

The Effects of Shared Reality on Emotional Experience and
Regulation

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ABSTRACT

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The current study consisted of a pilot and two experiments that explored the effects of “shared reality”—experiencing commonality with others’ inner states about some aspect of the world—on clinically relevant emotional processes, such as emotional regulation, attachment, well-being, and positive and negative affects. The primary aim was to contribute to our understanding of the implications of social sharing on emotional experience and regulation, using the well-established paradigm of shared reality. Shared reality has been studied thus far in connection to social-cognitive processes such as memory and attribution. The current study is the first application of this paradigm to emotional research.

The study showed that shared reality intensifies negative emotional reactions, but not ambiguous ones. In addition, the study showed that shared reality makes people feel less guilty and fearful, but failed to show that it increases secure attachment to others. The study suggests that shared reality operates by making aspects of perceived reality seem more relevant and thus, it is argued, more accessible. Implications of the findings to emotional research and clinical practice, as well as its limitations and possible future directions for research, are discussed.

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CHAPTER I: INTRODUCTION

“The awful thing is that beauty is mysterious as well as terrible. God and the devil are fighting there and the battlefield is the heart of man.”

Fyodor Dostoyevsky, *Brothers Karamazov*

Aim of the Study

The primary aim of the current research is to investigate further the relational and interpersonal aspects of social sharing. More specifically, the studies that are part of this research investigate a particular experimental situation deemed “shared reality”—experiencing commonality with others’ inner states about some aspect of the world (Hardin & Higgins, 1996; Higgins, 1992). This research (two studies and a pilot) examines the effects of shared reality on several aspects of emotional experience and regulation, including intensity of feeling, attachment, and experienced positive and negative affects.

Theoretical, Research Background and Rationale of Study

One of the main questions concerning human motivation has been whether humankind is innately good or innately bad—in other words, prone to love or aggression, or God-like or devil-like. Since Freud, however, many psychologists have reformulated this question by postulating that the battle is not between good and bad, but between animal-like seeking of pleasure and rational renunciation of it (Higgins & Pittman, 2008). To Freud and like-minded others, the (partial) resolution of this conflict is the basis of modern civilization and the human ability to live together as a group (Freud, 1930).

The animal-like view of human motivation dominated psychoanalytic literature (Mitchell, 1993; Mitchell & Black, 1996) and experimental psychology (Higgins, 2012; Higgins & Pittman, 2008) throughout much of the early 20th century, leading Higgins and Pittman (2008) to assert that psychologists historically viewed “humans as having the mind of a God and the motives of a brute” (p. 363). In psychoanalysis this perception of human motivation began to shift in the 1940’s with the advent of what has been called object-relations theory. This model emphasizes the need to connect to others, with most theorists of this tradition replacing the animal-like aggressive and sexual drives with the drive to connect with others as the central human motivation (Greenberg & Mitchell, 1983; Kernberg, 2004), and more recently a drive to create meaning in life through interactions with others (Mitchell, 1993; Mitchell & Aron, 1999).

In experimental psychology, recent decades have seen a somewhat similar shift to psychoanalysis with theorists and researchers in this field emphasizing the human need to belong (Baumeister & Leary, 1995), understand oneself and others (Lieberman, 2007), and comprehend, manage, and share inner states (Higgins & Pittman, 2008). From this perspective, sharing inner states—beliefs, goals, thoughts, and feelings—with others is a powerful human need that is present from childhood and in the absence of which humans experience significant psychological and at times even physical discomfort and distress (Fonagy & Target, 1997; Higgins & Pittman, 2008; Linehan, 1993; Mikulincer & Shaver, 2010).

The contemporary emphasis on relational and interpersonal aspects of human motivation and psychological development has affected clinical theory and

research as well. Concepts such as attachment (e.g., Bowlby, 1969; Mikulincer & Shaver, 2010), validation of internal emotional experience (e.g., Linehan, 1993), and attunement to emotional experience (e.g., Schore, 2009; Stern, Hofer, Haft, & Dore, 1985) have been proposed to be essential to healthy human development and have been central to modern conceptualization of psychotherapy process and change. In addition, psychotherapy research has been emphasizing the therapeutic alliance and the relationship between the therapist and patient (e.g., Horvath, 2000, Horvath & Bedi, 2002) as essential mechanisms of change.

Despite this emphasis, many facets of emotional experience and regulation that are interpersonal in nature (for example, the effect of sharing one's emotions on one's stress and arousal; Rime, 2009) remain obscure. Moreover, the experimental exploration of the relational and interpersonal aspects of emotional experience and regulation seems to be the realm of social rather than clinical psychology (Fischer, Manstead, & Zaalberg, 2003; Rime, 2009). The aim of the current research, therefore, is to expand our understanding of relational aspects of emotional experience and regulation by focusing on one relevant and well-studied concept from the social psychology paradigm, that of "shared reality" (Hardin & Higgins, 1996; Higgins, 1992), and applying it to the study of clinical themes that are relevant to emotional experience and regulation, such as intensity of feeling and well-being.

Two experiments and a pilot were designed for the purposes of the current research. Both experiments introduced a novel experimental design where participants shared their perceptions of emotional stimuli, shared reality was manipulated, and its effects on multiple emotional processes was empirically

examined. An additional and broader aspiration of this research was to combine two fields that usually exist in separation: social and clinical psychology. The pilot and the first study were more exploratory in nature. They did not follow specific hypotheses and examined, together, a basic effect of shared reality on perceived intensity of emotions. Study 2 built upon the experimental paradigm of the pilot and study 1, was more comprehensive, and examined several hypotheses regarding the effects of shared reality on multiple emotional variables.

The idea that sharing one's distress with another alleviates distress seems to be one of the cornerstones of psychotherapy. Frequently, psychotherapists encourage their patients to share their emotions, presuming that it will reduce their suffering. But what exactly does the act of sharing achieve? And how does it operate? Perhaps surprisingly, the experimental evidence for the usefulness of sharing is rather mixed (Rime, 2009). For example, although it has been shown that disclosing and sharing emotions has positive psychological, social, and health consequences (Pennebaker & Seagal, 1999; Pennebaker, Zech, & Rime, 2001), some authors suggested that there is no consistent empirical support for the notion that putting an emotional experience into words can alleviate the distress or change the memory associated to it (Rime, 2009), that self-disclosure of patients in psychotherapy has necessarily positive outcomes (Farber, 2006), or that "venting"—expressing negative emotions such as anger or sadness to others—leads to relief (Kennedy-Moore & Watson, 1999). Thus, further empirical study of the effects of social sharing on emotional experience and regulation seems necessary.

Despite the lack of consensus in the literature regarding the specific *effects* of social sharing on immediate emotional experience (Rime, 2009), research in social psychology has begun to identify the motives for sharing. The need to share is hypothesized to stem from two main motives: epistemic and relational (Echterhoff, Higgins, & Levine, 2009). The *Epistemic Motive* refers to the need to achieve a valid and reliable understanding of the world, particularly the social world (Hardin & Higgins, 1996) and establish what is real (Higgins, 1992; Higgins, 2012). The *Relational Motive* refers to the need to feel connected to others (Baumeister & Leary, 1995; Hardin & Higgins, 1996; Pinel, Long, Landau, Alexander, & Pyszczynski, 2006). Thus, social sharing allows humans to both experience a more valid and reliable view of the world and to feel more connected to others.

The current research is the first empirical exploration of the effects of shared reality on different aspects of emotional regulation and experience and it proposes an initial conception of the effects of shared reality on these aspects. In addition, and taking into account the findings regarding the motives for sharing, the study also proposes a possible mechanism of operation of shared reality that is derived from the empirical findings that will be described.

While social sharing is a fundamental and ubiquitous human activity, a particular paradigm of sharing was proposed by Higgins and colleagues and has been termed shared reality—experiencing commonality with others' inner states about some aspect of the world. An example of shared reality is the experience that one's feelings about a third person converge with the feelings of one or more others regarding that person (Hardin & Higgins, 1996; Higgins, 1992; for a recent review of

the concept see Echterhoff et al., 2009). Shared reality has been studied thus far predominantly in what has been known as the “communication game:” (Higgins, 1992) in which sharing reality with others affects the way people communicate to others (tuning their messages to audience’s perceived attitudes) and the way they remember their communication, leading to the “saying-is-believing effect” (people remember what they communicated, not what they initially learned; Higgins & Rholes, 1978). Despite the apparent emotional implications of the concept and despite similarities to clinical and psychoanalytical study of the phenomenon of sharing, shared reality has not been studied yet in relation to emotional experience. The current study attempts to fill this gap and seeks to understand the psychological mechanism of social sharing and its effect on emotional experience and regulation.

CHAPTER II: LITERATURE REVIEW

Sharing and relational aspects of emotional experience and regulation

The second half of the 20th century has brought a gradual shift in the understanding of human motivation and etiology of psychological disorders in clinical literature. In psychoanalysis, the field has been slowly moving away from the Freudian animalistic, destructive view of human motivation to views that emphasize the need for attachment to others (Bowlby, 1969) and relationships to significant others that, through internalization from childhood, provide the basis for psychological health (moving from a conflict model of pathology to a deficit model of pathology; for a review of this shift see Greenberg & Mitchell, 1983; Mitchell & Black, 1996). The debate whether the Freudian animalistic, unconscious “drives” or the need for connection to and internalization of others is the primary source of human motivation and the central cause of pathology (because of conflict in Freud; or deficit in later approaches) is still ongoing in the psychoanalytic literature (Greenberg & Mitchell, 1983; Kernberg, 2004; Levenson, 2010). However, contemporary clinical theory and research, both inside and outside of the psychoanalytic tradition, has been shifting towards the latter view that promotes connection and attachment (Mitchell & Black, 1996; Porges, 2011; Schore, 2009).

Several lines of research and theory have contributed to this shift. I will first mention them briefly here and will then discuss some of them in more detail. First, ever since Bowlby’s (1969) introduction of the concept of attachment, empirical research of infants, especially in a dyadic context of infant-parent, has provided support for the importance of healthy attachments and parental validation of the

infant's inner experience for the child's ability to regulate emotions, understand the world, and be psychologically healthy (Beebe, Knoblauch, Rustin, & Sorter, 2005; Fonagy, 2001, 2003; Main, Hesse, & Kaplan, 2005; Stern, 2000).

Second, neuropsychological research in recent decades, through identification of specific regions and mechanisms in the brain, has emphasized the primacy of the interpersonal and social life to the development of the human ability to understand the world and function in it. Mechanisms that promote social engagement (e.g., Porges, 2011), mutual affect regulation (e.g., Schore, 2009), imitation, association of emotion with imitation in children, and development of empathy (e.g., "mirror neurons" research, see Gallese, 2003, 2005; Rizzolati & Arbib, 1998), children's play and its effect on the cortex, programming it to become "fully social" (e.g., Panksepp, 2009), chronic emotional invalidation and its effect on the brain, causing psychopathology and trauma (e.g., Bromberg, 1998; Herman, 1992; van der Kolk 2004), have all recently been introduced and described. In general, neuroscientific research has generated a body of research that expanded our understanding of the primacy of social engagement, social sharing, and the seeking of emotional validation and empathy as motivators of human behavior and prerequisites for psychological health.

Third, the etiology of many psychological disorders is now understood in the interpersonal context, rather than in the intrapsychic context (as it was in the Freudian tradition or more recently in the cognitive tradition; see Beck, 1972). Borderline personality disorder (e.g., Linehan, 1993; Linehan & Dexter-Mazza, 2008), depression (e.g., Bleiberg & Markowitz, 2008; Panksepp, 2009; Weissman,

Markowitz, & Klerman, 2000), and some forms of psychological trauma (e.g., Bromberg, 1998; Herman, 1992; Schore, 2001), are among the disorders that are now understood by many researchers as consequences of severe social deprivation and invalidation.

Fourth, psychotherapy research has shifted the focus of change in therapeutic work from insight and cognitive change to relational aspects, such as the alliance between the patient and therapist (e.g., Horvath & Bedi, 2002; Wampold, 2001), mutual affect regulation between therapist and patient (e.g., Schore 2009), alliance rupture and repair (Safran & Muran, 2003), dyadic co-creation of meaning and expansion of consciousness (Mitchell, 1993; Tronick, 2009), and attunement and validation of inner states (Stern, 2000, 2004).

Contemporary developmental, clinical, and neuroscientific research and theory emphasize attachment and secure connection to significant others from early age as the central requisite for psychological health and functioning, rich emotional experience, and the ability to regulate one's emotions. The connection to others is established through many social mechanisms, among them social sharing. A child that is not able to share his experience with his caregivers, his emotional reaction to the world is invalidated, and does not feel understood by his caregivers, is in risk for developing various forms of psychopathology, may be lacking the ability to reflect on the world and himself, and lacking the ability to regulate his emotional states (Fonagy & Target, 1997; Fonagy et al., 2003, Linehan, 1993; Stern, 2000, 2004).

Increasingly, the origin of the human mind has been seen as dyadic and dialogic (see Beebe et al., 2005). From the preverbal correspondences, imitations,

and matching of the newborn and caregiver, to explicit verbal sharing of his experience, representation of others' behaviors, and others' reflections on his own behaviors and inner states, the child is developing what some researchers call a "shared mind," a mind that cannot be separated from the intersubjective context in which it develops (Beebe et al., 2005; also see Stern, 2000). One of the central concepts in this line of research has been "affective attunement" (Stern et al., 1985; Stern, 2000), which emphasizes the importance of the caregiver's ability for cross-modal attunement, i.e., the caregiver's ability to infer and match an inner state of the child (not only his overt behavior), thus making the inner state the referent of the attunement, rather than the overt behavior. For example, the mother's ability to infer that the child is sad, despite him not crying, and her ability to affectively match the sadness, by facial expressions (and at a later stage, verbalize it as an act of regulation). In Stern's view, affective attunement provides the bridge between the presymbolic mind and the symbolic mind. Experiences that are attuned to become the experiences that the child shares and that are validated; those that do not, become, potentially, experiences of "not-me" and are not integrated to the self (see Beebe et al., 2005, p. 67). Chronic failure in affect attunement by the caregiver creates psychological pain for the child, deficiency in the sense of self, and inability to self-regulate and self-reflect (Stern et al., 1985; Stern, 2000).

Developmental research in psychology influenced contemporary therapeutic approaches that have gradually begun emphasizing the mutuality in the creation of meaning between therapist and patient, and in the process of regulating the patient's emotions. In therapy, as in development, the goal for many theorists and

researchers became the facilitation of mutual “meaning making”—that is, understanding the world and oneself in a deeper, richer way as a result of the therapist’s (or the mother’s) provision of an environment in which the patient can easily share his inner states and they can be validated (Fonagy, 2001; Fonagy & Target, 1997; Linehan, 1993). Tronick (2009, p. 88) writes:

Successful meaning making carries with it a sense of expansion and positive affects; these feelings...(are) perhaps leading to a feeling of exuberance and aliveness, or an oceanic feeling of wellness. When successful meaning is made with another person, a feeling of connection and synchrony emerges, a mutual sense of being together in a special state. Failure to evoke meaning generates negative affects, fearfulness, anxiety, and a constriction and shrinking.

