Affective Processing Following Romantic Relationship Dissolution

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Abstract

This study prospectively examined the emotional experiences of 58 young adult college students who had, within the previous two weeks, ended a committed romantic relationship lasting an average of 20 months. Participants completed an intake questionnaire battery and then rated their emotional experiences in a daily diary when signaled at random each day for 28 days. After the month period, participants were re-assessed with the same intake questionnaire materials. The chief aims of this study were to prospectively investigate how individuals emotionally cope with a separation experience and to examine patterns of affect regulation that are associated with better or worse psychological adjustment over time. In cross-sectional analyses, attachment security and coping self-blame and avoidance were significantly related to both the non-diary and diary outcome measures. Comparisons with a sample of individuals in intact dating relationships indicated that the experience of ending a relationship is highly dysregulating, both in terms of mean daily affect as well as observed variability in affect. Confirmatory factor analyses of the diary items revealed that the structure of affect could not be described as invariant, indicating that qualitative (rather than quantitative) change occurred in the way participants reported their emotional experiences over time.

Growth curve models indicated that each of the four diary composites evidenced significant change over time; however, the slope basis and nature of change differed for each emotion. Individual difference variables were significantly associated with the levels and slopes of these models, and the time-varying covariate of contact (with one's former partner) was strongly associated with increases in Love and Sadness within the growth models. In the final set of analyses, small but reliable sub-groups of similarly varying participants were

identified and their covariance structures were pooled for dynamic factor modeling. The bivariate factor analyses demonstrated clear evidence of cross-factor loadings both within and across time, indicating that systematic patterns of interrelations among the diary composites could be identified and modeled. Overall, the findings are discussed in terms of their contribution to the study of basic emotion and emotion regulation, as well as the implications for grieving a separation experience.

Acknowledgements

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Affective Processing Following Romantic Relationship Dissolution

If love relationships were a fiscal venture, many people would take pause before investing so wholeheartedly. Without a doubt, adult romantic relationships house opportunities for life's most enriching psychological experiences-- love, happiness, fulfillment, and satisfaction. However, what was once joyful can crumble, and the same relationships can be the source of our most painful emotional experiences, including (but not limited to) misery, despair, guilt, loneliness, and utter befuddlement. Upwards of half of all marriages in this country end in divorce (Bramlett & Mosher, 2001) and individuals in these circumstances, while perhaps obtaining some or all of the payoffs of love, are charged with negotiating the pain of relationship loss and separating from their partner. It should come as no surprise that divorce and marital separation are sandwiched between the death of a spouse and a jail term among life's most distressing psychological experiences (Holmes & Rahe, 1967). The present study seeks to develop a more complete understanding of separation experiences and to examine affective processing following the end a love relationship by studying a group of young adults who recently ended a serious dating relationship. The impetus for this work centers on melding of three related observations: (a) Divorce and the dissolution of non-marital relationships are associated with increased rates of psychological distress, yet few investigations adequately consider *how* adults grieve relationship loss, and even less work conceptualizes break-up experiences in terms of severed attachment relationships; (b) Research on loss and other stressful life events is increasingly moving from between-persons methods toward within-person research designs in order to fit better with elegant transactional coping theories; and (c) Recent methodological and statistical advances now make possible and more accessible the modeling of complex dynamical behavior.

These methods and techniques are uniquely suited for asking and analyzing process-focused research questions.

The present literature review seeks to integrate these observations in several ways. To establish the rationale and need for this type of work, the consequences of relationship dissolution are considered first. The next section includes literature from four research areas suggesting that the study of romantic relationship dissolution can both inform and be informed by work on post-divorce grief, basic emotion regulation, adult attachment, and the study of coping in general. Emery's (1994) theory of post-divorce grief is then introduced as an overarching model for the present study. The final section of this review considers literature on intraindividual variation and highlights the idea that a conceptual and practical focus on within-person research can broaden the scope of both clinical and developmental science.

Consequences of Relationship Deterioration

The unilateral or bilateral severing of a close romantic relationship can be one of life's most distressing psychological experiences (Holmes & Rahe, 1967; Kitson, 1982; Orbuch, 1992; Monroe, Rohde, Seeley, & Lewinsohn, 1999; Sprecher & Fehr, 1998; Weiss, 1988). To a large extent, the question of psychological distress following dissolution depends on the nature of the relationship. Ending a dating relationship in college or young adulthood is likely a very different experience than separating from a spouse of a decade or longer. Notwithstanding the obvious obfuscations of evaluating all separations from a similar perspective, a fundamental assumption of the proposed study is that the dissolution of non-marital dating relationships represents a suitable and feasible *analogue* to the study of affective processing that follows the termination of marriage. Hence, it is presupposed that

the underlying regulation strategies of dissolving a romantic bond are similar across the spectrum of relationship investment and that important variations in the process (e.g., duration of distress, intensity of emotions) differentiate between the end of longer-lasting partnerships and shorter-term relationships. While this assumption is an empirical question that remains to be determined, there is clear evidence that both divorce and the termination of non-marital relationships are associated with a range of distressing psychological outcomes. Moreover, in both domains, further investigation is needed into the nature of how individuals cope (or fail to cope) with the end of a relationship.

Study of the emotional and physical reactions following divorce provide the best illustrations of how the deterioration of a love relationship can adversely impact adults' well-being. Divorcing men and women commonly report elevated levels of depression, anxiety, and anti-social behavior (Amato, 2000; Hetherington & Kelly, 2002; Gotlib & McCabe, 1990; Lorenz, Simons, & Chao, 1996; Simons & Johnson, 1996). As with other forms of loss, the dissolution of a marriage is associated with decreased immune functioning and heightened vulnerability to physical illness (Kiecolt-Glaser, Bane, Glaser, & Malarkey, in press). Although many of the consequences of divorce can be viewed as causing declines in marital quality, longitudinal evidence indicates that a number of the psychological and physical correlates are specific to marital dissolution (Bruce, 1998). For example, in their four year panel study of 1,106 adults, Menaghan and Lieberman (1986) found that individuals who subsequently divorced were not significantly more depressed at the first time point than those who would remain married; however, four years later, the newly divorced had become more depressed. For both men and women, decreases in immune system functioning are associated with time since divorce (Kiecolt-Glaser et al., 1988; Kiecolt-

Glaser et al., 1987). Among their sample of 38 recently divorced men, Kiecolt-Glaser et al. (1988) reported that initiators of the separation/divorce were less distressed and had better immunological performance than did non-initiators. Among women, greater attachment to a former spouse was associated with poorer immune functioning and greater depression (Kiecolt-Glaser et al., 1987). Increased rates of illness, morbidity, and suicide are especially notable for divorced men (Burman & Margolin, 1992; Hu & Goldman, 1990; Kiecolt-Glaser & Newton, 2001). In addition to these negative consequences, there is considerable evidence that disturbed parenting practices (resulting in part from the stress of marital dissolution) place children at-risk for maladjustment (see Emery, 1999; Hetherington, Bridges, & Insabella, 1998).

