	-.01	-.01	-.01	-.17	.08
Public Self	.10	.04	.05	-.09	-.08	-.17	-.14
Non-Self	.02	-.01	.08	.01	-.02	-.15	-.07
ΔDBP							
Private Self	-.04	-.08	.06	-.12	-.02	-.11	.11
Public Self	-.02	.11	.22*	.09	-.10	-.16	.06
Non-Self	-.06	-.07	.01	.02	-.11	-.21*	.02
ΔHR							
Private Self	.00	.08	.11	-.02	-.05	-.02	.08
Public Self	-.11	.05	-.03	.04	-.03	-.03	.03
Non-Self	-.09	.03	.03	.00	.02	-.11	-.02
ΔMAP							
Private Self	.06	-.13	-.04	-.06	.11	-.03	-.03
Public Self	-.01	.06	.27**	.08	.08	-.03	.15
Non-Self	.04	-.11	.05	.02	.06	-.17	-.03

* p < .05 ** p < .01
[a] self-cons. = self-consciousness

Table G.1: Linear and Curvilinear Interaction Effect Results of Psychological Variable By Talking Condition on Cardiovascular Reactivity

Reactivity Measure	Wilks' Approximate Multivariate F-Value for Each Psychological Variable					
	Conversation Extent	Conversation Comfort	Disclosure	Private Self-Cons.[a]	Public Self-Cons.	Social Competence
	Linear Interaction Effect Results					
ΔSBP	0.07	0.23	0.33	0.19	0.05	1.66
ΔDBP	1.58	1.71	1.14	0.35	0.30	0.41
ΔHR	0.14	0.99	0.14	0.25	0.41	0.42
ΔMAP	1.32	3.75*	0.61	0.14	0.59	1.28
	Curvilinear Interaction Effect Results					
ΔSBP	0.21	0.26	0.43	1.32	0.16	1.37
ΔDBP	4.40**	1.42	0.88	0.56	0.17	0.39
ΔHR	0.25	0.86	0.21	1.54	0.28	0.31
ΔMAP	0.67	2.93*	0.53	0.71	0.33	0.79

* $p < .05$ ** $p < .01$

[a] self-cons. = self-consciousness

Table G.2: Linear and Curvilinear Interaction Effect Results of Combinations of Psychological Variables By Talking Condition on Cardiovascular Reactivity

Reactivity Measure	Wilks' Approximate Multivariate F-Value for Each Psychological Variable			
	Stable Attributes (self-c. X social comp.)	Social Resources (comfort X social comp.)	Conversing Resources (extent X comfort)	Linguistic Resources (comfort X disclosure)
Linear Interaction Effect Results				
ΔSBP	0.78	1.03	0.05	0.22
ΔDBP	0.46	0.94	2.44	0.96
ΔHR	1.09	0.56	0.73	0.57
ΔMAP	0.56	1.45	3.31*	2.02
Curvilinear Interaction Effect Results				
ΔSBP	0.84	0.77	0.31	0.48
ΔDBP	0.61	1.02	4.18**	1.31
ΔHR	1.28	1.21	0.59	0.42
ΔMAP	0.52	1.20	1.99	1.66

* $p < .05$ ** $p < .01$
self-c = self-consciousness, social comp. = social competence

Table H.1: Multiple Regression Results Showing the Impact of Psychological Variables on Cardiovascular Reactivity Within Each Talking Condition

Regression Analyses		N	Linear Regression Results (Step 1)			Quadratic Regression Results (Step 2)			
Independent Variable	Dependent Variable		A	B	R^2	A	B_1(lin)	B_2(quad)	ΔR^2
Extent of Conversations	ΔDBP Private Self Talk	100	11.941	-.075	.006	27.133	-1.186	.020	.028
	ΔDBP Public Self Talk	101	5.757	.102	.011	-16.643	1.740**	-.029**	.061**
	ΔDBP Non-Self Talk	101	10.121	-.071	.004	13.354	-.307	.004	.001
Comfort Felt During Conversations	ΔMAP Private Self Talk	101	12.588	-.382	.002	-1.429	5.034	-.513	.005
	ΔMAP Public Self Talk	101	-4.302	2.519**	.072**	-11.211	5.188	-.253	.001
	ΔMAP Non-Self Talk	101	5.654	.422	.003	32.953	-10.126	1.00	.021

* p < .05   ** p < .01

Regression Analyses		Linear Regression Results (Step 1)			Quadratic Regression Results (Step 2)			
Independent Variable	Dependent Variable	A	B	R^2	A	B_1(lin)	B_2(quad)	ΔR^2
At Low Levels of Conversing Extent (N = 33)								
Comfort Felt During	ΔMAP Private Self Talk	20.142	-1.641	.075	16.583	-.210	-.140	.001
Conversations	ΔMAP Public Self Talk	-4.814	2.537	.081	12.728	-4.512	.688	.010
	ΔMAP Non-Self Talk	10.254	-.251	.001	59.870	-20.189	1.945	.109
	ΔDBP Private Self Talk	12.290	-.274	.003	9.184	.974	-.122	.001
	ΔDBP Public Self Talk	2.513	.916	.018	39.580	-13.979	1.453	.077
	ΔDBP Non-Self Talk	16.425	-1.534	.035	34.721	-8.886	.717	.013
At Medium Levels of Conversing Extent (N = 33)								
Comfort Felt During	ΔMAP Private Self Talk	4.615	1.253	.014	-45.698	20.961	-1.896	.032
Conversations	ΔMAP Public Self Talk	-12.768	4.216*	.140*	-32.153	11.809	-.730	.004
	ΔMAP Non-Self Talk	-5.752	2.663	.117	-32.656	13.202	-1.014	.017
	ΔDBP Private Self Talk	9.393	-.010	.000	-27.243	14.348	-1.381	.031
	ΔDBP Public Self Talk	-6.698	3.001	.107	-16.207	6.726	-.358	.002
	ΔDBP Non-Self Talk	5.855	.646	.008	4.559	1.154	-.049	.000
At High Levels of Conversing Extent (N = 36)								
Comfort Felt During	ΔMAP Private Self Talk	10.050	-.139	.000	-11.509	7.773	-.715	.004
Conversations	ΔMAP Public Self Talk	3.517	1.080	.018	-22.357	10.576	-.858	.009
	ΔMAP Non-Self Talk	10.897	-.758	.009	76.242	-24.740	2.167	.055
	ΔDBP Private Self Talk	1.700	1.435	.022	-12.478	6.638	-.470	.002
	ΔDBP Public Self Talk	-1.244	1.851	.070	-80.339	30.879*	-2.623	.105
	ΔDBP Non-Self Talk	-3.818	2.039	.043	58.974	-21.005	2.082	.034

* p < .05

2