Linehan (1993; Linehan & Dexter-Mazza, 2008) in her study of borderline personality disorder, has emphasized the importance of “invalidating environments” to the development of the disorder. In her theory, the invalidating environment is defined by “its tendency to negate, punish, and/or respond erratically and inappropriately to private experiences, independent of the validity of the actual behavior” (Linehan & Dexter-Mazza, 2008, p. 373). In such environments communication and sharing of private experiences and self-generated behaviors are indiscriminately rejected and emotional displays sometimes punished. An individual growing up in such an environment may never learn how to label and regulate emotions, may not develop a coherent sense of self and stable identity, and may

mistrust internal states and be dependent on others to understand how to act, think, and feel.

The idea that there are pathological consequences of environments that do not enable the child to securely share his or her inner experiences with a caregiver is echoed by many developmental and clinical researchers, (for a review see Beebe, et al., 2005). Fonagy (Fonagy, 2001; Fonagy & Target, 1997) stresses the importance of secure attachment for the infant's ability to develop theory of mind and reflective function (which he terms mentalization). In his definition, the reflective function is the ability to represent behavior in terms of mental states and is a key determinant of self-organization, which is acquired in early social relationships (recall Higgins & Pittman's, 2008 description of the human motivation to comprehend, manage, and share inner states). The reflective function allows children to react not only to others' behaviors, but also to their beliefs, plans, and hopes, and enables them to "read" others' minds. By doing so, others' and one's own behaviors become meaningful and predictable, as opposed to erratic and uncomprehensible (Fonagy & Target, 1997). In the absence of a caregiver that facilitates self-reflection by labeling the child's emotions, communicating an understanding of his or her inner states, and allowing him or her to express and share inner states, the reflective function will not develop fully, which might lead to a deficient sense of self, inability to form social relations, and chronic inability to regulate one's emotions.

The research reviewed in this section represents a reaction in the clinical field to the historic dominance of either the Freudian tradition or the cognitive tradition (see Ryan, 2007 for a discussion of the "paradigm shift" in psychology from

cognitive dominance to emphasis on motivation and emotion in psychology). As mentioned, in part, this shift has consisted of focusing on interpersonal aspects of human development and motivation, but another significant part has been the focus, noted earlier, on emotional experience. Some clinical researchers have gone as far as suggesting that therapy is not the “talking cure“ but the “affect regulation cure“ (Schoore, 2009). The current clinical emphasis is on the relational aspects of development and pathology, such as the effects of attachment and validation on psychological development, but also, and increasingly, on the emotional experience itself. According to some theorists and researchers for an enduring change as a result of psychotherapy to occur it is not sufficient to alter problematic cognitions of patients or provide insight, but also to focus on (at times, preverbal) emotional contents and their mutual regulation in the context of a safe, validating therapeutic environment in which the patient is attuned to and is able to share inner experiences (Fonagy & Target, 1997; Linehan & Dexter-Mazza, 2008; Ryan, 2007; Schoore, 2009).

Despite the consensus on the long-term benefits of safe, validated sharing on all aspects of psychological health, the immediate effects of sharing on emotional experience and regulation are not clear (Kennedy-Moore & Watson, 1999; Rime, 2009). For example, Farber (2006) concludes that the literature on the outcomes of patients’ self-disclosure in psychotherapy is inconsistent and argues that it can cause either distress or relief, with the different outcome contingent upon multiple variables, such as patients’ characteristic manner of coping with stress (e.g., sensitizing vs. repressing personal information). This gap and inconsistency in the

literature prompted the current research in an attempt to investigate the effects of social sharing on clinically relevant aspects of emotional experience and regulation. One experimental paradigm, shared reality (Higgins, 1992), was chosen as it can provide a rigorous empirical test of the effects of social sharing on emotional processes.

The following part reviews the concept of shared reality and the literature associated with it. As mentioned, shared reality has not been studied yet in connection to emotional processes; hence, the literature review will focus on what we know about this concept in general and will describe the experimental components of the concept that were considered when designing the current experiments.

Shared Reality

The concept of shared reality was introduced by Higgins (1992) as an explanation and expansion of the previously established “saying-is-believing” effect (Higgins & Rholes, 1978). In the initial saying-is-believing study participants read a short essay about a target person and then communicated about him (without using his name) to an audience. The essay included evaluatively ambiguous behavioral descriptions of the target that were characterized by both positive and negative traits. For example, one of the ambiguous descriptions was “independent/aloof.” In this description, the target was presented as having limited contact with others, which could be interpreted as either a sign of being independent and self-reliant or as a sign of being aloof and a “loner.” The participants were told that the audience’s task was to identify the target based on their message description of him.

Before communicating the message, the participants were informed by the research confederate (off-handedly and presumably with no relation to the task) that the audience either liked or disliked the target. This information led to message tuning: the participants produced a more positive message if they believed that the audience liked the target and a more negative one if they believed that they did not like him. Perhaps even more strikingly, the participants also “tuned” their memories: when they were asked to recall the information about the target (even weeks later) their recall was evaluatively biased in the direction of their message and they remembered what they communicated (more positive or more negative message) and not what they learned (an ambiguous message). Several studies replicated this effect on communication and memory (Higgins & McCann, 1984; Higgins, McCann, & Fondacaro, 1982; Sedikides, 1990; Todorov, 2002; for a review see Echterhoff, Higgins, & Groll, 2005). The basic paradigm of the saying-is-believing study—a communicator that produces a message to an audience about a target after learning about their attitude towards the target—has remained the central experimental paradigm in studying shared reality effects and has been modified over the years to distinguish the effect from similar effects and to understand the conditions under which it succeeds or fails. These conditions will be discussed later in this review.

Focusing on the interpersonal dimensions in the construction of reality in the saying-is-believing effect, Higgins (1992) proposed that the effect involved in the creation of a shared reality between the communicator and the audience is an experience of commonality between the inner attitude of the communicator and the

audience about the target person. Producing and sharing a message that was congruent with the inner attitude of the audience about the target created new knowledge for the communicator (i.e., the target person has positive/negative traits), which was remembered by the communicator and experienced as a reliable and valid account of the target. An implicit goal of the communicator (i.e., a goal he or she is not aware of) in the communication was to create shared reality with the audience, an action that influenced and created meaning.

Later studies showed that a failure in the creation of shared reality eliminates the saying-is-believing effect. For example, Echerhoff et al. (2005) showed that participants did not exhibit biased memories after producing a biased message to the audience, if the audience failed to recognize the target and thus failed in creation of shared reality with the communicator. Higgins (1992) argued that the creation of shared reality in the saying-is-believing effect represents a basic human objective in social interaction of creating a common 'social reality,' a reality that is constructed through interpersonal interactions (Asch, 1952; Festinger, 1950; Sherif, 1936). Social reality shapes human beliefs and opinions about the world, since humans tend to construct them based on the beliefs and opinions of others and not on physical reality or hard facts (Festinger, 1950). In the saying-is-believing paradigm the evaluatively ambiguous nature of the target is especially conducive to the creation of social reality in which the opinion about the target is shaped by the presumed opinion of the audience. Thus, the shared reality becomes *the* reality:

...when communicators achieve 'shared reality' with their audience about a target person, this 'shared reality' is likely to be treated *as reality*

especially when the representation of the stimulus input, i.e., the physical reality, has decayed or become inaccessible. (Higgins, 1992, p. 119).

Participants in shared reality studies have not yet formed an evaluative attitude towards the ambiguous target when learning about their audience's attitude (Echterhoff et al., 2005, 2009). Thus, the process of creating a shared reality in the saying-is-believing paradigm is a process in which the communicators construct a view of the target using interpersonal information and the reality they construct is a social reality. In addition, Hardin and Higgins (1996) hypothesized that shared reality fostered interpersonal trust and reliance on others, since it involved trusting another's views of the world, thus promoting the relational dimension of social sharing (Echterhoff et al., 2005, 2009).

In a recent review Echterhoff et al. (2009) identified four necessary conditions for the creation of shared reality and reviewed the theoretical and empirical evidence for these conditions. Failure to achieve any of these four conditions leads to failure in achieving shared reality, making the situation a different type of social interaction and sharing, not shared reality.

The first condition is the commonality of inner states. Echterhoff et al. (2009) argue that in order for a social situation to be a shared reality the participants need to experience commonality of their inner states (beliefs, judgments, feelings) and not just their observable, overt behaviors. They need to believe that the other person perceives some aspect of the world (an individual, political party, painting) similarly to them. In the saying-is-believing paradigm that would usually entail perceiving commonality regarding liking or disliking a target person. Similarity in

overt behaviors (such as mimicking) can suggest very different inner states; it is suggested that inner states can mediate overt behavior, and human recognition of these mediations is a powerful motive (Higgins & Pittman, 2008) and a prerequisite to the creation of shared reality. Several studies showed that even if communicators tune their messages to the audience (i.e., exhibit a common overt perception of the target) the saying-is-believing effect disappears if they do not experience commonality between their and their audience's inner state. For example, Echterhoff, Higgins, Kopietz, & Groll (2008) showed that when communicators were blatantly instructed to take their audience's attitudes towards the target person into account (as opposed to the usual off-handed mentioning of the attitude) the saying-is-believing effect was also eliminated.

Second, the authors argue that shared reality is *about* something, which implies a target referent, an aspect of the world. As mentioned, in the saying-is-believing paradigm it is usually a target person. However, and based on this theory, it can be any aspect of the world that individuals can experience in a converging manner. The objects of reality that are shared can be in the present (popular actor) past (legendary football game) or future (a couple imagining how much both of them will enjoy their mutual child; Higgins & Pittman, 2008). This condition has not been studied as extensively and was not manipulated directly so far, but rather inferred theoretically (see Higgins, 1992; Hardin & Higgins, 1996). However, it received empirical support in at least one study. Echterhoff et al. (2008) showed that when communicators were instructed to tune their messages in an exaggerated manner for the sake of their audience entertainment, the communicators did not

perceive their messages as a valid representation of the target and the saying-is-believing effect disappeared. Thus, the “aboutness” condition was eliminated by purposeful exaggeration of the target.

Third, the motivation for the creation of shared reality is as important as the end-goal of establishing shared reality itself. Echterhoff et al. (2009) identify two main motives for the creation of shared reality: an epistemic motive (establishing a valid and reliable representation of the world) and a relational motive (connecting to others; for a review of these motives see Bar-Tal, 2000 and Hardin & Higgins, 1996). If an individual adopts another person’s inner state about an object in the world, but this process is driven by “external,” instrumental motives (such as being liked by someone or taking another’s perspective for the sake of argument), the ensuing social sharing and interaction is not shared reality. Several studies confirmed and clarified this condition. For example, Kopietz et al. (2010; experiment 1) showed that when communicators simply followed a blatant demand in tuning their messages (thus, making the motivation explicit) the saying-is-believing effect disappeared. It was also shown that communicators did not exhibit the saying-is-believing effect when communicating to a person they were not motivated to share their inner state with (Echterhoff et al., 2005, Experiment 2; Echterhoff et al., 2008, Experiment 1; Kopietz et al., 2010) such as an out-group audience (Turkish student in a German university, trainee in vocational school vs. student in a university, or higher status person, see Echterhoff et al., 2005, 2008; Echterhoff et al., 2009). Regarding the relational motive for the creation of shared reality, Pinel et al. (2006)

showed that the effect of sharing inner states on participants' liking of their sharing partners was larger when the participants' need for connectedness was higher.

Fourth, shared reality must involve a subjective experience of commonality with other's inner state, i.e., the person must be aware that he *succeeded* in establishing a commonality with someone else's inner state about some aspect in the world. This condition emphasizes the subjective experience in creating shared reality. Following from this condition, shared reality can be established even if both sharers are objectively wrong. What matters is that both perceive a commonality, the same subjective perception of the object they share reality about.¹ This condition has been considered as the most straight-forward to manipulate experimentally and also received significant empirical evidence (Echterhoff et al., 2009). For example, it was shown that when the audience does not identify the target based on the message of the communicator, the saying-is-believing effect disappears (Hausmann et al., 2008; Echerhoff et al., 2005). In the initial saying-is-believing study (Higgins & Rholes, 1978) communicators that did not produce a message at all (and thus did not create shared reality through interpersonal communication with the audience) did not exhibit the saying-is-believing effect.

Although interpersonal communication is not necessary for the creation of shared reality (awareness of someone else's inner state could be enough) most of the empirical research about shared reality so far, stemming from the saying-is-believing paradigm, has focused on interpersonal communication (Echterhoff et al.,

¹ Recall the discussion of Stern's et al. (1985) concept of "affective attunement" in the previous section and the apparent similarity between it and the fourth condition for the creation of shared reality (i.e. the emphasis on the subjective experience of commonality of affective states between caregiver and infant).

2009). Ever since the initial saying-is-believing experiment (Higgins & Rholes, 1978), and especially in the last two decades since the formulation of the saying-is-believing effect as an event of shared reality (Higgins, 1992), there has been extensive empirical evidence regarding the mechanism of shared reality and the four necessary abovementioned conditions for it. The two experiments in the current research followed all four conditions, albeit with some novelties in operationalization and design.

Related concepts to Shared Reality

The final part of this review of the literature on shared reality addresses several related concepts and the ways in which they differ from shared reality. For purposes of this research, it is important to distinguish between shared reality and empathy and mood contagion. In empathy (de Vignemont & Singer, 2006; de Waal, 2008; Gallese, 2003) and mood contagion (Hatfield, Cacioppo, & Rapson, 1994; Neumann & Strack, 2000), similarly to shared reality, people share others' inner states and subjectively experience a commonality between theirs and others' inner states. However, this commonality does not necessarily involve an object or a target referent (the phenomena of empathy or mood contagion does not require such object or target), thus not satisfying the second condition for the creation of shared reality. For example, one can empathize with another person following that person's loss; what would be shared in that example is a feeling of sadness, not the target of that sadness (only one person's loss). Echterhoff et al. (2009) argue that both concepts, because of their importance for social sharing, can be considered as building blocks for shared reality. In addition, the authors argue that empathy and

mood contagion can be regarded as dyadic constellations (between person A and person B), while shared reality is a triadic one (person A, person B, target referent).

Shared reality is also different from perspective taking and theory of mind. Although perspective taking satisfies the “aboutness” condition for shared reality, it does not satisfy the appropriate motivation condition and does not entail experiencing the commonality of inner states. Theory of mind is an important developmental human achievement (Higgins & Pittman, 2008; Premack & Woodruff, 1978) that enables humans to understand others and predict their behavior; however, it does not presume necessarily experiencing a commonality between the understood inner states. Both concepts (perspective taking and theory of mind), similarly to empathy and mood contagion, could be considered as building blocks for the creation of shared reality and the ability of humans to socially share.

Summary of relevant research and literature

In summary: on the one hand, contemporary clinical research and theory has emphasized the relational, interpersonal aspects of emotional experience and regulation; on the other hand, the empirical exploration of such elements, and in particular the effects of social sharing on emotional processes, seems to be lacking. In addition, there is no consensus in the literature regarding the effects of social sharing on emotional processes. The concept of shared reality seemed especially apt for filling this gap while being used as a an experimental paradigm to study it in the current research.

CHAPTER III: SHARED REALITY AND EMOTIONAL EXPERIENCE AND REGULATION:
A PILOT STUDY AND TWO SUBSEQUENT STUDIES

The purpose of the current research is to contribute to our understanding of the implications of social sharing on emotional experience and regulation, using the well-established paradigm of shared reality. For that purpose, two experiments were designed to investigate the effects of shared reality on emotional experience and regulation. Taken together, these studies may contribute to our understanding of shared reality and its general mechanism, as well as to a more specific understanding of its effects on the emotional aspects of this situation. These studies may also contribute more generally to our understanding of relational/interpersonal processes in emotional experience and regulation.