Research on the dissolution of non-marital relationships mirrors the negative consequences found in the divorce literature. In their prospective epidemiological investigation of the onset and recurrence of major depressive disorder (MDD) in adolescence, Monroe et al. (1999) found that the recent break-up of a romantic relationship was a specific and unique risk factor in the onset of MDD. For young adults, the severing of romantic bonds also is associated with depression, as well as anxiety, prolonged longing for an ex-partner, and interferences with daily routines (Feeney & Noller, 1992; Fine & Sacher, 1997; Frazier & Cook, 1993; Hill, Rubin, & Peplau, 1976; Sprecher, 1994; Simpson, 1987). Save a few prospective studies (Hill et al., 1976; Specher, 1994), most of the work in this area is plagued by retrospective reports of coping; individuals are commonly asked to report weeks or months after the break-up how they felt when they ended the relationship (Simpson, 1987).

The clearest predictor of distress following a break-up is the level of closeness and commitment in the relationship prior to its dissolution. As one might expect, individuals who report closer dating relationships experience significantly more distress when the relationship dissolves (Attridge, Bersheid, Simpson, & Creed, 1995; Simpson, 1987). Perceived controllability of the break-up is also known to influence adjustment. For instance, among 90 college students experiencing the break-up of a dating relationship within the past 6 months, Frazier and Cook (1993) reported that individuals who perceived the break-up as less controllable also reported significantly more distress and that it took them more time to recover compared to individuals who felt in control of their coping responses. In terms of gender, it is not clear whether men or women fare differently with respect to their psychological adjustment after a non-marital relationship ends (for a consideration of marriage, see Kiecolt-Glaser & Newton, 2001). Although most studies report no gender differences in distress after a break-up (Frazier & Cook, 1993; Helgeson, 1994; Simpson, 1987; Sprecher, 1994), findings from the Boston Dating Couples Study indicated that at the 1-year follow-up of 15 couples who ended their relationship, men reported feeling more depressed, lonely, less happy, and less free after the break-up than their female partners. Mearns (1991) surveyed a more representative sample of 583 undergraduates who experienced a break-up after an average of 10-months dating and found that women reported significantly more depression following the end of the relationship (see also Monroe et al., 1999).

There is little argument that divorce and the termination of other long-term relationships place individuals at-risk for the development of psychological problems. Despite advances in these areas of research, few studies have examined basic emotional

processing following relationship dissolution and no work has documented individual differences in patterns of emotion regulation over time. Given the myriad ways dissolution can be stressful and emotionally unsettling, inquiry into these aspects of separation may prove to be a timely and fruitful endeavor.

Grief and Grieving: Reactions to Separation and Loss

The concept of grief has a long and rich tradition in clinical psychology and clinical lore (Averill, 1968; Freud, 1917/1957) and, as an organizing construct, grief is commonly invoked to understand the affective, cognitive, behavioral, and physiological/somatic responses that characterize how individuals cope with loss (Kitson & Zyzanski, 1987; Nolen-Hoeksema & Larson, 1999; Weiss, 2001). These responses are regarded as the cognitions and behaviors that people use to assess and reduce stress and to moderate the affective tensions that accompany stressful loss events (Billings, Cronkite, Moos, 1983; Bonanno, 2001). In their most current review of the myths of coping with loss, Wortman and Silver (2001) contend that studying how individuals grieve permanent change, such as bodily function, cognitive capacity, or the death of a loved one, provides an excellent means for examining the basic processes of stress and coping. In addition, investigators increasingly acknowledge that how individuals cope with or grieve potentially revocable losses, such as the dissolution of romantic bonds, represents an equally important area of study (Crosby, Lybarger, and Mason, 1986; Emery 1994; Hazan & Shaver, 1992; Weiss, 1974, 1988, 2001)

and one that can inform research on both attachment and emotion regulation (Fraley & Shaver, 1999; Vormbrock, 1993). [1]

A thorough understanding of grief cross-cuts many different areas of psychological science. For the present investigation, research in four key areas sheds light on how individuals may experience the end of a romantic relationship. First, a handful of investigations have examined the emotional components of divorce-related grief (that is, conceptualized divorce as a loss experience). Although compelling and thought provoking, research in this tradition suffers a number of methodological shortcomings. Second, work on adult emotion regulation underscores the fact that individuals differ with respect to how they experience and regulate affect, and such strategic differences may have important implications for how individuals negotiate the end of a relationship. Third, similar to research in the emotion regulation tradition, research on adult attachment highlights important individual differences in the way adults cope with the separation process. Finally, the larger literature on coping suggests that a developmental study of emotional processing has the potential to extend research on how individuals become affectively "stuck" following stressful life events. Although these areas of research are considered separately, the boundaries between the fields are quite porous. For example, attachment and emotion regulation are frequently considered together (Diamond, 2001), as are the topics of emotion, bereavement, and coping (Bonnano, Keltner, Holen, & Horowitz, 1995).

Post-divorce grief. Much of the empirical work on divorce-related grief is wed to Bowlby's (1980) stage-theory of grief and mourning. Bowlby's attachment theory and work

[1] In the attachment literature, a distinction is made between separation and loss, with the former being potentially temporary/revocable and the latter being permanent/irrevocable (see Fraley & Shaver, 1999).

on mourning, most fully outlined in the third volume of his trilogy, *Loss* (1980), derived mainly from a combination of psychoanalysis, control systems theory, and the field of ethology. Organized around his claim that attachment behavior characterizes humans "from the cradle to the grave," the theory holds that when a relationship is severed by loss survivors go through four stages or phases of grief/mourning: shock, protest, despair, and adaptation/reorganization (Bowlby, 1980). Weiss (1988) extended the theory by suggesting that the final phase of adaptation/reorganization includes three key processes of cognitive acceptance, emotional acceptance, and change in identity. Bowlby's work spurred much of the popular theorizing surrounding Kubler-Ross's (1969) five stages of grief: denial, anger, bargaining, depression, and acceptance. The empirical examination of these theories has led to a number of important findings, especially for the study of bereavement. At the same time, however, research invoking these principles for the study of post-divorce grief is less than satisfying, primarily because theoretical treatments of grief and grieving greatly outpace the methodological advances in this area.