The pilot and study 1 examined the most basic emotional regulation aspect—perceived intensity of emotional experience. The pilot is an expansion of an existing emotional regulation paradigm—labeling; study 1 adds to this paradigm a shared reality condition and serves as an exploratory study of shared reality in the context of emotional processes, as will be discussed. Study 2 is more comprehensive, and is focusing on the effects of shared reality on multiple aspects of emotional experience and regulation, such as intensity of feeling, attachment, positive and negative affective attributions, and well-being, and the mechanisms through which it operates.

Pilot Study: Affect Labeling

Method

Overview

Although the expression “putting feelings into words” was coined by Freud (Breuer & Freud, 1893) as a general depiction of his early psychotherapeutic efforts in the treatment of hysteria, the current, experimental, reference is attributed to Lieberman (Lieberman, Eisenberger, Crockett, Tom, Pfeifer, & Way, 2007; Lieberman, Inagaki, Tabibnia, & Crockett, 2011). Lieberman and his colleagues (2007) conducted several experiments that studied the effect of labeling—emotional (i.e., giving a verbal label to an emotional stimulus, such as a face expressing an emotion) and non-emotional—on emotional regulation. The authors showed that affect labeling produced a significant disruption of amygdala activity, which led to their conclusion that affect labeling diminishes emotional reactivity and thus regulates emotion. A subsequent study (Lieberman et al., 2011) demonstrated that affect labeling also produced diminished self-report of the intensity of emotions (people in the affect labeling condition reported a lessened intensity of the stimuli), and that its effect is similar to reappraisal (Ochsner & Gross, 2005) or intentional distraction techniques. The authors concluded that affect labeling is an incidental and unintentional emotional regulation technique: although people are unaware of it (or even think it intensifies emotions) putting feelings into words leads to diminished emotional reactivity.

In the pilot study of the current research, participants watched a series of emotionally stimulating images under two conditions—emotional labeling or

control (non-emotional labeling). They were asked to rate the intensity of the feelings they experienced while watching the images. Labeling was chosen as a general paradigm for the purposes of this research, since it is an established paradigm of emotional regulation, which could also be easily expanded to include the shared reality condition (studies 1 and 2). The basic paradigm that was used in the pilot was later applied to the shared reality studies (studies 1 and 2) and hence will be described in detail in the procedure section.

Based on the Relevance of Representation (ROAR; Eitam & Higgins, 2010) theory that postulates that any relevant aspect of a stimulus would be equally accessible for psychological processing, and the psychological distancing theory (Amit, Algom, & Trope, 2009), it was predicted that a mundane, but *relevant*, labeling of the picture would produce the same psychological distance and thus would produce similar regulatory results to affective labeling.

Participants

Participants were 59 undergraduates (15 males; mean age of total sample = 20.27, $SD = 3.21$) at Columbia University who participated for class credit.

Stimuli

Following Kron, Schul, Cohen, and Hassin (2010), twenty moderately negative ($M = 2.5$, $SD = 0.5$, on a scale of 1-9²—from most negative to most positive) and moderately arousing ($M = 5.5$, $SD = 0.5$, on a scale of 1-9) images from the International Affective Picture System were chosen (IAPS; Lang, Bradley, &

² According to IAPS norms for all subjects (Lang, Bradley, & Cuthbert, 2005).

Cuthbert, 2005). The images were presented in a single order during the labeling task.

Design and Procedure

Participants were randomly assigned to one of two groups: affect labeling or category labeling. The first group (affect labeling) chose one label out of four—Sad, Angry, Disgusted, or Scared—that corresponded best to their emotional reaction to the picture (see Appendix A1) and said it out loud to an attached microphone. Participants were asked to “report the label that *best captures your emotional response* to the picture...and say it out loud to the microphone.” After every image that the participants saw and labeled, the participants were instructed to rate the intensity of their emotion *when* looking at the image, “Please rate the intensity of your feelings during the time you were looking at the picture,” using a 5-point nonverbal pictorial scale based on the Self-Assessment Manikin Scale, which asks participants to choose one picture out of five that corresponds best to their intensity of feeling, from least intense to most intense (Lang, 1980; see Appendix B). Intensity of feeling was measured after every image, thus every participant had twenty measurements of intensity.

The second group (category labeling) chose one label out of four—Person, Behavior, Tool, or Action—that corresponded best to their categorization of the picture (i.e., the category that best represents the image; see Appendix A2) and said it out loud. Participants were asked to “report the label that *best captures your categorization of* the picture...and say it out loud to the microphone.” After choosing

the label, the participants rated the intensity of their emotion on the same 5-point nonverbal pictorial scale.

Results and Discussion

Standard linear regression was used to analyze the data. Regarding the main task in this study: there was no significant difference between the intensity of feelings for the participants in the affect labeling group ($M = 3.2$, $SD = 1.2$) and the category labeling group ($M = 3.9$, $SD = 1.3$), $t(58) = -1.45$, $p = .15$. This finding suggests that in the current study participants in both labeling conditions experienced the same emotional intensity in reaction to the moderately negative stimuli they were presented with, and confirmed the hypothesis that affect labeling, if an emotional regulation strategy at all, is a part of a more general mechanism of labeling and verbalization that dampens negative emotional reaction through psychological distance (Amit et al., 2009).

In a recent study, Kircanski, Lieberman, and Craske (2012) found that affect labeling diminished behavioral and physiological but not self-reported measures of anxiety (as compared to other regulation strategies such as exposure) and concluded that affect labeling might affect behavioral and physiological measures of regulation, but not self-reported ones. The findings of this pilot study are consistent with this conclusion.

Additional Data Analysis

Apart from the main question regarding labeling and intensity, several other concepts related to emotional regulation were explored, including possible order effect, i.e., whether the same images, if presented in a later order, would produce

diminished emotional reactions as a result of habituation or learning (Bradley, Lang, & Cuthbert, 1993). A significant effect of order was indeed found: the same images that were presented at a later order elicited less intense responses, $t(58) = -2.58, p < .01$, suggesting that there was a process of “habituation” to the stimuli. In other words, when the same image was presented later participants (on average) rated the intensity of their emotional reaction to that image as significantly lower; the order of the image in itself was affecting the intensity of the emotional reaction to it.

Because the data indicated that response time (RT) decreases significantly for later images, $t(58) = -2.52, p = .015$, RT was controlled when analyzing the order effect. Even when controlling for RT, the order effect remains, $t(58) = -4.75, p < .001$. However, the interaction between order and condition was not significant, $t(58) = -1.20, p = .237$, meaning that the order in which the images were presented affected participants in the affect labeling and category labeling conditions similarly.

Conclusion

In summary, two main findings emerged from this study. First, there was no significant difference between the two conditions of labeling in their effect on the perceived emotional intensity of the images. In addition to the recent finding of Kircanski et al. (2012) that concluded that affect labeling may not be affecting self-reported measures of emotional regulation, these results—the lack of difference between the two conditions of labeling—would have been predicted by at least two other models. The “cognitive-load” model (Kron et al., 2010), would have predicted that any strategy that uses the same amount of cognitive resources would produce the same regulation result, and since there is reason to conclude that participants in

both conditions used the same amount of cognitive resources in their labeling, this model would have predicted the results found in this pilot study. The psychological distance model (Amit et al., 2009), would have also predicted these results, as it postulates that any strategy that produces the same psychological distance from the stimuli would produce same regulatory effect. In the case of the current research, it is definitely plausible that the act of verbalization in itself (which was *not* present in Lieberman’s labeling studies) had a similar distancing effect in both the category and affect labeling conditions. Both models provide plausible explanations to these findings.

Second, the significant order effect might be a manifestation of “habituation”—a gradual decline of reactivity over time (e.g., Bradley, Lang, & Cuthbertt, 1993). The concept, although widely used, was not intensively studied in self-reported emotional regulation paradigms to the best of my knowledge (but mostly in clinical settings and physiological research, e.g., Jaycoax, Foa, & Morral, 1998). This pilot study showed a basic emotional regulation mechanism in action: exposure to the same stimulus at a later order produced a less intense emotional reaction, a finding that seemed worthy of pursuing further in the added shared reality conditions.

The main paradigm of the pilot—two differential conditions of image labeling—was preserved in study 1, which examined the additional effect of shared reality when added to these labeling conditions.

Study 1: Labeling and Shared Reality

Method

Overview

Study 1 expanded the paradigm that was introduced in the pilot study to include shared reality. Shared reality was added as a within subjects variable both in the affect labeling condition (group 1) and in the category labeling condition (group 2).

This study created an experimental situation of shared reality and investigated its effects on emotional regulation. The main goal of this study was to examine whether shared reality functions as an intensifier or regulator of mildly negative emotions that are experimentally induced. In addition, study 1 was an exploratory study that was designed with study 2 in mind. It was an expansion upon the pilot study, which further established the labeling and shared reality paradigm. The pilot and study 1 were more exploratory in nature, while study 2 followed specific hypotheses that were tested.

Apart from the establishment of the experimental paradigm of shared reality for future use in the more extensive study 2, the main goal in study 1 was to explore the effect of shared reality on emotional regulation as would be indicated by the participants' rating of the intensity of their emotional reaction to emotionally stimulating images they watched. Since shared reality was not studied in connection to emotional regulation before, no specific prediction regarding its main effect was proposed.

On the one hand, and based on the clinical literature reviewed (e.g., Schore, 2009) and research on effects of emotional sharing like the “venting hypothesis” (i.e., that “venting” does not necessarily regulates negative emotions; Kennedy-Moore & Watson, 1999), it seemed plausible that sharing would intensify the emotional reaction to the image, especially if the target of the sharing is the labeling of the emotion itself. In this regard, it has been hypothesized (though not empirically verified) that sharing an emotion (for example, with a therapist) intensifies it. In addition, based on the epistemic motive of shared reality—having a valid representation of the world and establishing what is real (Higgins, 1992; 2012; Hardin & Higgins, 1996)—it could be predicted that in the shared reality condition (regardless of the labeling) the emotional rating would be more intense, since it is more real: the images were in fact negative.

On the other hand, based on the same clinical research (e.g., Schore, 2009) that stresses the importance of mutuality and attachment in affect regulation, it could be predicted that in the shared reality condition the intensity of the negative emotions would be lower, since sharing can function as an emotional regulation strategy. Since, to the best of my knowledge, the temporality question in successful sharing experiences has not been addressed empirically in clinical literature (i.e., when does sharing transforms from potential intensifier of emotions to their regulator?), the current study may be the first empirical evidence of the *immediate* (i.e., in the moment) effect of successful sharing on the intensity of negative emotional response as measured by participants’ self-report.

In summary, no specific hypothesis was formulated in study 1 regarding the potential intensification or regulation of feelings for participants in the shared reality condition. Rather, and based on the theories described, this study was seen as essentially exploratory in nature

Participants

Participants were 98 undergraduates (29 males, mean age of overall sample = 22.39, $SD = 5.01$) at Columbia University who participated for class credit.

Stimuli

The same twenty moderately negative ($M = 2.5$, $SD = 0.5$, on a scale of 1–9) and moderately arousing ($M = 5.5$, $SD = 0.5$, on a scale of 1–9) images from the IAPS (Lang et al., 2005) that were used in the pilot study were used in study 1, as well. The images were presented in a single order during the labeling task.

Design and Procedure

The study employed a 2 (shared reality vs. no shared reality; within subjects variable) X 2 (affect labeling vs category labeling; between subjects variable) factorial design.

Participants were randomized between the same two groups as in the pilot study: the affect labeling group (group 1) and the category labeling group (group 2). In the beginning of the study participants were told that there was another participant who would hear the label that they would share (participants chose a label from the same 4 labels, in each condition, as in the pilot study; the label that they chose was said out loud by using an attached microphone) and would have to choose between two images based on their labeling.

The participants were told the following: “Another participant who has two pictures to choose from, will hear you and will try to identify the picture you saw based on the category/feeling you reported. If the participant succeeds you will see a green colored screen; if the participant fails you will see a red screen.” In the shared reality condition, the participants were led to believe that another participant was able to choose the same image as they had, based on their reported label, thus implying that they *shared* their perception of the picture.

Participants were informed that the other participant (in reality, a computer) would choose between only two stimuli, to make the event seem more realistic and plausible, i.e., the ability of another person to choose an image based on one (albeit very relevant) word. A computer rather than an actual person was used as “another participant” in the study since an actual person could have created an element of possible in/out group “contamination” of the manipulation that would have been impossible to control for in this study; the shared reality effect disappears when the other participant is perceived as an “out-group” member (Echterhoff et al., 2005, 2009). Thus, a collaborator could not have been used instead of a computer (although it would have made the manipulation much more realistic), as it would have been impossible to control for potential out-group perceptions of the other participant, which could have eliminated the effect of shared reality.

In the not shared reality condition, the participants were led to believe that the other participant could not choose the image based on their labeling, thus implying that they did not share the same perception of the picture, whether in the emotional or categorical labeling condition.

The red and green screens that were indications of shared vs. not shared reality were randomized: every participant saw 10 of each in a random order (the reasons as well as limitations of this procedure will be discussed further). After seeing either a red or green screen (thus, only after learning whether they created shared reality with another participant or not), the participants rated the intensity of their feelings using the same SAM scale as in the pilot study.

The manipulation in this study achieved the four requisites of shared reality (Echterhoff et al., 2009). First, the event was subjectively perceived as sharing—the participants were led to believe that they and someone else share the same thematic or emotional categorization of a particular image—and they did not, for example, feel that they simply imitated someone else or behaved “as if” they shared the same perception. Second, the shared reality was *about* a target: the IAPS image. Third, since the sharing was “unintentional” and with no specific goal (e.g., promotion, liking) it can be assumed that the motivation was either epistemic or relational, as was demonstrated in previous studies that explored the motivational aspects of shared reality (Echterhoff et al., 2005; Echterhoff et al., 2008; Kopietz et al., 2010). Fourth, the experience of “success” was directly manipulated in this study: participants either believed that they shared reality (had the same response to an image) or not.

Despite fulfilling the four prerequisites for shared reality, this experiment expanded the established “communication game” paradigm to include emotional sharing, which was not done before; this may have created an “emotional sharing game” paradigm (certainly in the affect labeling condition) in which the target of the

sharing was one's *own* reaction to an emotional stimulus and not an evaluation of an external target, and in which the studied effect was the emotional aspect of sharing and not the previously studied epistemic and relational ones.

Results and Discussion

Manipulation Check

Since the study employed a deception (misleading participants to believe that there was another participant, while in reality the computer randomized the responses), a manipulation check was added to assess whether the participants believed the deception or not. There is no published work on appropriate procedures for manipulation checks for shared reality research. However, based on consultations with three shared reality researchers (Rene Kopietz and Gerald Echterhoff, in Germany and Shira Mor, in New York) a particular manipulation check was used. It was more explicit than the German version (used by Kopietz and Echterhoff) and more in line with the American version (used by Mor). A free-verbal format for the response was used and after the completion of the experiment participants were asked the following: "For half the participants there was another participant (who guessed the pictures); for the other half there was not. Which condition do you think you were in?" And then, "If you answered that you think you were in a condition without the other participant, when did you think first think that? During the experiment, or now when questioned?"