Among research that has examined divorce as a grief experience, Gray and Shields (1992) used Q-sort methodology to develop an instrument measuring the psychological response to separation and divorce. Their results revealed that individuals could be roughly classified into Bowlby's (1980) phases of separation, and a strong relation was found between length of physical separation and phase classification. Individuals who recently separated or divorced were more likely classified in the "urge to recover lost object" category, while almost all participants separated or divorced for more than four years were classified as "reorganized" (Gray, 1992). In addition, the authors noted that the distinction between the phases of grieving were not altogether clear. A number of individuals were

classified as transitory (i.e., between phases) and many participants reported experiencing "symptoms" from prior phases while in the midst of a latter stage of grief resolution.

Crosby et al. (1986) used a complex 3 X 3 X 3 design to observe the progress of grief resolution in 141 participants. The model examined the affective, cognitive, and behavioral components of divorcees at three phases in time (first awareness of serious marital problems, separation or filing for divorce, and final divorce decree) based on whether the person was an active initiator of divorce, a passive agent, or a mutual player in the decision to end the marriage. While it is difficult to draw definitive conclusions from such a vast amount of data, one of the strengths of this investigation was the ability to highlight change, progression, and regression in the grief resolution process. For example, many of the adults in this sample cycled through emotions and thoughts they experienced at earlier stages of divorce process as the divorce decree became final (Crosby et al., 1986).

Crosby et al. (1986) also found important differences between active and passive divorce agents as well. Although they maintained similar affective responses at first identification of marital problems and at the final stage of divorce decree, active agents experienced primarily fear and guilt for initiating the divorce while passive agents' reactions centered on feeling hurt and sadness. Similarly, active agents' behavioral responses moved faster toward (what the authors called) reconstruction while their passive counterparts spent more time resisting the end of the marriage and negotiating the need for divorce. Other evidence supports the diverging experiences of individuals who choose to leave the marriage and those who feel they were left. For example, Thompson and Spanier (1983) and Weiss (1975) found that leaver experiences guilt and remorse and left experiences regret and rejection. Individuals whose partners suggest dissolution also are less accepting (Thompson

& Spanier, 1983), and these relations hold for several years after the divorce (Wang & Amato, 2000). Black, Eastwood, Sprenkle, and Smith (1991) further examined the post-divorce adjustment of leavers vs. the left in a sample of 45 divorcing couples. Participants who perceived themselves as the leaver were significantly more positive in their attitude toward the divorce than those who were left (Black et al., 1991).

Emotion and emotion regulation. One important aspect of the larger grief experience is the emotional sequelae of relationship dissolution (Bonanno, 2001; Bonanno & Kaltman, 1999). The break-up and ending of a love relationship can evoke a wide-range of emotions. Some people fall apart and their reactions are characterized by a whirlwind of sadness and gloom. Others simply ignore negative emotions and plod on with everyday life. Some people feel relief and happiness. While differences in affective experience need to be considered in light of the individual context of any given break-up, a growing literature indicates that certain patterns or styles of emotion regulation increase risk for subsequent psychological-- and sometimes physical-- distress (Gross, 1999; Thompson, 1994). Levenson (1999) provides a solid, common definition from which to consider emotion and emotion regulation:

> Emotions are short-lived psychological-physiological phenomena that represent efficient modes of adaptation to changing environmental demands. Psychologically, emotions alter attention, shift certain behaviors upward in response hierarchies, and activate relevant associative networks in memory. Emotions serve to establish our position vis-à-vis our environment, pulling us toward certain people, objects, actions and ideas, and pushing us away from others (pp. 481).

Following this definition, emotion regulation refers to the evocation of thoughts or behaviors that influence what emotions people have, when people have them, and how people experience and express these emotions (Gross, 1998; Richards & Gross, 2000; Thompson, 1994). One of the main problems in contemporary research on emotion regulation is that it is studied under an incredibly large number of rubrics (for example, see pp. 562 in Gross, 1999). Despite the vast purview, one integrative theme is that regulation typically occurs in the context of two classes of behavior: antecedent- and response-focused strategies (Gross, 2001). The former strategy involves upstream processes that are used in emotion generation; the latter strategy involves downstream processes to control or regulate the experience of emotions once they are occur. For example, cognitive reappraisal changes the emotional meaning of a situation (Lazarus, 1991) and would thus be considered an antecedent-focused regulation strategy. One might assume this strategy is in regular operation if, say, an individual chooses to view the end of his/her relationship as an opportunity to meet new people and engage in new activities rather than a devastating and unrecoverable loss. In contrast, response-focused strategies call for the control of an experienced emotional event. Regarding a break-up experience, a response-focused strategy would involve, for example, pretending nothing is wrong or delving into work in order to distract from potentially painful emotions. Thompson (1994) referred to these different affect regulation strategies as "emotional dynamics" that change and unfold over time. The daily study of emotions provides a unique opportunity to track and better understand the implications of response-focused regulation strategies. (Antecedent-focused strategies are best studied under more highly controlled conditions.) More importantly, process-focused

methodology can potentially capture the dynamic nature everyday emotion regulation following the dissolution of a relationship.

While it is beyond the scope of this review to consider in detail the many strategies individuals invoke to regulate their emotions, it is important to make three distinctions. First, there is growing interest in the cognitive, emotional, and physiological correlates of emotional suppression, which is defined as the conscious strategies invoked to inhibit one's own emotional expression while emotionally aroused (Gross & Levenson, 1993; Richards & Gross, 2000). The bulk of the research in this arena suggests that suppression only changes the outward expression of the emotion, and that suppressing individuals demonstrate increased rates of physiological arousal as well as increased cognitive-load when suppressing emotional states (see Richards & Gross, 1999). In short, there appears to be high emotional and cognitive costs for the suppression of strong emotions (Gross & Levenson, 1993). Second, although the literature in this area is a bit less clear, repression, or non-conscious emotional dampening, appears equally problematic. Repressive tendencies are typically operationalized as low scores on a trait anxiety measure in combination with high scores on a social desirability measure tapping defensiveness (Gross, 1999). Repressors tend to show elevated rates of physiological reactivity and stress indices when encountering an emotional experience, and these indices are common markers of increased health risk (Bonanno & Singer, 1990; Gross & Levenson, 1993). Finally, both suppression and repression can be considered in the context of larger individual differences in emotional expressivity (Gross & John, 1998). A general but accurate means of classifying patterns of expressivity suggests that individuals differ as to whether they are emotionally expressive (externalizers) or emotionally unexpressive (internalizers). An important question to emerge from the

normative study of emotion regulation is whether suppression and repression are potentially adaptive for coping with stressful life experiences. In the study of bereavement, Bonanno et al. (1995) found high levels of verbal-autonomic dissociation (i.e., avoidant coping operationalized by low reports of negative affect and high physiological arousal) were not associated with prolonged psychological distress or delayed grief. Studying daily patterns of emotion regulation provides a useful means of expanding research in this area.