A total of 57 participants (58.1%) responded that they were in a condition with another participant, 17 more (17.34%) responded that they thought they did not have another participant only when questioned. This left 24 participants

(24.48%) that thought that 1) there was not another participant and 2) that they thought about it during the experiment itself (and not after, when asked). However, this percentage could perhaps be explained by the explicit nature of the manipulation check—it is possible that the question itself prompted their doubts. In fact, many of the “non-believers” reported that they expected to be “deceived” in psychological experiments and the question might have prompted them to reaffirm their beliefs. In addition, although the number of the non-believers is higher than in shared reality research in Germany, it is lower than in experiments led by colleagues in New York (Echterhoff and Kopietz, personal communication, October 2012; Mor, personal communication, October 2012). More importantly, eliminating this group did not affect the results of the first study (to be discussed), perhaps because the “non-believers” were in fact doubters.

Standard ANOVA and linear regression techniques were used to analyze the data. As in the pilot, no significant difference in the perceived intensity of emotions between the affect labeling and the category labeling group was found, $t(97) = 1.50$, $p = .14$. This non-effect remained even after controlling for shared reality ($p = .42$), providing additional evidence that affect labeling (if a regulation strategy at all) might be part of a more general labeling mechanism as was discussed earlier.

The order effect was replicated. As in the pilot study, the data indicated that the same images, if presented at a later order, resulted in lower ratings of intensity of emotions, $t(97) = -3.51$, $p < .01$. Also, as in the pilot study, the interaction between order and labeling condition was not significant, $t(97) = -0.76$, $p = .45$.

Regarding shared reality: there was a main effect of shared reality on perceived intensity of emotions. Participants in the shared reality condition reported significantly higher intensity of emotions ($M = 3.25$) than participants in the not shared reality condition ($M = 3.09$); $t(97) = 2.71, p < .01$. This finding would be in the direction of the prediction based on the epistemic motive of shared reality: perceived intensity of emotions “should” be higher in the shared reality condition, as it was more “real;” the images were negative (Higgins, 1992; Hardin & Higgins, 1996).

The interaction between shared reality and labeling was not significant, $t(97) = 1.06, p = .30$. As discussed in the literature review, it seems reasonable to assume that a specific focus on emotions when sharing them would produce an intensification of affect—in the case of the current study, to expect a specific interaction between affect labeling and shared reality. However, this was not the case with these findings—there was no significant difference between the conditions, and the only significant effect that was found was the main effect of shared reality (no interaction with labeling).

The non-interaction between shared reality and labeling would not be predicted by clinical theory; however, it would be in line with the ROAR (Eitam & Higgins, 2010) theory prediction, since the negative affect is activated and accessible in both conditions, and since successfully sharing *any* relevant aspect of the image should intensify the activated affect (in the case of current study, either the category or the emotion). This non-interaction informed further exploration and

(in part) the design of the second study, attempting to solidify the relevance aspect of the mechanism of shared reality, as will be discussed.

An additional significant finding was the interaction between shared reality and order effect, $t(97) = 2.81, p < .01$. Participants in the shared reality condition showed significantly less decrease in the intensity of negative emotion with repeated exposure than participants in the not shared reality condition. This finding suggests that shared reality not only intensifies emotional reaction to negative stimuli, but also maintains negative affect, since the order effect ceases to be significant for participants who shared reality. This finding seems to emphasize even more the strength of the shared reality effect, as it is not reversed or nullified by a regulatory process that was identified earlier in the current research: the order effect.

The finding that shared reality intensifies and maintains the short-term emotional reaction to negative stimuli stands in contrast to clinical intuition and research that argues for the psychological benefits and emotional regulatory consequences of successful sharing (e.g., Pennebaker et al., 2001; Schore, 2009). In the experimental situation that was created, successfully sharing a (relevant) perception of a moderately negative stimulus with an *anonymous* person, the sharing intensified the emotional reaction; it did not regulate it. A question that was not explored in the current research, but seems important for future research is whether the effect would be different if the sharing would occur with a person that the participants actually saw or knew. Shared reality has never been studied among people who know each other; however, this finding suggests that such exploration

might be necessary for better understanding of the emotional effects of shared reality and its operating mechanism.

There are many questions regarding the clinical implications of this finding. For example, could sharing a negative emotion with the therapist have an intensifying effect in the beginning of treatment but then gradually (as the patient gets to know the therapist) reverse and become regulatory? Should clinicians be aware of this effect when encouraging their patients to share a relevant, negative emotional reaction? Perhaps by doing so, by acknowledging the possible trend of “things become worst before they become better”—that emotions become more intense when initially shared but then, with the effect of habituation (order in this study)—clinicians might succeed in regulating the intensity of their patients’ emotions. These questions are outside of the scope of current research; however, the shared reality design that was introduced in this research could be replicated in other settings to explore them.

Perhaps similarly to the use of virtual reality in trauma treatment (e.g., Olasov-Rothbaum, Ruef, Litz, Han, & Hodges, 2004), the shared reality design could be used in creating a situation of sharing (with the therapist being the audience) of negative stimuli that are relevant to patients’ lives in a controlled, monitored setting. Different conditions of sharing and different clinical populations could be investigated in an attempt to understand better the effects of shared reality on emotional experience and regulation.

Summary of the pilot and study 1 and implementations for study 2

Study 1 and the pilot examined the effects of labeling and shared reality on emotional regulation, while focusing on the most basic aspect of regulation: perceived intensity of emotions. These studies used a paradigm to study emotional regulation that included two concepts (labeling and shared reality) which could be used in future studies to expand further our understanding of shared reality, emotional regulation, and emotional experience.

The pilot study examined whether affect labeling affects emotional reactivity differently than another type of labeling, category labeling. Moreover, the pilot study provided the basis of the paradigm for the two subsequent studies in this research that also included shared reality. Both goals of the pilot were achieved: the basic design of visual presentation of stimuli, labeling of the stimuli, and sharing them provided the basis for both subsequent studies and can be easily used and adapted to future studies of shared reality and emotional experience and regulation.

Study 1 examined how shared reality, when introduced as an addition to the labeling conditions, affects emotional regulation to negative stimuli. Although the manipulation of shared reality that was introduced in study 1 was not used in the past (computer feedback from a perceived “audience;” using red vs. green screens), the manipulation achieved the four requisites of a shared reality manipulation that were discussed earlier (Echterhoff et al., 2009). The pilot and study 1 produced several significant findings and had several limitations. In what follows, I discuss both and also discuss the limitations that were addressed when designing study 2.

Several general findings emerged. First, the pilot and study 1 established that affect labeling does not attenuate negative emotional responses more (or less) than another form of labeling, category labeling. As mentioned, this could be an indication that labeling might be a general mechanism of emotional regulation (via either cognitive load or psychological distraction), and affect labeling is only a manifestation of that general mechanism (a proposition that Lieberman et al., 2011, advanced as well).

Second, and most importantly, study 1 showed that shared reality intensifies and maintains immediate emotional reactions to negative stimuli. The difference between the shared reality and the not shared reality condition was rather small ($d < .3$); however, it is the first experimental indication that shared reality intensifies emotional reaction to negative stimuli. Future studies can further clarify the conditions and mechanisms of operation of shared reality in regard to emotional processes; in fact, study 2 of the current research serves as such an attempt.

Third, the pilot and study 1 showed an order effect. Same images produced less intense emotional responses if they were presented later. Despite this finding being somewhat “intuitive”—one can think of the concept of habituation or “learning” that would predict such results—there seems to be little if any research that shows self-reported attenuation of emotional responses over time. The main focus of the research thus far has been the physiological effects of habituation (showing that bodily responses to negative stimuli attenuate over time; Bradley et al., 1993), or the clinical use of habituation, for example as a treatment to trauma in which continual exposure to traumatic stimuli leads to attenuation of the emotional

responses to the stimuli (Jaycox et al., 1998). The order effect seems to be rather robust and was replicated in study 1; that is, not disappearing with the introduction of shared reality. Future studies may further expand on this effect, and focus on the mechanism itself in trying to better understand whether it is indeed habituation or emotional learning, for example. The order effect was addressed in the second study as well.

Implementations and Modifications for Study 2

First, and in regard to the manipulation of shared reality, the choice to randomize shared reality and not shared reality condition with 10 presentations of each image in the first study was problematic. Although data analysis did not indicate that the first two or three shared reality/not shared reality manipulations produced significantly different results than the 10 together, prior research suggests that people would most likely assume that there is a shared reality in a manipulation like that in this study, and thus after a few unsuccessful attempts in sharing might experience a sense of failure in establishing shared reality (see Kopietz et al., 2010 for discussion of this topic).

This limitation was addressed in the second study by manipulating shared reality between and not within groups, with the successful shared reality reflecting a 80/20 ratio, and with the first three images being successfully shared in the shared reality condition. In addition, and following the responses of the participants to the manipulation check, a “booster” to the manipulation was added: a live chat (with a Google chat technology, “gchat”) that was performed with a research assistant. This was designed to increase the belief that there was in fact another

participant (and not a computer) with whom the participants shared or did not share reality. This booster has never been used before and represents another additional feature of this study to the established shared reality design and operationalization.

Second, and since the effect of shared reality was examined on negative stimuli only (and in fact, on quite distinct negative stimuli), study 2 examined the effects of shared reality on emotionally ambivalent stimuli. As much (perhaps most) of emotional life is experienced ambivalently and ambiguously, study 2 focused on the effects of shared reality on such stimuli and examined the potential differences and similarities between them and the negative stimuli that were studied in the first study. To the best of my knowledge, this (the effects of sharing ambivalent stimuli on emotional regulation) has not been done previously in emotional regulation research. However, prior shared reality research mostly focused on ambiguous targets of sharing (recall the ambivalent target in the initial saying-is-believing study; Higgins & Rholes, 1978) and suggested that people who achieve shared reality gain more certainty about the ambivalent objects of sharing and remember what they shared rather than what they initially learned about the object (Echterhoff et al., 2005; Kopeitz et al., 2010).

Third, following the finding that the interaction between labeling and shared reality was not significant even when there was a significant effect of shared reality, study 2 further examined how shared reality can affect emotional reactivity, regardless of the content that is shared. In other words, study 2 was designed to test

whether the effect of shared reality would be significant regardless of the content that is shared, as long as this content is relevant to the stimulus.

Fourth, study 2 manipulated the “*aboutness*” (recall that it is one of the requisites for shared reality) more effectively. As will be described in the procedure section (below), participants were given more freedom in choosing their labels, making it more representative of sharing in the real world and also closer to the initial saying-is-believing paradigm.

Fifth, more dependent measures that examined additional emotional effects of shared reality were added in study 2. For example, this study was designed to examine whether (as would be predicted by clinical literature, e.g., Linehan, 1993; Stern, 2004), despite a higher rating of emotional intensity in the shared reality condition, the subjective well-being of participants who successfully shared their reality would also be rated as higher. In other words, whether the mechanism of sharing simultaneously intensifies the perceived emotion *and* the subjective well-being (even if the intensified shared emotion is negative, as in study 1).

Lastly, study 1 proposed that there is a main effect of shared reality, but did not offer the mechanism that might drive this effect. Study 2 was designed to test such possible mechanisms based on previous literature and in line with the paradigm that was developed in this research. Several measures that tested the concepts of “realness,” relevance, and certainty, were introduced. All these measures are proposed to constitute the operational mechanism of shared reality (independent of the emotional processes).

CHAPTER IV: STUDY 2: SHARED REALITY AND EMOTIONAL EXPERIENCE

Method

Overview

Stemming from the results of the first study and the pilot, and the literature that was reviewed, study 2 was designed to further examine the effects of shared reality on emotional experience and regulation. The second study was based on the paradigm that was developed in the first study and the pilot: presentation of images, their labeling, and a manipulation of shared reality. The second study was divided into two sections: an initial pilot section, which was designed to choose the 10 most appropriate (i.e., ambiguous) images for the study, and an experimental section, which used these images in the manipulation of shared reality.

Since the second study was designed to examine the effects of shared reality on ambiguous stimuli, the main goal of the pilot section was to choose the most ambiguous stimuli from the IAPS images—images that produced both negative and positive responses from participants. Based on the average rating of valence that is available in the IAPS (Lang et al., 2005), 20 neutral images were chosen for the pilot; participants rated their valence and the 10 most ambiguous were chosen for the experimental section.

The experiment section of study 2 used the 10 most ambiguous images from the pilot. There were four groups in the study: shared reality (in category vs. affective labeling conditions), and not shared reality (in category vs. affective labeling conditions). Shared reality was manipulated similarly to study 1:

participants were led to believe that another participant was either successful or not in identifying the image the participants' saw based on their labeling of the image.

Pilot Phase

In the pilot phase 30 participants (10 males; overall mean age = 25.43, $SD = 4.85$) watched 20 neutral images from the IAPS in terms of valence ($M = 5$, $SD = 0.5$, on a scale of 1-9) and arousal ($M = 4.5$, $SD = 0.5$, on a scale of 1-9). Based on the input of colleagues in the field, the 20 images that were chosen were evaluated not only as neutral but also as potentially ambiguous, i.e., for some people positive and for others negative (such as the image of bees for example, or an expressionless man; see Appendix E). This initial pool of 20 images was reduced to the 10 most ambiguous ones, based on participants' ratings.

The images were presented in a single order during the task. Each image was displayed for 8 seconds. The participants were then asked to determine whether the image was more "positive" or "negative," on a scale from -5 ("extremely negative") to +5 ("extremely positive"). Since the images were neutral, participants did not have a 0 option (as it would have been the natural choice for most participants given the images' average valence value); thus, participants had to choose whether the image seemed more positive or negative to them.

In addition, the decision not to include the 0 option was made with the shared reality condition in the experimental phase of the study in mind: including the 0 option would have made the future manipulation of shared reality improbable, as the ability of "another participant" to choose an image based on a 0 response would not seem realistic or possible. The image had to be rated as either more

positive or more negative, even if slightly so, to make the manipulation of choice seem probable and realistic.

Results of the Pilot Phase

The main goal of the pilot phase was achieved. The 10 images that produced the most polarizing results were chosen. Although no image produced a perfect split of 50/50 in terms of negative/positive responses between participants, each of the 10 images chosen had a polarizing effect, with the best ratio being 46/54 (negative/positive) and the worst 32/68 (negative/positive).

Experiment Phase

Method

Overview

The 10 most ambiguous images based on the ratings from the pilot phase were chosen for the experiment. The study expanded the exploration of the effects of shared reality on emotional experience and well-being to include additional dependent variables, and added several measurements of well-being and attachment to the existing intensity rating measure, while maintaining the basic structure of the design from the previous studies: presentation of images, their rating, their labeling (affective vs. categorical), and creation of shared reality based on the labeling.

The additional emotional measurements were chosen since 1) they measure central aspects of emotional experience (e.g., attachment), the focus of this research, and 2) they were specifically hypothesized to be affected by shared reality, as will be discussed.

The stimuli in this study was changed from negative to ambiguous to provide additional data on the effects of shared reality in a context of a different valence of emotional experience. In addition, since shared reality is proposed to be a mechanism of establishing what is real and certain in the otherwise ambiguous reality (Hardin & Higgins, 1996; Kopeitz et al., 2010), the study sought to examine that element in the emotional context, as that has never been done before. Measures of “realness,” relevance, and epistemic certainty were added in the second study, to understand better that mechanism.