Attachment and relationship dissolution. As suggested in the section on post-divorce grief, attachment theory has much to say about how adults respond when a relationship ends (Fraley & Shaver, 1999; Hazan & Shaver, 1992; Weiss, 1975, 2001). Despite the importance of separation distress as the best indicator of an attachment bond (Fraley & Shaver, 2000), strikingly little work is dedicated to decision-based termination of relationships (cf., Vormbrock, 1993). As mentioned in the previous section, Bowlby (1980) believed that normative grief involves a sequenced set of behaviors characterized primarily by protest, despair, and reorganization. Although the notion that individuals move through strict, well-delineated phases or stages following loss has received considerable criticism (Stroebe, Hansson, Stroebe, & Schut, 2001; Vormbrock, 1993), a fair amount of evidence indicates that primates and other mammals do exhibit a biphasic behavioral reaction to separation events. With respect to the sequence of mourning, Bowbly (1961) made the following observations:

> In old and young, human and sub-human, loss of love objects leads to a behavioral sequence which, varied though it be, is in some degree predictable. In human beings, moreover, the behavioral sequence is accompanied by a subjective experience which

> begins with anxiety and anger, proceeds through pain and despair, and, if fortune smiles, ends with hope (p. 331).

Functionally, Bowlby (1973, 1980) contended that the agitated responses first observed in human infants during times of separation from their primary caregiver served as biologically-based goal-directed search behaviors designed to *facilitate reunions* with the attachment figure. In adulthood, he noted that a similar phase of "yearning and searching" following the loss of a spouse was characterized by a combination of great restlessness, insomnia, preoccupation with the partner, and a vigilant scanning for their presence (Bowlby, 1980). Weiss (1975) noted that the initial separation reactions among divorcing adults are characterized by apprehensiveness, which includes panic, tension, and vigilance as its primary constituents. More recently, Weiss (2001) echoed these sentiments with respect to adult bereavement by concluding "the physiological and emotional state of protest, in which attention and energy are fully mobilized by the threat of loss, might be described as an emergency reaction" (p. 48).

Bowlby initially (1969/1982) described the second, "despair" phase of the infant separation response as resulting from the failure of protest behavior to induce the return of the lost attachment figure, and he and others suggested that a similar response characterizes adult reactions to the loss of a spouse through death (Bowlby, 1980; Parkes & Weiss, 1983). Infant reactions to prolonged separations typically include apathetic withdrawal, decreased active movement, and intermittent monotonous crying. In summarizing the research related to loss due to partner death, Hazan and Shaver (1992) concluded that for most adult mourners the realization that the loss cannot be recovered results in deep sadness, hopelessness, and

lethargy. Weiss (1975) applied similar ideas to divorce reactions and described a sense of loneliness resulting from the loss of an attachment object and the subsequent social isolation.

Any review of the attachment-related questions stemming from normative study of loss naturally evolves into a consideration of individual differences in coping. Given the strong evidence that attachment styles influence the quality of romantic relationships (Feeney & Noller, 1992; Hazan & Shaver, 1987; Simpson, 1990), it is not surprising that a number of studies have found related differences in coping with the end of romantic relationships. Birnbaum, Orr, Mikulincer, and Florian (1997) reported attachment style differences in distress among 120 Israeli adults undergoing divorce. Secure individuals in this sample reported less overt distress following the end of their marriage compared to their anxious-ambivalent and avoidant counterparts. This finding is consistent with Kobak and Sceery's (1988) and Mikulincer, Florian, and Tolmatz's (1990) descriptions of the secure person as dealing with distress by acknowledging it, searching, organizing, enacting constructive instrumental actions, and turning to others for emotional and instrumental support. Birnbaum et al. (1997) also found that anxious-ambivalent adults coped with divorce through social withdrawal and evidenced considerable self-defeating thoughts. Both coping styles were significant mediators of psychological distress. Similarly, avoidant adults became overwhelmed by negative emotions and thoughts and tended to socially withdraw following separation. Birnbaum et al. (1997) suggested that, when stressed, avoidant coping styles may mirror those of anxious-ambivalent persons, but it is likely that classification confounds limit the specificity of these findings. Simpson (1990) reported that avoidant men experience significantly less post-dissolution distress than other people and other studies have replicated

these distancing findings as well (Kobak & Sceery, 1988; Simpson, Rholes, & Nelligan, 1992).

Pistole (1995) reported that among 118 college students who ended a romantic relationship, avoidant students recalled less negativity about the end of the relationship. The author posited that their more positive response might be due to the dismissing persons' accessing attachment-related experience in a defensive manner by inhibiting the recall of attachment-related information. Preoccupied students were the most likely to feel cheated by the end of the relationship, to idealize their partner, and to actively monitor their partner's availability. Possible explanations for these differences can be seen in a unique experiment conducted by Fraley and Shaver (1997) on attachment-related thought suppression. In this study, dismissing-avoidant adults were able to suppress thoughts of their romantic partner abandoning them and attempts to suppress the attachment system resulted in decreases in psychophysiological arousal for these individuals, indicating that dismissing-avoidant adults do not simply conceal covert distress but successfully suppress attachment-related thoughts and feelings. In contrast, suppression of partner abandonment led to an increase in the accessibility of attachment-related thoughts and feelings for preoccupied adults. Fraley and Shaver (1997) argued that because preoccupied individuals are hypervigilent to attachment-related issues, it is likely that thoughts used to distract themselves from thinking about abandonment will indirectly lead them to the attachment-related thoughts they are trying to avoid. Recently, these authors (Fraley, Garner, & Shaver, 2000) demonstrated that adults with more avoidant styles tend to encode less attachment-related information (i.e., use antecedent-focused strategies), suggesting that a lack of post-dissolution distress may stem

from a general defensive tendency to give less "mental space" to attachment-related themes in memory and attention.

Coping strategies: avoidance, rumination, and temporal orientation. Research on stress and coping is one of the largest areas of inquiry in clinical and developmental science, and the study of post-relationship emotion fits squarely into the realm of how people deal with difficult life events. Individuals commonly invoke both problem- and emotion-focused strategies for handling stressful events, and research suggests that optimal coping styles consist of the largest possible repertoire of responses (Lazarus, 1991; Folkman & Lazarus, 1980). Three areas of coping research are particularly germane to the study of emotional responses following a break-up. First, at the level of theory, a conceptual shift is taking place within the coping literature with many investigators pushing for methodology that matches process-oriented theories (Folkman, 2001; Sommerfield & McCrae, 2000). Second, similar to findings in the adult attachment literature, research on coping with loss indicated that emotionally avoidant strategies may be adaptive and beneficial for a subset of individuals. Finally, investigations of temporal orientations provide instructive illustrations of how individuals can get "stuck" in the past and develop maladaptive ruminative coping strategies. Together, the theories and findings point to a need for a clearer elucidation of the characteristic ways in which individuals emotionally cope with a separation experience.

One of the chief problems in gleaning useful and pertinent information from the larger coping literature is that static approaches to stress research have received much criticism. As stated by Sommerfield and McCrae (2000): "Two decades of concentrated research have yielded relatively little of either clinical or theoretical value. The seemingly boundless enthusiasm for coping research seen in the 1980s has been replaced by widespread

disaffection, intense scrutiny, and corresponding calls for change" (pp. 620). The most widely invoked explanation for this state of affairs is the chasm between elegant transactional process theories of stress and adaptation and the methodology of coping research. In a recent series of articles (see Sommefield & MacCrae, 2000; Lazarus, 2000; Tennen, Affleck, Armeli, Carney, 2000), leaders in the field converged to suggest that most coping research to date has relied on between-person, cross-sectional designs that simply cannot capture the dynamic nature of adaptive processes. To this end, Tennen et al. (2000) offered that, "the dominance in the behavioral sciences of the nomothetic approach, in which lawful relations among variables across individuals are examined, has shifted investigators' attention away from temporally unfolding relations among variables within an individual, best captured by the idiographic approach" (pp.626). It is evident from this brief review that contemporary studies of stress and coping can benefit from more completely integrating idographic and nomothetic approaches.

While the theoretical coping literature calls for closer attention to idiographic measurement and research designs, several major findings from the nomothetic tradition are applicable to the study of relationship dissolution. A major question cross-cutting all coping research is whether psychological distress is a necessary correlate of loss. Bowlby (1980) conceptualized disordered mourning as the absence of grief (see Fraley & Shaver, 1999). He asserted that an apparent "detachment" or compulsive self-reliance was a defensive reaction that would ultimately break-down, leaving individuals vulnerable to subsequent psychological distress due to their failure to integrate memories of the lost attachment figure (Bowbly, 1980). The idea that grief "work" is a necessary prerequisite of healthy adaptation following loss has received considerable criticism in recent years (Wortman & Silver, 2001,

1989). Unlike the findings for everyday emotion regulation, the suppression of attachment-related thoughts and feelings has proven to be an adaptive strategy for coping with loss (Bonanno et al., 1997; Stroebe & Stroebe, 1991).

In their first review of the myths of coping with loss, Wortman and Silver (1989) concluded that the bulk of the research provided little support for the widely held view that individuals who fail to exhibit early distress following a loss event will show subsequent difficulties. Indeed, they found no support for the suggestion that "absent grief" is problematic or that a "delayed grief" syndrome is nearly as common as the clinical literature suggests (Wortman & Silver, 1989). Since this review, more complete empirical investigations have inquired as to the potentially adaptive nature of emotionally avoidant responses following the death of a spouse. Bonanno et al.'s (1995) study of prolonged and delayed grief syndromes indicated that avoidant dissociation was associated with minimal grief syndromes up to 14 months following bereavement. These results further support the empirically-grounded argument that emotional avoidance during bereavement may serve important adaptive functions (Rosenblatt, 1993; Shuchter & Zisook, 1993; Stroebe & Stroebe, 1987). For instance, Shuchter and Zisook (1993) reasoned that the ability to regulate or "dose" the emotional pain of a loss is highly advantageous in stressful situations that require the maintenance of a high level of functioning. Despite evidence indicating that avoidance can be adaptive, arguments persist suggesting that emotionally avoidant strategies inhibit individuals' willingness to accept the finality of loss (Horowitz, Bonanno, & Holen, 1993) and there is evidence that repressive coping styles lead to decreased immune functioning (Kemey & Gruenewald, 2000). These findings are consistent with those reported

earlier on the consequences of suppression-based emotion regulation strategies (Gross, 1999).

One obvious question to emerge from this research is whether cross-sectional methodology can adequately capture important aspects of coping. For example, ostensibly low levels of *mean* sadness or depression following relationship separation (or any loss, for that matter) may mask important variations in individual coping experiences. Some people may approach negative affect on a manageable daily basis; others may avoid strong feelings entirely. These patterns of coping are impossible to detect via cross-sectional snapshots or even standard repeated measure designs. An intraindividual approach to these questions allows for a more sensitive means of understanding different coping strategies. Individuals who completely avoid negative affect and those who experience it on an attenuated basis-- indistinguishable via mean comparisons-- may evidence considerable differences in their daily reports of emotion.

While many questions surrounding the adaptive utility of avoidant coping responses, numerous studies indicate that dysphoric cognitive-affective rumination is particularly maladaptive for dealing with loss and other stressful events. A series of studies by Nolen-Hoeksema and colleagues (Lyubomirsky & Nolen-Hoeksema, 1995; Nolen-Hoeksema, 1991; Nolen-Hoeksema, McBride, & Larson, 1997; Nolen-Hoeksema, Parker, & Larson, 1994) demonstrated that individuals who focus on thoughts and feelings associated with depressive symptoms and on the causes and consequences of these symptoms report exacerbated and prolonged distress following both naturally occurring and laboratory induced stressful events. These responses are termed *ruminative* because they passively and repetitively focus individuals on thinking about how tired and unmotivated they feel, wondering if their

problems will persist, worry about how these problems will affect their life, and generally considering negative outcomes at the expense of more positive alternatives (Nolen-Hoeksema, 1991). Among family members of recently deceased cancer patients, those who evidenced a ruminative coping style at 1 month following the loss were significantly more depressed at 6 months that those individuals with less ruminative coping styles, even after controlling for initial levels of depression and other psychosocial variables (Nolen-Hoeksema et al., 1994). Similarly, among recently bereaved men, more negative ruminative thoughts were associated with elevated depression and lowered positive morale at a 12-month follow-up (Nolen-Hoeksema et al., 1997).

The pairing of rumination and negative affect is most detrimental. Depressed mood alone does not interfere with adaptive coping strategies (see Lyubomirsky & Nolen-Hoeksema, 1995). Furthermore, rumination that focuses on the past is an equally maladaptive strategy. The notion that individuals can become "stuck" in their coping responses is both substantively important and heuristic. Holman and Silver (1998) found that among Vietnam War veterans and residents of California communities devastated by fire, individuals who focused attention to past events rather than maintaining a future orientation were more likely to experience elevated psychological distress long after the trauma itself passed. The passive and repetitive nature of ruminative strategies suggests that individuals who engage in such coping responses have inflexible means of dealing with stressful events, and this cognitive-affective response-set prevents individuals from breaking out of their maladaptive ruts (Nolen-Hoeksema, 1991). Delimiting the extent to which individuals' emotional responses get stuck following the dissolution of romantic relationships can complement findings on the cognitive aspects of past temporal orientations.