Participants

Based on the average difference of self-reported intensity of emotions between the shared reality and no shared reality conditions in study 1, it was calculated that in order to achieve an effect size of $d = 0.8$ ~60 participants per cell were needed, resulting in a total of ~240 participants. The actual number of participants in study 2 was 239 (76 males; overall mean age = 23.20, $SD = 4.12$).

Design and Procedure

The study employed a 2 (shared reality vs. no shared reality; between subjects) X 2 (affect labeling vs. category labeling; between subjects) factorial design.

Based on the results of the manipulation check in the first study, an additional “booster” was added to make the presence of “another participant” more believable for participants. Throughout the study there were two research assistants present at all times. One of the assistants welcomed the participants, instructed them on the procedures of the study, and handed them the post-

experiment questionnaires. The other assistant sat in a rear room (and was not visible to the participants). Before the experiment began, the participants were asked to open the Google-chat program on the computer and were told that when the other participant would be ready, they would receive a message from them and would be asked to reply when they were ready. In reality, it was the other assistant who sent a message on the chat stating that he/she is ready (the gender was not stated in the message purposefully, and the participants could not know the gender of the participant). Messages were very short (few words) and were slightly changed from participant to participant to make the interaction seem more genuine. The messages were casual, friendly communications, such as “Hi, I am ready, tell me when you are so we can begin.” This “boost” has never been used in shared reality research, in part because it was assumed that such an interaction might make participants feel closer to the imagined participant (Kopietz, personal communication, October 2012)—an artifact that would have been beneficial for the purposes of this study, as it had the potential to make the computerized interaction seem more realistic and human.

After exchanging messages with “another participant” via chat, participants viewed a series of 10 IAPS images that were presented in a single, randomized order during the task. Each image was displayed for 8 seconds. In the affect labeling condition the participants were asked to indicate whether the image was more “positive” or “negative,” on a scale from -5 (“extremely negative”) to +5 (“extremely positive”). In the category labeling condition, the participants were asked to choose whether the image was more “active” or “passive,” on a scale from -5 (“extremely

passive”) to +5 (“extremely active”). “Passive” vs. “active” categories were chosen as they fulfilled the following criteria: 1) they were *relevant* (Eitam & Higgins, 2010) and applicable to the stimuli presented and to sharing, and 2) they were orthogonal *and* continuous (Tversky & Hemenway, 1984; so it could parallel the valence in the affective labeling condition and could be rated in a continuous scale). It was almost impossible to select a category that would satisfy the two above-mentioned criteria that would have been completely free from emotional connotation. However, and although in general “active” has an emotionally more positive connotation than “passive” (Bradley & Lang, 1990), in the context of the stimuli that were used (see Appendix E), it is believed that it was not an emotionally loaded distinction, such as would have been the case for pleasant/unpleasant, familiar/unfamiliar, good/bad, dangerous/safe, etc.

After viewing all 10 images, participants were presented with the same images again in a random order and were asked to rate the intensity of their feelings regarding each image on the SAM scale—the same scale that was used in the first study and the pilot. In addition, the participants were asked, for every image, to rate how real and engaging were the depicted events in the picture. Participants’ perceptions of “realness” and engagement were measured as possible indicators of the operating mechanism for shared reality (as will be explained in the hypotheses section). As “realness” and engagement have been studied in the context of shared reality in the past, the questions from Higgins, Franks, Sehnert, Manely, & Pavarini (2013) were used: “I could easily imagine the events depicted in the picture taking place”; “I could picture myself in the scene of the events depicted in the picture; “I

was mentally involved in assessing the picture while viewing it”; “The events depicted in the picture are relevant to my everyday life”. Each item was answered on a scale of -3 (“not at all”) to +3 (“very much”). Finally, to measure the epistemic certainty of the participants regarding their perceptions of the images—an additional proposed feature of the operational mechanism of shared reality—participants were asked to depict the events in every image (as a free verbal response) and then to rate how certain they were about their depiction on a scale of -3 (“not at all”) to +3 (“very much”).

Shared reality was manipulated by reporting to “another participant” after every image whether it was more positive or negative (affect labeling condition), or more active or passive (category labeling condition). Shared reality was manipulated similarly to the first study: providing participants with feedback regarding successful vs. unsuccessful identification of the image by “another participant” using a red vs. green screen. The exact wording of the instructions was the following: “Another participant who has two pictures to choose from will try to identify the picture you saw based on your rating. If the other participant succeeds you will see a green screen; if the participant fails you will see a red screen.” In reality, and similarly to the first study, there was no other participant, and the responses were generated by a computer. Following Echterhoff (personal communication, October 2012) and in order to increase the power of the manipulation, the ratio that was chosen for the shared reality condition was 80/20 successful identification (i.e., 8 green screens that symbolized correct identification of the image vs. 2 green screen that symbolized incorrect identification; as opposed

to the 50/50 ratio in study 1); and 20/80 successful identification in the not shared reality condition. The ratio was programmed in such a way that the first and the last feedback in the shared reality condition were always positive. This decision stemmed (as mentioned earlier) from the understanding that people expect to share reality; hence the study was designed to not create an experience of failure at the outset, which could potentially undermine the shared reality condition (Kopietz et al., 2010).

After the completion of the task, the participants were asked to complete two questionnaires, measuring their well-being and the quality of their attachment, and answer a question about their global life satisfaction. All of which, as was mentioned earlier and will be further discussed in the hypotheses sections, were expected to be affected by shared reality.

Additional Measures

After the completion of the experiment, the participants were asked to complete the following two questionnaires, measuring well-being and attachment: *Well-being scale*. The brief Positive and Negative Affect Schedule, PANAS, questionnaire (Watson & Clark, 1994; see Appendix C) was chosen to measure well-being. It is a widely used and well-validated questionnaire (the alpha reliabilities for both scales are high, generally ranging from .83 to .90 for Positive Affect, and from .85 to .90 for Negative Affect) that measures both positive and negative affects, asking participants to rate to what extent they feel as the word (e.g., happy, sad) indicates. There are 10 words that describe positive affective states (e.g., proud, enthusiastic) and 10 words that describe negative ones (e.g., guilty, afraid), thus

allowing measurement of both positive and negative affects as indicators of well-being. Apart from being well researched, frequently used in the past, and relatively brief, this questionnaire was chosen because it is validated for use as a state measure, i.e., measuring well-being in the present moment (see Watson & Clark, 1994 for a discussion of the convergent and discriminant validities of the measure with other state affective measures); by contrast, most well-being questionnaires assess well-being over a period of a week or two and not in the moment. An additional advantage of the PANAS is that it has extensive data on normative levels of well-being in healthy populations, to which the results can be compared.

In addition to the PANAS scale, participants were also asked a general, global well-being question: “How satisfied are you with your life right now?” The response scale ranged from -3 (“not at all”) to +3 (“very much”).

Attachment scale. Most attachment scales are targeted at specific attachments (usually with parents or relationship partners; Ravitz, Maunder, Hunter, Sthankiya, & Lancee, 2010); however, for the purposes of this study a general scale—that is, not specific to certain people in the participants’ lives—was needed to measure the attachment quality as a general state that would be potentially affected by shared reality. Based on the review of the content and psychometric qualities of current attachment scales by Ravitz et al. (2010), the Measure of Attachment Qualities, MAQ was chosen (Carver, 1997; see Appendix D). The MAQ has 14 items. Each item is a statement to which participants indicate the degree of their agreement, ranging from 1 = “not at all” to 4 = “extremely.” The MAQ loads on three scales, which are categories of attachment: secure, avoidant, and anxious-ambivalent. The measure

has not been researched as much as some of the more established specific attachment measures, but produced adequate internal consistency (with alpha reliabilities at .83 for the first two scales and .66 for the third scale; see Kim & Carver, 2007; Kim, Carver, Deci, & Kasser, 2008).

Hypotheses

There were several hypotheses and research questions proposed in the second experiment:

Hypothesis 1: Shared reality will produce more intense emotional ratings of the images.

The participants were asked to choose a rating for the images in both the affect and the category labeling condition. According to this hypothesis, their ratings of intensity will converge around their initial chosen ratings, instead of being simply neutral. Thus, if a participant would rate the image as more positive and would share reality with this rating, it was predicted that he would rate the image as more emotionally intense than a participant who did not share reality and thus will rate the image as more neutral. This prediction was based on the assumption that what is real and relevant (Eitam & Higgins, 2010) in this scenario would be the shared reality of the picture—that is the chosen rating, promoting higher levels of intensity, since the choice had been made and the reality of the image was not neutral anymore. As mentioned, participants were forced to choose a valence (rating the images as either positive or negative), as it was evaluated to be the only viable way to establish shared reality using current design (choosing an image with a 0 rating, as a manipulation of shared reality, seemed improbable). In doing so, it was

predicted that shared reality would make participants' choice seem more real and thus intensify their emotional reaction to the stimulus; in a sense, making "the positive seem more positive, and the negative more negative."

Research question 1: The ratings of intensity in shared reality will not be affected by the labeling condition.

Since in both the affect and category labeling conditions the sharing is about something relevant to the image, it was predicted that similarly to the results of the first study there would be no interaction between shared reality and labeling in the rating of the intensity of the image. The results in study 1 (as well as the research that supports them and was discussed above) suggested that there would not be a significant interaction between the labeling condition and shared reality.

Hypothesis 2: Shared reality will make the events in the image seem more real and engaging.

Since shared reality establishes what is real, and based on the results of previous studies that examined the effects of shared reality for ambiguous stimuli (e.g., Echterhoff et al., 2005; Kopeitz et al., 2010) it was predicted that in the shared reality condition participants would rate the events depicted in the images as more real and engaging, as measured by the "realness" questions (Higgins et al., 2013). Further, it was predicted that this effect would be produced in both labeling conditions similarly, since it was proposed that whenever a relevant aspect of the stimulus (image) is shared, the entire stimulus (image) should seem more real. Although shared reality theory proposes that shared reality makes the events seem more real and relevant, this has not been shown empirically before. An additional

reason to test this hypothesis lies in the assumption that this situation is the further possible elucidation of the operational mechanism of shared reality that would also be relevant to emotional research: shared reality was proposed to operate through making stimuli (including emotional stimuli) seem more real and relevant.

Hypothesis 3: Shared reality will promote epistemic certainty.

It was predicted that participants in the shared reality condition would be more certain regarding their depiction of the events in the images as a result of sharing reality about their evaluation of the images. Although this would follow previous results in shared reality research (see Kopietz, et al., 2010), this effect (similarly to the previous hypothesis) has been proposed theoretically but never reported empirically. It was proposed that certainty is an additional element of the operational mechanism of shared reality: shared reality makes people more certain about the stimuli they perceive (i.e., their perceived reality).

Hypothesis 4: Shared reality will promote subjective well-being.

It was predicted that participants in the shared reality condition, regardless of the labeling condition, would report higher levels of well-being, as measured by the PANAS questionnaire. As discussed earlier, there is a vast clinical literature that argues for the importance of successful sharing of one's inner state for one's subjective sense of well-being (see Linehan, 1993; Stern, 2004). It was hypothesized that successfully establishing shared reality would promote well-being regardless of the condition (affective vs. categorical labeling), so that a main effect of shared reality would be found. Stemming from the results of study 1, it was proposed that

even if the intensity of (negative) emotional reaction increases for people who share reality (as was shown in study 1), their subjective well-being could increase as well.

The combination of the results of study 1 and the hypothesized results of study 2 aimed to demonstrate that shared reality creates a somewhat paradoxical state, in which feeling something intensely, even if negative, but being able to successfully share it, might increase the subjective well-being associated with the intense feeling. Perhaps pointing to a parallel emotional mechanism of shared reality: intensifier of emotions and of subjective sense of well-being, even if the emotions that were shared were negative. This hypothesis was not tested in study 1, so even if it would be supported in study 2, its application to negative stimuli would only be a conjecture, as the stimuli in study 2 were ambiguous.

Hypothesis 5: Shared reality will promote secure attachment.

Similarly to the previous hypothesis, it was proposed that regardless of the content of sharing, successful establishment of shared reality would promote participants' sense of secure attachment. Since attachment phenomena have been described as "state-dependent traits" (Ravitz et al., 2010) it was predicted that creating shared reality (a specific, emotionally positive state) regardless of the labeling condition, would produce higher rating of secure attachment: people in the shared reality condition would have a higher score on the security category of the attachment scale than people who did not share reality, regardless of the labeling condition. This prediction was perhaps more ambitious than the previous ones, as it was not certain that the manipulation of shared reality was powerful enough in this study to affect such a stable measure as secure attachment. Even though attachment

can be affected by specific states that are induced experimentally and even though the measure chosen was shown to be sensitive to somewhat similar manipulations in the past, it was not clear whether the brief state of shared reality that was induced would produce a powerful enough effect to be registered by this measure.

Research question 2: The order effect will disappear.

It was predicted that the order effect that was consistent in the first study and the pilot would disappear. As discussed earlier, the order effect that was found is understood in the context of this research to indicate a process of habituation of the participants to negative stimuli that they were exposed to. Since the stimuli in the second study were neutral, it was predicted that the intensity of the response to them should not change with time—there was not a habituation process that was expected to happen.

Results of the Second Study

Manipulation Check

The Google-chat “boost” that was introduced in the second study did not eliminate completely the “non-believers”; however, it increased the believers. The percentages were as follows: 156 participants (65.3%) indicated that they believed that there was another participant; 46 participants (19.2%) indicated that they did not think that there was another participant, but that they thought about it only when asked; 37 participants (15.5%) reported that they did not believe that there was another participant and that they thought about it during the experiment.

As was suggested in study 1, it is possible that the direct question used in current research might have produced a relatively high number of non-believers.

Further, if a participant does not believe that there is another participant after chatting in real time with them before the experiment, it seems that there is little (if anything) that can be done to enhance the number of believers using the current research paradigm. The only alternative is to actually *see* the other person, which, as will be discussed, has not been done in shared reality research because of the potential perception of the other participant as a member of the “out” group, which eliminates the effect of shared reality (Echterhoff et al., 2005, 2009).

Hypothesis 1:

The hypothesis was not supported.

There was no significant difference between the intensity of participants' ratings in the shared reality vs. not shared reality condition, $t(238) = -0.56, p = .58$. As the participants chose between either a positive or negative valence for each image in the affective labeling condition, a further analysis was conducted, in which responses were divided to two groups: affect-positive and affect-negative. However, this division had no effect: shared reality did not intensify the ratings of feelings. It is believed that this lack of difference might be due to the fact that the images were in fact neutral, and the (forced) choice of valence by participants did not change their perception of them as essentially neutral.

Since the stimuli in the second experiment were neutral, and did not produce strong emotional reactions, it allows a comparison with the first experiment, in which shared reality intensified the emotional reaction to negative stimuli. Perhaps the relative neutrality of the stimuli in the second experiment dictated the disappearance of the effect: what was real and relevant was the neutrality of the

stimuli, which was intensified in the direction of the prediction of the participants in the shared reality condition, contrary to prediction. However, an important conclusion can be drawn from the two experiments combined: that shared reality intensifies emotional reaction to negative stimuli, but not to neutral (even if ambiguous) ones. Future studies can examine whether the same intensification happens for positive stimuli as well (it would be predicted, based on the results of this and previous research).