Normative Affective Processing Following Relationship Dissolution

In light of the many gaps in the existing divorce literature, Emery (1994) proposed a normative theoretical model of affective processing for understanding how individuals emotionally cope with the end of their marriage. An underlying and important component of this conceptualization is that the loss of a close romantic relationship is potentially *revocable.* This perspective differs from common conceptualizations of bereavement and physical disability that concentrate on coping surrounding permanent and *irrevocable* loss (Wortman & Silver, 2001). This distinction on the nature of the loss has important implications for the coping process. For irrevocable losses, it is assumed that coping follows a linear progression from distress to resolution. This linear progression does not preclude backsliding or experiencing conflicting emotions. Emery's (1994) model, shown in Figure 1, is organized around three main assumptions that capitalize on the potentially revocable nature of the end of romantic relationships. First, central to this model is the simultaneous existence of three competing emotions: love, anger, and sadness. Rather than a linear progression from distress to resolution, the grief process is characterized by constant cycling back and forth between the conflicted feelings of longing for a partner, being saddened by the end of the relationship, and feeling frustrated with and resentful toward this person. Second, over time, these competing emotions come into phase and diminish in intensity. Thus, the resolution of grief represents an ability to simultaneously experience the triad of emotional states. Finally, although not explicit in the figure, key differences exist in the experience of grief for the leaver and the left. The leaver's emotions are expected to be less intense because they typically evolve over the course of preparing to end the relationship. The partner who is left has had little time to prepare for the loss and experiences an elevated rate of emotional

intensity based on this suddenness. This model also allows for specific hypotheses regarding atypical patterns of emotional grief reactions. An individual who maintains, for example, elevated levels of anger and frustration with a former partner without experiencing associated feelings of longing or sadness would be described as "stuck" in anger. The predominance and maintained elevation of any one emotional state is hypothesized to portend an atypical grief reaction. Finally, it is important to underscore the theoretical nature of this model. This affective processing model of post-relationship grief was derived through experiences with divorcing couples and adults in divorce mediation (Emery, 1994).

The Emery (1994) conceptualization of grief also can be understood as a control systems theory of affect regulation (see Simpson & Rholes, 1998). From this perspective, the oscillatory nature of the model represents a person's emotional dysregulation following a separation experience. One of the primary purposes of normative attachment is the maintenance of felt security, and the importance of adult love relationships for affect regulation has been repeatedly demonstrated (Diamond, 2001; Feeny, 1995; Shaver & Fraley, 2001; Shaver & Hazan, 1994). From this perspective, the emotional disorganization that individuals frequently experience when dissolving a love relationship can be conceptualized in terms of the removal of the functional components of the attachment system. Affect regulation, then, is characterized by an effort to maintain and regain emotional homeostasis (i.e., felt security) while frequently experiencing the multiple pangs of separation distress.

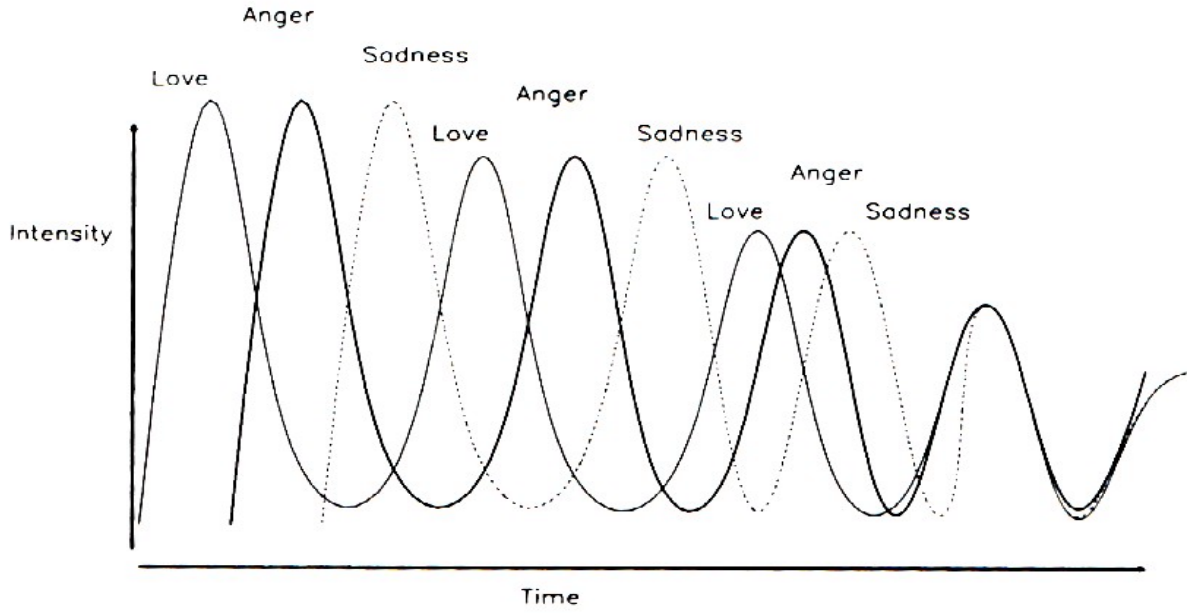

Figure 1. Theoretical model depicting cycles of love, anger, and sadness over time.

Intraindividual Variation

A fundamental tenet of the proposed investigation is that how individuals maintain and regain emotional homeostasis following the dissolution of romantic relationships is an *inherently developmental process*. Much of the literature of on bereavement and coping with loss has failed to capture the change process that necessarily operates as individuals move from distress toward resolution (Harvey, 1998; Klass, Silverman, & Nickman, 1996; Nolen-Hoeksema & Larson, 1999). This state of affairs led Stroebe et al. (2001) to conclude that "rolling film" methodology is needed to best assess the dynamics of bereavement. From a slightly different vantage point, theoretical and empirical work on intraindividual variation supports the contention that in order to understand rich developmental processes and change, researchers must adopt a focus on intraindividual variation and interindividual differences in

person-centered variation (Moskowitz & Hershberger, 2002; Nesselroade, 1990; Nesselroade & Featherman, 1991; Nesselroade & Ghisletta, in press). Within this framework, individual functioning is seen as a complex and dynamic process that cannot be captured in a single occasion of measurement. When data are summarized as group means or changes in group means, information about differential trajectories of individual change over time can be misrepresented by mean values with little substantive meaning (Nesselroade & Featherman, 1991). Consider, for example, the idea that within a given sample a small but reliable sub-group of people quickly decline in their experience of sadness following a separation experience. At the same time, another group experiences little initial sadness but instead reports more dysphoria toward the end of the study. Each pattern is demonstrable and substantively interesting; however, the mean sadness trajectory over time is flat, indicating no patterns of meaningful change. How and when post-relationship affect is measured has a number of important consequences and, potentially, substantive implications.

Given these concerns, a growing body of evidence suggests that the study of intraindividual variability is an essential endeavor for developmentalists (see Moskowitz & Hershberger, 2002). Methods for optimally conceptualizing studies of intraindividual variation are often addressed in terms of multivariate, replicated, single-subject, repeated-measure designs (MRSRM; Jones & Nesselroade, 1990; McArdle & Nesselroade, 1994). MRSRM designs aim to include enough occasions of measurement to establish patterns of within-individual variability and to include enough participants to address aspects of generalizability across individuals and between naturally occurring groups. A key theme running through this research is a concern with better understanding behavior at the individual level before performing steps to aggregate information in the service of general

lawfulness (Nesselroade & Ghisletta, in press). Statistical approaches based on these ideas enable the clustering individuals according the way they change over time and permit the evaluation of lead-lagged relationships within relatively short multivariate time series. (Nesselroade & Molenaar, 1999). Increasingly, developmental scholars and methodologists are recognizing the importance of identifying lagged relationships and pooling covariance structures to create homogenous sub-groups of people for data analysis (e.g., Kenny, 1998; Parke, 1998).

Summary and Research Hypotheses

The research reviewed here suggests that the dissolution of close romantic relationships is an important but understudied process that, across levels of relationship investment, places individuals at-risk for both temporary and prolonged psychological distress. Evidence from the divorce, emotion regulation, adult attachment, and coping literatures indicates that vast differences exist in how individuals affectively experience and deal with the end of a relationship. Each of these domains of inquiry, however, is bedeviled by relatively static conceptualizations of emotional processing following stressful events. Substantive and methodological advances to emerge from the integration of idographic and nomothetic research traditions reveal that it is now possible and feasible to capture rich features of development through the examination of intraindividual variation and change over time. The present investigation seeks to exploit these methods to better understand how individuals maintain and regain emotional homeostasis following a break-up experience. The following research questions and specific hypotheses will be examined:

Research Question 1: Descriptive analyses and mental health outcomes. What variables are associated with psychological adjustment and daily reports of emotional experience in the time immediately following a break-up and at a one month follow-up?

Hypothesis 1a: Individuals who initiate the separation will experience less nonacceptance of relationship termination and dissolution-related distress at entry into the study compared to individuals who perceived themselves as left. Individuals initiating the break-up also will report less average Love, Sadness, Anger, and more Autonomy on the daily diary.

Hypothesis 1b: Individuals who report dating their partners for a longer period of time will report more nonacceptance of relationship termination and dissolution-related distress compared to participants in a shorter relationship. Individuals ending longer relationships also will report more average Love, Sadness, Anger, and less Autonomy on the daily diary.

Hypothesis 1c: Self-reported attachment will be correlated with dissolution-related distress at entry into the study and the Day_28 follow-up. Specifically, individuals reporting a more secure attachment orientation will report less overt distress, whereas individuals reporting fearful and preoccupied styles will report more distress on the general outcome measures and more average Anger on the daily diary scale.

Hypothesis 1d: Self-reported personality will be correlated with dissolution-related distress at entry into the study and the Day_28 follow-up. Specifically, individuals reporting high neuroticism also will report elevated distress on all other outcome measures.

Hypothesis 1e: Compared to individuals in an intact dating relationship, participants who have experienced a recent break-up will evidence greater daily fluctuations in emotional

states and demonstrate greater mean levels of all negative affect items throughout the measurement period.

Hypothesis 1f: Men will report less post-relationship emotional distress and report less daily variability in emotions than women.

Hypothesis 1g: Mean variability in Love, Anger, and Sadness will be a significant predictor of the non-diary outcomes at Day_28 after controlling for mean levels of each emotional composite. Individuals reporting more variability will report significantly worse outcomes at the Day_28 follow-up.

Research Question 2: Affective structure over time. What is the underlying structure of daily affect among young adults who have recently dissolved a close romantic relationship?

Hypothesis 2a: A static three-factor affective structure of Love, Anger, and Sadness will best characterize the observed data. This structure will be invariant over time.

Research Question 3: Growth Modeling. How do the daily emotional composites of Love, Anger, Sadness, and Autonomy change over the 28-day measurement period and what covariates are associated with rates of change and the initial levels for each emotion?

Hypothesis 3a: Love, Anger, and Sadness will evidence patterns of nonlinear decline over time. In contrast, Autonomy scores will increase over time.

Hypothesis 3b: Initiator status, length of relationship, attachment security, neuroticism, nonacceptance, generalized disturbance, and dissolution-related emotional intrusion will all be significantly related to the level and slope of the Love, Anger, and Sadness composites.

Hypothesis 3c: Daily reports of contact with a former partner will have a time-varying impact on the emotional composites such that contact at any occasion will be significantly positively associated with Love, Anger, and Sadness. In contrast, contact will be negatively associated with Autonomy.

Research Question 4: Intraindividual variation. How do individuals experience their daily emotions following romantic relationship dissolution?

Hypothesis 4a: Individual differences will emerge on patterns of intraindividual variation such that empirically defined sub-groups of similarly varying individuals may be identified.

Hypothesis 4b: Among similarly varying individuals, dynamic factor models that include lead-lagged relations among factors and non-contemporaneous associations among emotions will best characterize the observed data. Cross-loadings between emotional constructs will lead to improved model fits with the data over less dynamic specifications.

Method

Participants

The participants for this study were 58 undergraduate students attending the University of Virginia who had, within two weeks prior to entering the study, ended a close dating relationship lasting longer than 4 months. Participants were recruited from a larger project (the Virginia Dating Study; VDS) that prospectively examined closeness and stability in college dating relationships. The primarily intention of the VDS was to follow individuals until their relationships dissolved. Participants in the VDS were interviewed at an initial intake and the status of their relationship was followed using a system of weekly emails. The face-valid weekly email is included in Appendix A. If individuals indicated their relationships was dissolving, they were invited to participate in the present study of daily emotions following break-ups (the Dissolution Study). Hence, a key and unique aspect of the VDS/Dissolution Study combination was the ability to be in close contact with individuals who recently ended a relationship. All 58 participants were recruited into the Dissolution Study within two weeks of stating (in the weekly emails) that their relationship was ending or had ended (M = 10.92 days, SD = 3.48 days; range = 2 – 12 days). Overall, the final sample consisted of 48 women and 10 men who were an average of 18 years and 9 months old (SD = 1 year, 1 month; range = 17 – 22 years), and reported an average of 1.5 years of college (SD = .86; range = 1 – 4 years). Four participants self-identified as Asian/Asian American, seven as African-America, three checked multiple categories, and the remained were White/Caucasian. On a categorical item, 33 of the participants indicated that they initiated the break-up; 12 reported that decision was mutual; the remainder indicated that their partner

chose to end the relationship. The average relationship length prior to the break-up was 20 months (*SD* = 13.79; *Mdn* = 19.5; range = 4 – 80 months).