Research question 1:

The prediction of this research question was supported.

Based on the first two experiments, the prediction was made that even if a significant difference in the intensity rating between the shared reality and the not shared reality conditions was found (and it was not; hypothesis 1), a difference between the affect labeling and category labeling conditions would still not be found. The hypothesis was supported and there was no difference between the two labeling conditions, $t(238) = 0.18, p = .86$. This finding gives further evidence that in terms of emotional regulation, there might not be a difference at all between the two labeling conditions. Further, since the manipulation of the labeling condition was different in the second study from the first study and the pilot, and was tested on both the negative (pilot and study 1) and ambiguous stimuli (study 2), the combined findings question Liberman et al.'s (2007, 2011) conclusion that affect labeling is a distinct mechanism of emotional regulation. It is believed that further studies on affect labeling might benefit from these findings in the attempt to

precisely depict and understand the qualities that make labeling in general, and affect labeling in particular, an emotional regulation mechanism.

Hypothesis 2:

This hypothesis was partially supported.

When combining all four “realness” and engagement questions that were depicted above, the result is significant and in the direction that was predicted ($t(238) = 1.98, p < .05$). Further, the effect is maintained for the three “realness” questions (without the engagement one; $t(238) = 2.42, p = 0.016$). These results suggest that, as predicted, shared reality made the events in the image seem more real and engaging. However, a closer look at the results shows that there was only one question of the four that drove this effect: “the events depicted in the picture are relevant to my everyday life.” This question differentiates between the shared reality and the not shared reality condition; the events did seem more relevant for participants in the shared reality condition ($t(238) = 2.25, p < .05$). None of the other three questions was found to be significant by itself. Since questions 1 and 2 targeted the “realness” of the events (question 1: ability to imagine the events; question 2: ability to picture oneself in the events) and engagement (question 4), while the question that was found to be significant (question 3) targeted the *relevance* of the events, it can be concluded that the current study showed that there is evidence that shared reality makes events (perceived reality) seem more relevant, but does not make them seem more real or engaging. This finding adds a distinction to the “realness” and relevance aspects of the operational mechanism of shared reality, as there was not a separation between the two in the research thus far

(Eitam & Higgins, 2010; Higgins et al., 2013). It had been postulated that the shared reality effect operates by making the events seem both more real and more relevant.

The results of the current study show that this might not be the case, at least for emotionally ambiguous stimuli that were examined. As mentioned, this hypothesis was not examined in study 1, but it would be predicted that the result should be similar to study 2 and that the reason for the intensification of feeling that was found in study 1 in the shared reality condition was driven by the same mechanism: shared reality made the content more relevant and thus intensified the (already negative) emotional reaction to it. In study 2, since the stimuli were neutral, their increased relevance did not lead to intensified emotional reaction. Future studies should address this difference in an effort to understand the distinction between relevance and “realness” as operative mechanisms of shared reality.

Hypothesis 3:

This hypothesis was not supported. It was predicted that shared reality would promote epistemic certainty—participants will be more certain in their depiction of the events/stimuli. Participants were asked to first depict the events they saw in the image (in a free text format) and then to rate how certain they were in their depiction. Participants in the shared reality condition were only marginally significantly more certain in their depiction ($t(238) = 1.87, p = .062$) than participants in the not shared reality condition. This marginal trend is in the direction with previous shared reality research that suggests that shared reality promotes epistemic certainty, i.e., people are more certain about their perception of

reality if they share it. In fact, shared reality becomes *the* reality as was discussed above (see Kopietz et al., 2010 for a discussion of this issue). However, this was not supported in the current research. Since there is a trend in that direction, it is argued that a more powerful manipulation of shared reality (e.g., a more realistic situation of sharing) would have made this effect significant. The theoretical underpinnings of this proposed effect is rather consistent, and it seems that the failure to show this effect in the current study is a manifestation of the relative lack of power that was a result of the current computerized and controlled experimental manipulation of shared reality.

Hypothesis 4:

The hypothesis was very partially supported.

While the positive and negative affect aggregates were not significantly different between the shared reality condition and the not shared reality condition, participants in the shared reality condition reported that they were less afraid ($t(238) = -2.45, p < .05$), and less guilty ($t(238) = -1.96, p = .051$). This finding is consistent with previous research that showed that guilt is more intensely elicited when emotional events are not shared with others (Finkenauer & Rime, 1998; Rime, 2009), while fear was shown to be an emotion that is elicited more when people are alone (Scherer, Wallbott, Matsumoto, & Kudoh, 1988; Fischer et al., 2003). This would be in line with the relational aspect of shared reality: people share reality to feel more connected to others; which, in this case, might have led to feeling less guilty and less afraid. Further, it can be proposed that guilt and fear are attenuated since shared reality makes people feel less lonely (Pinel et al., 2006), a hypothesis

that should be studied further, by examining whether a diminished sense of loneliness acts as a mediator to feelings of guilt and fear.

Hypothesis 5:

Hypothesis 5 was not supported.

There was not a significant difference in the security cluster (or any other) of the MAQ attachment questionnaire. It was predicted that shared reality would promote secure attachment, as one measure of connectedness to others. A well-validated and sensitive measurement (MAQ) was used in this study under the assumption that the shared reality effect that was elicited would be powerful enough to affect participants' general rating of attachment. Based on the research and theory of shared reality that was discussed, it is still believed that shared reality should promote higher sense of secure attachment. However, it seems that the manipulation in the current study was not powerful enough. Although attachment is considered to be a consistent trait that is affected by situational states (Ravitz et al., 2010), the state of shared reality that was induced in this study was perhaps not powerful enough. Future studies should address this hypothesis with a more powerful manipulation of shared reality, such as a free-verbal sharing that would be more realistic and hence, potentially, more powerful, which might produce the effect that was expected in this study.

Research question 2:

The prediction of this research question was supported.

As predicted, the order effect, which was found consistently in the first two experiments, disappeared in the second one ($t(238) = 1.50, p = 0.134$). Since the

images in this study were neutral there seemed to be no reason for habituation—the images did not illicit a strong emotional reaction and hence there was no intensity to be diminished. This finding situates the order effect as an independent emotional regulation mechanism that decreases the intensity of emotional reactions to negative stimuli, but disappears in neutral stimuli. Taken together, study 1 and study 2 identified two independent but connected mechanisms that affect emotional regulation: shared reality and order. While shared reality was found to intensify negative stimuli, and was found not to have any effect on ambiguous ones; the order of the stimuli was found to diminish participants' negative ratings of intensity (but less so in the shared reality condition, which was found to maintain the intensity despite the order effect in study 1), and, similarly to shared reality, had no effect for ambiguous stimuli. Similarly to shared reality, future studies should focus on the order effect in positive stimuli as well in order to understand it better.

CHAPTER V: GENERAL DISCUSSION

The current research used an experimental paradigm from the social-cognitive tradition to examine several clinically relevant questions regarding emotional experience and regulation. I was interested in the interpersonal aspects of emotional sharing and regulation and used a well-established experimental paradigm and concept from social psychology—shared reality—to study emotional processes of regulation and experience. Influenced by ideas from relational psychoanalysis and developmental psychology, this series of studies sought to examine empirically how sharing affects emotional processes, an area of investigation that still lacks empirical support (Rime, 2009). In addition, this series of studies sought to bridge the gap between social and clinical psychology, a relatively rare occurrence in contemporary psychology.

The result is an initial, rudimentary story about the effects of shared reality on emotional processes and a new, and perhaps robust, experimental paradigm that was replicated in the current research and can be replicated further in future research. The fundamental and necessary conditions of shared reality were preserved in this research, and several new components were added to create a new experimental situation of shared reality that is relevant to the study of emotional processes. In what follows, I would like to briefly summarize and discuss the findings from both studies, discuss their limitations, and the possibilities for future research.

The main finding of the current research is that shared reality intensifies and maintains emotional reaction to negative stimuli. In addition, the study suggests a

possible mechanism of operation through which shared reality might function in general, and produce the effect that was found in this study in particular. Specifically, current research suggested that shared reality affects emotional processes by making stimuli or aspects of the perceived reality seem more relevant (and thus more accessible; Eitam & Higgins, 2010).

The literature regarding the effects of sharing on emotional reactivity and regulation is limited and, perhaps even more importantly, lacks consistent empirical support: there is no consensus on the effects of sharing on emotional experience (even about the basic question of whether the effects are positive and regulatory, or negative/non-existent; Rime, 2009). On the one hand, some researchers emphasize the many psychological and health benefits of disclosure and sharing of emotions with others (e.g., Pennebaker & Seagal, 1999; Pennebaker et al., 2001). Clinical theorists point to the benefits of validation and sharing of one's emotions in a safe, accepting, and attuned manner with a caregiver to healthy development (e.g., Linehan, 1993; Stern et al., 1985; Stern, 2000), and some believe that this validated, attuned manner of sharing creates the ability to regulate one's emotions and is the central task of psychotherapy (e.g., Schore, 2009; Tronick, 2009).

On the other hand, however, the empirical evidence is limited and not consistent. It seems that researchers agree on the long-term benefits of disclosure and sharing, but there is not enough data on immediate consequences of sharing. For example, we now know that debriefings after traumatic events have no efficacy in reducing symptoms (Arendt & Elklit, 2001; Rose & Bisson, 1998; Van Emmerik, Kamphuis, Hulsbosch, & Emmelkamp, 2002). The outcome of patients' self-

disclosure to their therapists has also been questioned and is considered to be inconsistent and dependent upon multiple variables (Farber, 2006). The idea that expression of distress has an immediate and direct effect of relief (i.e., “the venting hypothesis”) has not been supported empirically either (Kennedy-Moore & Watson, 1999). Perhaps even more strikingly, some studies claimed that sharing emotional reactions to a distressful event even with an empathic listener has no effect on emotional arousal (Nils & Rime, 2008). What seems to be consistent, however, is the finding that cognitive work or load, in both sharing and not sharing situations has a regulating effect. The evidence that cognitive load decreases emotional reactivity is consistent across studies—when people use their cognitive capacities more, the intensity of their emotional reactions diminishes (Kron et al., 2010; Rime, 2009).

The current research is in line with the empirical data that suggests that sharing in itself does not regulate negative emotional responses; on the contrary, this research showed that shared reality intensifies emotional reactions to negative stimuli. In addition, since there was no apparent difference in terms of cognitive load (Kron et al., 2010) in the shared reality and the not-shared reality conditions, findings of current research are in line with the cognitive work/load hypotheses and do not reject them.

Taken together, study 1 and 2 of the current research not only show the effect of shared reality on perceived emotional intensity, but also propose a possible mechanism through which shared reality operates. Study 2 showed that participants in the shared reality condition viewed the images as more relevant. It seems possible, then, that in a situation of shared reality stimuli that constitute subjects’

perceived reality become more relevant (and thus accessible). The enhanced relevance that people achieve in a shared reality situation might explain the difference between the results in study 1 and 2: the negative stimuli in study 1 seemed even more negative under the condition of shared reality, as perhaps its negativity became more relevant and accessible; however, the neutral and ambiguous stimuli of study 2 did not become less (or more) neutral or ambiguous, because what became more relevant was precisely the stimuli's neutrality and ambiguity. Thus, in study 1 shared reality intensified the emotional reactions to the images, while in study 2 it had no such effect. Also, study 2 showed a minimal ($p = .06$) trend in a predicted direction that proposed that shared reality makes people more certain in their perception of reality. This proposition is well supported by literature (e.g., Hardin & Higgins, 1996) and it is believed that the fact that the current study showed only a minimally significant trend in that direction is a result of an underpowered (due to experimental constraints and especially to computerization) manipulation of shared reality. It is believed that future studies that will employ a more realistic manipulation of shared reality (and thus a more powerful one) will show this effect to be significant.

Findings of the current research might also explain why sharing a troubling event with an empathic, validating listener (Nils & Rime, 2008) does not necessarily regulate one's emotional reaction to a particular event. If the situation that is created with the listener is a shared reality situation, current research suggests that we should expect an immediate intensification rather than regulation of the emotional reaction. Perhaps, in the studies that showed an intensified emotional

reaction following sharing (see Nils & Rime, 2008), participants created a shared reality situation in which what was shared seemed more relevant to the sharers, became more accessible to them, and thus was intensified. Since in study 1 both the shared reality condition and the not shared reality condition were situations of sharing, it showed that shared reality has a unique intensifying effect, perhaps above and beyond regular sharing; although this proposition will have to be examined further in future studies. In the future, we can distinguish sharing situations between shared and not shared reality, and, based on current research, can expect different regulatory effect between the situations: it would be predicted that the shared reality situation would be more intensifying than the not-shared reality sharing situation.

In short, findings of current research are consistent with the literature that suggests that sharing is not an immediate regulating strategy. Achieving shared reality with another person creates a perception of reality that highlights its relevant aspects and in a case of an emotional reaction to a negative event this could mean an immediate intensification of that reaction. The adaptive function of sharing is in creating a reliable and valid representation of the world (Hardin & Higgins, 1996). This study suggests that this representation does not have immediate (i.e., in the moment) regulating effect; however, the regulating effects of (validated) sharing seem to be long-term and essential for psychological health (Fonagy & Target, 1997; Linehan, 1993; Stern, 2004). The lack of difference between the affective and categorical labeling conditions in this study might suggest that shared reality operates whenever *anything* relevant about the stimulus/reality is shared.

Current findings should serve as a cautionary sign to psychotherapists that encourage clients to share. It seems that the saying “it will get worse before it gets better” might be appropriate to the regulatory effect of sharing, as based on current findings (and some previous research), sharing intensifies immediate emotional reactions perhaps before it has a longer-term regulating effect (Stern, 2004; Stern et al., 1985). It should be noted that the paradigm of this study examined the effects of sharing to an anonymous audience (a common operationalization in shared reality research). It is plausible that the effect that was found would change as a result of the audience (i.e., with whom the reality is shared), type of sharing (current paradigm used set categories; other paradigms could use more free-form categories), and the audience reaction (beyond success/failure that was studied in the current research). All these possibilities are exciting paths for future research and each one of them represents a potential future manipulation of shared reality that should expand our knowledge of this concept. Nonetheless, and despite the limitations of this study, based on its initial findings researchers and clinicians would benefit from taking note of the immediate intensifying effects of sharing that were shown in the study, just as they should consider the multiple and differential outcomes of self-disclosure in psychotherapy in general (Farber, 2006).

A somewhat more disappointing result of the current research was its relative lack of findings in terms of the effects of shared reality on emotional well-being. It was predicted that shared reality would elevate participants’ measures of secure attachment. As was discussed, clinical theory and research emphasize the importance of validated sharing to healthy development in general, and a

development of secure attachments to others in particular (Fonagy & Target, 1997; Mikulincer & Shaver, 2010). Thus, it was predicted that even if shared reality intensifies negative emotional reactions it should still enhance a global (and general, i.e., not specific) sense of secure attachment. Since shared reality makes people feel less lonely and more connected to others (Hardin & Higgins, 1996; Pintel, 2006), it was predicted that a creation of shared reality—even though the sharing was operated through a computer with an anonymous audience—would result in an increase of an internal, global sense of secure attachment (i.e., not to specific people like parents or spouse, but as a general internal state; Ravitz, et al., 2010). As was also discussed, this research used a particular measure that was evaluated to be sensitive enough and general enough (not focusing on particular attachments) to detect such an effect if in fact it exists. However, such an effect was not shown, despite the sensitivity of the measure and the common relation to attachment as a “state-trait,” i.e., a trait that can be affected by temporary emotional states (Ravitz et al., 2010). It is believed that the reason for not finding any effect of shared reality on attachment was that the shared reality situation that was created was not powerful enough, or that the connection that was created with the imagined audience was not strong enough. I believe in the validity of the prediction of this study, as it is based so heavily on vast clinical theory and research, but it seems that in order to find an effect of shared reality on attachment, a more powerful manipulation of shared reality, perhaps a manipulation that will examine sharing to real/known people to the participant or sharing in a freer, more realistic manner, is needed. Alternatively,

a measure of attachment that is more sensitive to “state” rather than “trait” might also show this hypothesized effect.

However, some important findings regarding the effects of shared reality on aspects of emotional well-being emerged in this research. The study showed that shared reality makes people feel less afraid and less guilty. As was discussed earlier, guilt was shown to be more intensely elicited when emotional events are not shared with others (Finkenauer & Rime, 1998; Rime, 2009), while fear was shown to be an emotion that is elicited more when people are alone (Scherer, Wallbott, Matsumoto, & Kudoh, 1988; Fischer et al., 2003). Thus, it was proposed that these two negative feelings were diminished because shared reality makes people feel less lonely (Hardin & Higgins, 1996; Pinel et al., 2006). The connection between shared reality and fear and guilt, and the possible mediation of diminished sense of loneliness, are all exciting possibilities for future research. Based on this research and previous findings, it would be reasonable to predict that shared reality makes people feel less afraid and guilty because it makes them feel less lonely, which is a question that should be directly addressed in the future.

The combined findings of study 1 and 2 suggest that clinicians should be aware of the potential effects of a shared reality situation with their patients. If indeed such a situation was created (Echterhoff et al., 2009) the clinician might expect that if the themes that are discussed with the patient have a negative emotional valence, the patient might experience an intensification of her perceived emotions, and that this intensification will be sustained for a longer time by shared reality (i.e., the habituation of the feelings—the order effect in this study—would

decrease). While not necessarily a negative outcome, the awareness of the intensification of emotions seems important, as so frequently clinicians are encouraging patients to share their emotions and experiences. Current research would propose that clinicians might benefit from assessing whether they are creating shared reality with their patients (by following the four requisites for creating shared reality that were discussed; Echterhoff et al., 2009), and if indeed so, they should be aware of the potential consequences. As so much of current clinical literature is focusing on the regulatory aspects of psychotherapy (e.g., Linehan 1993; Schore, 2009), current research proposes that the immediate effects of sharing, in a shared reality situation, might complicate that task and might increase the emotional intensity of the negative emotional experience in therapy, perhaps before it is regulated over time. By no means a negative consequence, this study suggests that the potential elevated intensity should be expected and worked with in psychotherapy: when patient and therapist achieve shared reality they might expect to experience more intense emotions, which, even if negative, might be very beneficial, especially for affect-focused treatments that seek to elicit such emotions (e.g., Schore, 2009).

The current research also shows that shared reality makes people feel less afraid and guilty. This seems important to the clinical situation as well, and perhaps suggests a potential nuance to the perception of the therapy situation as a “safe space;” it would be suggested by current research that the therapy situation might be perceived by the patient as safe, as long as there is shared reality between her and her therapist. The reduced sense of loneliness in a shared reality situation

(Hardin & Higgins, 1996; Higgins, 1992) and the perceived commonality seem to be especially appropriate therapeutic goals that, it would be postulated by current research, have the potential to make the psychotherapy feel safe for the patient who will feel less afraid and guilty with a therapist with whom she shares reality.

Limitations and directions for future research:

The main limitation of the current study was the use of a computerized response instead of an actual person. As mentioned, shared reality research so far has been done in computerized paradigms, without an actual person with whom participants share reality (Echterhoff et al., 2009). The main reason for the use of this computerized paradigm is that shared reality effect disappears when participants share with people they perceive to be from an out-group (Echterhoff et al., 2005, 2008). Since it is almost impossible to completely control the group effect in real and not computerized interactions for every participant—for example, would a participant in the current research perceive another participant from an opposite gender as in or out group?—shared reality research in general and in this research in particular, has employed a computerized paradigm. Also, it is notable that this paradigm had achieved significant effects in the past and achieved some significant and important effects in the current research, as well.

There are two main limitations for using a computerized paradigm instead of a real person. First, participants would be always suspicious (and especially participants that have a background in experimental psychology) of such a manipulation and would suspect that there is not any other participant, if they do not see him/her. This tendency to suspect might have been even higher in the

current research, as participants were led to believe that their emotional reaction matches someone else's, which to a certain degree might be more difficult to believe than the previous, more modest perhaps, manipulations of shared reality (e.g., the "other participant" liking/not-liking a target of communication). The percentages of "believers" in the current research were described earlier. Also, and based on the manipulation check of the first study, an additional "boost" was added in the form of Google-chat, which seemed to make the manipulation more believable. Nonetheless, to eliminate the suspicion completely a real person should be used as the target of sharing. It seems that in the paradigm of the current research, which is based on emotional sharing, perhaps it is worth doing so despite the risk of in/out group "noise" effects, as it is very important to make the situation seem realistic—to imitate emotional sharing in real life.

An additional limitation of using a computerized paradigm is that it potentially diminishes the power of the manipulation of shared reality. It seems reasonable (although there is not empirical evidence for that proposition in the shared reality research) that sharing with a real person and not a computer would be experienced as more powerful for participants. This possibility might be especially important in the exploration of the effects of shared reality on attachment and well-being. As mentioned, the theoretical foundation for the prediction of these effects, as well as the prediction of increased certainty in a situation of shared reality, seems rather robust; thus, the lack of them in current findings might be explained by an underpowered manipulation. This would provide an additional

reason for the use of a real person rather than a computer as a target of sharing in future studies of shared reality and emotional processes.

Another possible improvement of the manipulation of shared reality that was employed in the current research might be allowance of a more free-form sharing (e.g., a free-verbal depiction of the images and not a forced choice). Constricted by the considerations of experimental control and operationalization, a paradigm that forced the participants to choose a category from a particular set was introduced in study 1 to make sharing as uniform as possible for all participants. Although this paradigm was expanded in study 2 to create a more continuous (rather than categorical) experience of sharing, it still operated as a forced choice rather than a free format. In the future, and risking less control of the manipulation, research should examine shared reality in a freer, more realistic format. This seems especially important when studying the effects of shared reality on emotional processes.

The current research examined the effects of shared reality only on negative and ambivalent emotional stimuli, as I was mostly interested (for clinical purposes) in these emotional categories. However, an exploration of the effects of shared reality on positive stimuli should enrich our understating of the effects of shared reality on emotional processes. The specific predictions—based on previous and current research—regarding the possible effects of shared reality when reactions to positive emotional stimuli would be shared were discussed earlier, and they could be an additional focus for future research.

As an essentially exploratory research paradigm, the current research did not focus on particular clinical populations. Perhaps it is still too soon in the evolution of the research of shared reality: there is much in the mechanism of shared reality that still needs to be investigated, especially in its relation to emotional processes. However, as a more distant goal, shared reality should also be examined with particular clinical populations. Since shared reality is hypothesized to reduce loneliness and promote connection (Higgins, 1992; Hardin & Higgins, 1996), it seems an especially fitting concept and paradigm to examine with populations such as those that suffer from depression or severe attachment disorders.

In summary, the paradigm that was introduced in the current research represents an initial attempt to connect the shared reality concept with emotional, clinically relevant, themes. It is believed that clinicians would benefit from considering whether the different situations of sharing with their patients are situations of shared reality. As was discussed, the current research suggests several possible effects that such a situation might produce and to which clinicians should be aware. Further, it is believed that similarly to the use of virtual reality in studies of trauma (Olasov-Rothbaum et al., 2004) the paradigm that was introduced in the current research could be easily applied to study emotional reactions of patients in psychotherapy. Current research proposed an experimental situation that could be easily replicated, creating a potential 'portable lab' to study the effects of sharing in psychotherapy (or elsewhere) on patients' emotional experience and regulation. Whether with a use of a computer, or in a more free form of sharing, patients and therapists can follow the four conditions of shared reality, create it, and examine the

emotional effects of such situations. Further, the paradigm of shared reality that was advanced in this research suggests a potential theory of emotional reactions of patients and thus can provide a framework of understanding patients' emotional reactions. A mutual exploration, with patients, of such reactions in a 'portable lab' of shared reality might be beneficial for both the patient and the therapist. It seems that such an exploration would be in line with the contemporary practices and emphasis of the interpersonal/relational psychodynamic school that emphasizes mutuality and sharing of meaning between therapist and patient. It is believed that shared reality is a specific, experimentally derived, situation of an interpersonal creation of meaning through sharing and also an experimental paradigm that can test its effects.

This paradigm seems to be an appropriate template that could be modified and restructured in various manners in the future, as it was throughout this research, to better understand the effects of shared reality on emotional processes. Perhaps it would be especially important to direct future research to focus on the emotionally relevant information people share (building upon the examined comparison between affective and categorical conditions in this research), how it is done (expanding upon the "relevance and certainty" mechanism that was proposed in this research), and what other emotional variables are affected by shared reality (adding other variables to the ones studied in this research). I hope that the current research will stimulate further study of shared reality in relation to emotional experience and regulation and will help us understand better how sharing our reality with others affects our emotional world.

References

- Amit, E., Algom, D., & Trope, Y. (2009). Distance-dependent processing of pictures and words. *Journal of Experimental Psychology: General*, *138*(3), 400-415.
- Asch, S. E. (1952). *Social Psychology*. Englewood Cliffs, NJ: Prentice-Hall.
- Arendt, M., & Elklit, A. (2001). Effectiveness of psychological debriefing. *Acta Psychiatrica Scandinavica*, *104*, 423-437.
- Bar-Tal, D. (2000). *Shared beliefs in a society: Social psychological analysis*. Thousand Oaks, CA: Sage.
- Baumeister, R.F., Leary, M.R. (1995). The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*, 497-529.
- Beck, A.T. (1972) *Depression: Causes and treatment*. Philadelphia: University of Pennsylvania Press.
- Beebe, B., Knoblauch, S., Rustin, J., & Sorter, D. (2005). *Forms of intersubjectivity in infant research*. New York: The Other Press.
- Bleiberg, K.L. & Markowitz, J.C. (2008). Interpersonal psychotherapy for depression. In D. Barlow (Ed.), *Clinical handbook of psychological disorders* (pp. 306-328). New York: Guilford.
- Bowlby, J. (1969). *Attachment and loss: Vol.1. Attachment*. New York: Basic Books.
- Bradley, M. M., & Lang, P. J. (1999). Affective norms for English words (ANEW): Instruction manual and affective ratings. Gainesville, FL: Center for Research in Psychophysiology, University of Florida.
- Bradley, M. M., Lang, P. J., & Cuthbert, B. N. (1993). Emotion, novelty, and the startle reflex: Habituation in humans. *Behavioral Neuroscience*, *107*(6), 970-980.
- Breuer, J. & Freud, Z. (1893). Case Histories from Studies on Hysteria. The Standard Edition of the Complete Psychological Works of Sigmund Freud, Volume II.
- Bromberg, P. (1998). *Standing in the spaces*. New York: Psychology Press.
- Carver, C. S. (1997). Adult attachment and personality: Converging evidence and new measure. *Personality and Social Psychology Bulletin*, *23*, 865-883.
- de Vignemont, F., & Singer, T. (2006). The empathic brain: How, when, and why? *Trends in Cognitive Sciences*, *10*, 435-441.

- de Waal, F. (2008). Putting the altruism back into altruism: The evolution of empathy. *Annual Review of Psychology, 59*, 279–300.
- Echterhoff, G., Higgins, E.T., & Groll, S. (2005). Audience-tuning effects on memory: The role of shared reality. *Journal of Personality and Social Psychology, 89*, 257–276.
- Echterhoff, G., Higgins, E.T., Kopietz, R., & Groll, S. (2008). How communication goals determine when audience tuning biases memory. *Journal of Experimental Psychology: General, 137*, 3–21.
- Echterhoff, G., Higgins, E.T., & Levine, J.M. (2009). Shared reality: Experiencing commonality with others' inner states about the world. *Perspectives on Psychological Science, 4*, 496-521.
- Echterhoff, G., Lang, S., Krämer, N., & Higgins, E.T. (2009). Audience-tuning effects on memory: The role of audience status in sharing reality. *Social Psychology, 40*, 150–163.
- Eitam, B. & Higgins, E. T. (2010). Motivation in mental accessibility: Relevance of a Representation (ROAR) as a new framework. *Social and Personality Compass, 4*(10), 951-967.
- Farber, B.A. (2006). *Self-Disclosure in Psychotherapy*. New York: Guilford Press.
- Festinger, L. (1950). Informal social communication. *Psychological Review, 57*, 271-82.
- Finkenauer, C., & Rimé, B. (1998). Socially shared emotional experiences vs. emotional experiences kept secret: Differential characteristics and consequences. *Journal of Social and Clinical Psychology, 17*, 295–318.
- Fischer, A.H., Manstead, A.S., & Zaalberg, R. (2003). Social influences on the emotion process. *European Review of Social Psychology, 14*, 171-201.
- Fonagy, P. (2001). *Attachment theory and psychoanalysis*. New York: Guilford Press. Chapter 2: Key Findings in Attachment Research, pp. 19-46.
- Fonagy, P., & Target, M. (1997). Attachment and reflective function: Their role in self-organization. *Development and Psychopathology, 9*, 679-700.
- Fonagy, P., Target, M., Gergely, G., Allen, J.G., Bateman, A.W. (2003). The developmental roots of borderline personality disorder in early attachment relationships: A theory and some evidence. *Psychoanal. Inq., 23*, 412-459.

- Freud, S. (1930). *Civilization and its discontents*. The standard edition of the complete psychological works of Sigmund Freud, Volume XXI (1927-1931), 64-149.
- Gallese, V. (2003). The roots of empathy. The shared manifold hypothesis and the neural basis of intersubjectivity. *Psychopathology, 36*, 171-180.
- Gallese, V. (2005). Embodied simulation: From neurons to phenomenal experience. *Phenomenology and the Cognitive Sciences, 4*, 23-48.
- Greenberg, J., & Mitchell, S. (1983). *Object relations in psychoanalytic theory*. Cambridge, MA: Harvard University Press.
- Hardin, C. D., & Higgins, E. T. (1996). Shared reality: How social verification makes the subjective objective. In R. M. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition: The interpersonal context* (Vol. 3, pp. 28-84). New York: Guilford Press.
- Hatfield, E., Cacioppo, J.T., & Rapson, R.L. (1994). *Emotion contagion*. Cambridge, United Kingdom: Cambridge University Press.
- Hausmann, L.R.M., Levine, J.M., & Higgins, E.T. (2008). Communication and group perception: Extending the “saying is believing” effect. *Group Processes and Intergroup Relations, 11*, 539-554.
- Herman, J. (1992). *Trauma and recovery*. New York: Basic Books.
- Higgins, E.T. (1992). Achieving “shared reality” in the communication game: A social action that creates meaning. *Journal of Language and Social Psychology, 11*, 107-131.
- Higgins, E.T. (2012). *Beyond pleasure and pain: How motivation works*. New York: Oxford University Press.
- Higgins E.T., Franks B., Sehnert S., Manely, K., & Pavarini, D. (2013), Expressed Likelihood As Motivator: Creating Value Through Engaging What's Real. *Journal of Economic Psychology, 38*, 4-15.
- Higgins, E. T., & McCann, C. D. (1984). Social encoding and subsequent attitudes, impressions, and memory: “Context-driven” and motivational aspects of processing. *Journal of Personality and Social Psychology, 47*, 26 -39.
- Higgins, E. T., McCann, C. D., & Fondacaro, R. (1982). The “communication game”: Goal-directed encoding and cognitive consequences. *Social Cognition, 1*, 21-37.

- Higgins, E.T., & Pittman, T.S. (2008). Motives of the human animal: Comprehending, managing, and sharing inner states. *Annual Review of Psychology*, *59*, 361–385.
- Higgins, E. T., & Rholes, W. S. (1978). “Saying is believing”: Effects of message modification on memory and liking for the person described. *Journal of Experimental Social Psychology*, *14*, 363–378.
- Horvath, A. O. (2000). The therapeutic relationship: From transference to alliance. *Journal of Clinical Psychology: In Session*, *56*(2), 163-173.
- Horvath, A. O., & Bedi, R. P. (2002). The Alliance. In J. Norcross (Ed.), *Psychotherapy Relationships That Work: Therapist Contributions and Responsiveness to Patients* (pp. 37-70). New York: Oxford University Press.
- Jaycox, L. H., Foa, E. B., & Morral, A. R. (1998). Influence of Emotional Engagement and Habituation on Exposure Therapy for PTSD. *Journal of Clinical and Counseling Psychology*, *66*(1), 185-192.
- Kennedy-Moore, E., & Watson, J. C. (1999). *Expressing emotion: Myths, realities, and therapeutic strategies*. New York: Guilford.
- Kernberg (2004). Contemporary controversies in psychoanalytic theory, techniques, and their applications. New Heaven: Yale University Press.
- Kim, Y., & Carver, C. S. (2007). Frequency and difficulty in caregiving among spouses of individuals with cancer: Effects of adult attachment and gender. *Psycho-Oncology*, *16*, 714-723
- Kim, Y., Carver, C. S., Deci, E. L., & Kasser, T. (2008). Adult attachment and psychological well-being in cancer caregivers: The mediational role of spouses' motives for caregiving. *Health Psychology*, *27*, 144-154.
- Kircanski, K., Lieberman, M.D., Craske, M.G. (2012). Feelings into words: contributions of language to exposure therapy. *Psychological Science*, *23*(10), 1086-1091.
- Kopietz, R., Echterhoff, G., Niemeier, S., Hellmann, J.H., & Memon, A. (2009). Audience-congruent biases in eyewitness memory and judgment: Influences of a co-witness' liking for a suspect. *Social Psychology*, *40*, 138–149.
- Kopietz, R., Hellmann, J.H., Higgins, E.T., & Echterhoff, G. (2010). Shared-reality effects on memory: Communicating to fulfill epistemic needs. *Social Cognition*, *28*, 353-378.
- Kron, A., Schul, Y., Cohen, A., & Hassin, R. (2010). Feelings don't come easy: Studies

- on the effortful nature of feelings. *Journal of Experimental Psychology: General*, 139(3), 520-534.
- Lang, P. J. (1980). Behavioral treatment and bio-behavioral assessment: Computer applications. In J. B. Sidowski, J. H. Johnson, & T. A. Williams (Eds.), *Technology in mental health care delivery systems* (pp. 119–137). Norwood, NJ: Ablex Publishing.
- Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (2005). *International Affective Picture System (IAPS): Instruction manual and affective ratings* (Technical Report No. A-6). Gainesville, FL: Center for Research in Psychophysiology, University of Florida.
- Levenson, E.A. (2010). The schism between "Drive" and "Relational" analysis. *Contemporary Psychoanalysis*, 46(1), pp. 7-9.
- Lieberman, M.D. (2007). Social cognitive neuroscience: A review of core processes. *Annual Review of Psychology*, 58, 259-289.
- Lieberman, M. D., Eisenberger, N. I., Crockett, M. J., Tom, S., Pfeifer, J. H., Way, B. M. (2007). Putting feelings into words: Affect labeling disrupts amygdala activity to affective stimuli. *Psychological Science*, 18, 421-428.
- Lieberman, M. D., Inagaki, T. K., Tabibnia, G., Crockett, M. J. (2011). Subjective responses to emotional stimuli during labeling, reappraisal, and distraction. *Emotion*, 11(3), 468-480.
- Linehan, M. M. (1993). *Cognitive-Behavioral Treatment of Borderline Personality Disorder*. New York Guilford Press.
- Linehan, M.M., & Dexter-Mazza, E. (2008). Dialectical Behavior Therapy for Borderline personality disorder. In Barlow, D. *Clinical handbook of psychological disorders* (pp. 365-421). New York: Guilford.
- Main, M., Hesse, E., & Kaplan, N. (2005). Predictability of attachment behavior and representational processes at 1, 6, and 18 years of age: The Berkeley Longitudinal Study. In K.E. Grossmann, K. Grossmann & E. Waters (Eds.), *Attachment from Infancy to Adulthood*. pp. 245–304. New York: Guilford Press.
- Mitchell, S. & Aron, L. (1999). *Relational psychoanalysis, Vol.1: The emergence of the tradition*. Hillsdale, NJ: The Analytic Press.
- Mitchell, S., & Black, M. (1996). *Freud and beyond: A history of modern psychoanalytic thought*. New York: Basic Books.

- Mitchell, S. (1993). *Hope and dread in psychoanalysis*. New York: Basic Books.
- Mikulincer, M. & Shaver, P.R. (2010). *Attachment in adulthood: Structure, Dynamics, and Change*. New York: Guilford Press.
- Neumann, R., & Strack, F. (2000). "Mood contagion": The automatic transfer of mood between persons. *Journal of Personality and Social Psychology*, 79, 211–223.
- Nils, F., & Rimé, B. (2008). Beyond the myth of venting: Social sharing modes determine emotional and social benefits from distress disclosure. *European Journal of Social Psychology*, 42(6), 672-681.
- Ochsner, K. N., & Gross, J. J. (2005). The cognitive control of emotion. *Trends in Cognitive Sciences*, 9, 242-249.
- Olasov-Rothbaum, B., Ruef, A.M., Litz, B.T., Han, H., & Hodges, L. (2004). Virtual reality exposure therapy of combat-related PTSD : a case study using psychophysiological indicators of outcome in Taylor, S. (ed.) *Advances in the treatment of posttraumatic stress disorder* (Chapter 6). New York: Springer.
- Panksepp, J. (2009). Brain emotional systems and qualities of mental life. In D. Foa, D. J. Siegel, & M. F. Solomon (Eds.), *The healing power of emotion, Affective neuroscience, development, & clinical practice* (Chapter 1, pp. 1-27). New York: Norton.
- Pennebaker, J.W., & Seagal, J.D. (1999). Forming a Story: The Health Benefits of Narrative. *Journal of Clinical Psychology*, 55(10), 1243-1254.
- Pennebaker, J.W., Zech, E., & Rime B. (2001). Disclosing and sharing emotions: Psychological, social, and health consequences. In M. S. Stroebe (Ed.), *Handbook of bereavement research: Consequences, coping, and care* (pp.517–543). Washington, DC: American Psychological Association.
- Pinel, E.C., Long, A.E., Landau, M.J., Alexander, K., & Pyszczynski, T. (2006). Seeing I to I: A pathway to interpersonal connectedness. *Journal of Personality and Social Psychology*, 90, 243–257.
- Porges, S. (2011). *The polyvagal theory: Neuropsychological foundations of emotions, attachment, communication, and self-regulation*. New York: Norton.
- Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? *Behavioral and Brain Sciences*, 4, 515–526.
- Ravitz, P., Maunder, R., Hunter, J., Sthankiya, B. & Lancee, W. (2010). Adult attachment measures: A 25-year review. *Journal of Psychosomatic Research*,

69, 4: 419-432.

- Rizzolati, G., & Arbib, M. A. (1998). Language within our grasp. *Trends in the Neurosciences*, 21, 188-194.
- Rose, S., & Bisson, J. (1998). Brief early psychological interventions following trauma: A systematic review of the literature. *Journal of Traumatic Stress*, 11, 697-710.
- Ryan, R. (2007). Motivation and emotion: A new look and approach for two reemerging fields. *Motivation and Emotion*, 31, 1-3.
- Safran, J., & Muran. C. (2003). *Negotiating the therapeutic alliance. A relational treatment guide*. New York: Guilford.
- Scherer, K. R., Wallbott, H. G., Matsumoto, D., & Kudoh, T. (1988). Emotional experience in cultural context: A comparison between Europe, Japan and the United States. In K. R. Scherer (Ed.), *Facets of emotion* (pp. 5 - 31). Hillsdale, NJ: Lawrence Erlbaum Associates Inc.
- Schore, A.N. (2001). The effects of relational trauma on right brain development, affect regulation, and infant mental health. *Infant Mental Health Journal*, 22, 201-269.
- Schore, A.N. (2009). Right brain affect regulation: An essential mechanism of development, trauma, dissociation, and psychotherapy. In D. Foa, D. J. Siegel, & M. F. Solomon (Eds.), *The healing power of emotion, Affective neuroscience, development, & clinical practice* (Chapter 5, pp. 112-145). New York: Norton.
- Sedikides, C. (1990). Efforts of fortuitously activated constructs versus activated communication goals on person impressions. *Journal of Personality and Social Psychology*, 58, 397-408.
- Sherif, M. (1936). *The Psychology of Social Norms*. New York: Harper & Brothers.
- Stern, D.N. (2000). *The interpersonal life of the infant: A view from psychoanalysis and developmental psychology* (2nd ed.). New York: Basic Books.
- Stern, D.N. (2004). *The present moment in therapy and everyday life*. New York: Norton.
- Stern, D. N., Hofer, L., Haft, W., & Dore, J. (1985). Affect attunement: The sharing of feeling states between mother and infant by means of inter-modal fluency. In T. M. Field & N.A. Fox (Eds). *Social perception in infants* (pp. 249-268). Norwood, NJ: Ablex.

- Tronick, E.Z. (2009). Multilevel meaning making and dyadic expansion of consciousness theory: The emotional and the polymorphic polysemic flow of meaning. In D. Foa, D. J. Siegel, & M. F. Solomon (Eds.), *The healing power of emotion, Affective neuroscience, development, & clinical practice* (Chapter 4, pp. 86-112). New York: Norton.
- Todorov, A. (2002). Communication effects on memory and judgment. *European Journal of Social Psychology, 32*, 531-546.
- Tversky, B., & Hemenway, K. (1984). Objects, parts, and categories. *Journal of experimental psychology: General, 113*(2), 169-197.
- van der Kolk, B. A. (2004). Psychobiology of posttraumatic stress disorder. In Panksepp, J. (Ed.), *Textbook of biological psychiatry* (pp. 319-344). New York: Wiley-Liss.
- Van Emmerik, A. A., Kamphuis, J. H., Hulsbosch, A. M., & Emmelkamp, P. M. (2002). Single session debriefing after psychological trauma: A meta-analysis. *The Lancet, 360*, 766-771.
- Wampold, B. (2001). *The great psychotherapy debate*. NJ: Erlbaum.
- Watson, D., & Clark, L. A. (1994). The PANAS-X: Manual for the positive and negative affect schedule-Expanded Form. Iowa City: University of Iowa
- Weissman, M. M., Markowitz, J.C., Klerman, G.L. (2000). *Comprehensive guide to interpersonal psychotherapy*. New York: Basic Books.

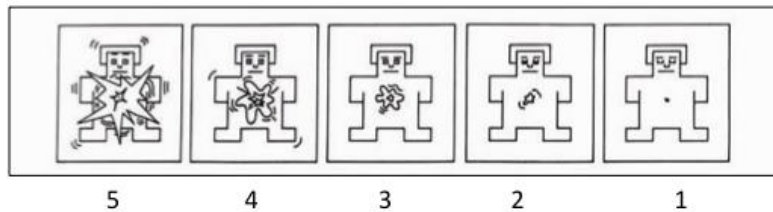
Appendix A (An Example of an IAPS Image; Langet. al., 2005)



1. Affect labeling categories: Sad, Disgusted, Scared, Angry.
2. Category labeling categories: Tool, Action, Behavior, Person.

Appendix B (SAM scale; Lang, 1980)

The scale reflects the intensity of your feelings, ranging from indifference to very intense. Please rate the intensity of your feelings during the time you were looking at the picture.



Appendix C (PANAS scale; Watson & Clark, 1994)

Directions

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate answer next to that word. Indicate to what extent you have felt this way during the past week.

Use the following scale to record your answers.

(1) = Very slightly or not at all (2) = A little (3) = Moderately (4) = Quite a bit (5) = Extremely

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1. Interested	1	2	3	4	5
2. Distressed	1	2	3	4	5
3. Excited	1	2	3	4	5
4. Upset	1	2	3	4	5
5. Strong	1	2	3	4	5
6. Guilty	1	2	3	4	5
7. Scared	1	2	3	4	5
8. Hostile	1	2	3	4	5
9. Enthusiastic	1	2	3	4	5
10. Proud	1	2	3	4	5
11. Irritable	1	2	3	4	5
12. Alert	1	2	3	4	5
13. Ashamed	1	2	3	4	5
14. Inspired	1	2	3	4	5
15. Nervous	1	2	3	4	5
16. Determined	1	2	3	4	5
17. Attentive	1	2	3	4	5
18. Jittery	1	2	3	4	5
19. Active	1	2	3	4	5
20. Afraid	1	2	3	4	5

Appendix D (MAQ; Carver, 1997)

Respond to each of the following statements by expressing how much you agree with it (if you do generally agree) or how much you disagree with it (if you generally disagree). Make all your responses on the answer sheet only. Do not leave any items blank. Please be as accurate as you can be throughout, and try especially hard not to let your answer to any one item influence your answer to any other item. Treat each one as though it is completely unrelated to the others. There are no right or wrong answers, you are simply to express your own personal feelings and opinions. Choose from these response options:

- 1 = I DISagree with the statement a lot
- 2 = I DISagree with the statement a little
- 3 = I agree with the statement a little
- 4 = I agree with the statement a lot

1. When I'm close to someone, it gives me a sense of comfort about life in general.
2. I often worry that my partner doesn't really love me.
3. I have trouble getting others to be as close as I want them to be.
4. I find it easy to be close to others.
5. I often worry my partner will not want to stay with me.
6. Others want me to be more intimate than I feel comfortable being.
7. It feels relaxing and good to be close to someone.
8. I am very comfortable being close to others.
9. I don't worry about others abandoning me.
10. My desire to merge sometimes scares people away.
11. I prefer not to be too close to others.
12. I find others are reluctant to get as close as I would like.
13. I get uncomfortable when someone wants to be very close.
14. Being close to someone gives me a source of strength for other activities.

Appendix E (An Example of a Neutral and Ambiguous IAPS Image; Lang et al., 2005)