In addition to participants the main Dissolution Study, a comparison sample of 30 individuals in an intact dating relationship completed the daily diary. Participants in the dating sample completed the same diary procedure as the dissolution sample with one exception; this group completed the daily diary for only 7 days (vs. 28 days for the dissolution sample) The dating sample consisted of 23 women and 7 men who were an average of 19 years and 1 month old (*SD* = 1 year, 10 months; range = 18 – 27 years), in their second year of college year of college (*M* = 2.17 years, *SD* = 1.30 year; range = 1-5 years, with 5 being a first year graduate student), and reported dating their current partner for an average of 22 months (*SD* = 16.41 months; *Mdn* = 18 months, range = 4 to 70 months). There were no significant differences between the dissolution and dating samples on age, year in school, or length of relationship.

Power. In MRSRM designs, a general aim is to include enough occasions of measurement to establish patterns of within-individual variability and to include enough participants to address aspects of generalizability across individuals and between naturally occurring groups. In the present study, 58 participants yields roughly 80% power to detect medium effects for subgroups differences in univariate analyses (Cohen, 1988). Estimating the appropriate sample size to achieve this level of power for repeated measures, small-sample covariance structure analyses is a more difficult task (see Hussong et al., 2001). Most treatments of this issue do not cover time series data and thus fail to account for power gains through intense repeated measure designs with relatively small samples (Muthen & Curran, 1997; Venter & Maxwell, 1999). Marsh, Balla, and McDonald (1988) concluded that

confirmatory factor analytic solutions can be improved by increasing the number of indicators per factor for smaller sample studies and introducing invariance constraints into the models. MacCallum, Brown, and Sugawara's (1996) emphasized that both power estimates and precision increase monotonically with sample size (N) and degrees-of-freedom (df). In the case of small sample research, this creates an often impossible situation of maintaining the traditional person per parameter (p) ratio of 2:1 (Tabachnick & Fidell, 1996). Increasingly, though, methodologists have asserted that there are no clear-cut rules for N per p as long as proper solutions can be found and caution is used when interpreting chi-squares with small samples relative to the number of parameters estimated (Marsh & Bailey, 1991).

Measures

Although the principal aim of this study was to sample the emotional experiences and psychological adjustment related to a break-up, data also was collected on self-reported attachment style, personality, and coping. The Acceptance of Relationship Termination, Impact of Event Scale, and Mood and Anxiety Symptom Checklist were administered at both the intake and exit interviews (Day_1 and Day_28, respectively). The measures are included in Appendix A.

Acceptance of Relationship Termination (ART; Kitson, 1982). The ART is a modified version of Kitson's (1982) Acceptance of Marital Termination scale consisting of 11 four-point items (from *Not at all my feelings* to *Very much my feelings*) that taps a range of thoughts feelings about accepting the end of a relationship (e.g., "I spend a lot of time wondering about my former partner") and yields a single summary score (ranging from 11 to 44) with higher scores indicating greater *nonacceptance*. The original scale was modified for application to the dissolution of non-martial relationships. The AMT is a reliable assessment

tool and correlated with both depression during the divorce process and non-custodial parents involvement following marital separation (Kitson, 1982; Emery, Mathews, & Wyer 1991; Emery et al. 2001; Wang & Amato, 2000). In the present study, ART alphas were .62 for Day_1 and .67 for Day_28, and these scores were correlated .72 over time (N = 57, $p < .001$).

Daily Diary. The daily diary contained 33 questions tapping the affective states of Love, Anger, and Sadness, and Autonomy. Participants responded to the same set of questions each day for the 28 day study period. To assess Love, Rubin's (1973) Love Scale was used, which consists of nine items rated on a 9-point scale assessing the amount of love expressed for a dating partner (e.g., "I would be miserable without him/her."; "If I were lonely, my first thought would be to seek them out."). In previous research, the Love Scale was found to have high internal consistency for both men and women (alphas >.89) and to be a strong predictor of relationship stability (Bersheid et al., 1989). Anger and Sadness were measured using items from the Profile of Mood States (POMS; Mcnair, Loor, & Droppleman, 1981) Anger and Depression scales. Participants rated the extent to which they have experienced each emotion adjective on a 5-point scale (1 = *not at all*, 5= *extremely*). The Anger scale contained nine items (angry, peeved, spiteful, bad-tempered, furious, deceived, bad-tempered, annoyed) and the Sadness scale consisted of 5 items (sad, blue, unhappy, discouraged, lonely). Nacross, Guadagnoli, & Prochaska (1984) reported reliability coefficients above .80 for these scales and several published reports indicate that the Depression and Anger scales correlate highly with other measures of the same constructs (Nyenhus, Yamamoto, Luchetta, Terien, & Parmentier, 1999). Autonomy was assessed via four items (relieved, free, courageous, strong), which were added to include coverage of the

potential positive aspects of ending a relationship.[2] No published reports have assessed the reliability or validity of these four items. On Day_1, the alpha reliabilities were .85 (Love), .89 (Anger), .80 (Sadness), and .84 (Autonomy). Collectively, there scales are referred to as the emotional composites throughout the remainder of the study. In order to ease interpretation, the summary scores were transformed to a 100-point basis, with individual scores representing a percentage of the total possible score on that scale.[3] Because the Love composite used a 9-point scale, scores ranged from 9-81, and re-scaled scores ranged from .11 to 1. For each of the other scales, the re-scaled scores ranged from .20 to 1 (see Appendix C, Table C3 for summary statistics of the diary composites).

In addition to assessing these emotions, one question was asked to determine if participants had any contact with their former partner (e.g., phone, email, or personal contact) since they last rated themselves. Participants reported an average of 12 days of contact with their former partner over the 28 days study period, which is equivalent to having some type of contact with your former partner roughly 40% of study period (SD = 7.25 days; range: 0 – 27). Contact was significantly positively associated with participants' mean Love scores (r = .41, $p < .01$, $N = 58$) and significantly negatively associated with mean Autonomy (r = -.28, $p < .05$, $N = 58$)

Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979). The IES is a 15-item questionnaire designed to assess the subjective emotional sequelae of distressing events

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[2] Due to a printing error, the dating sample diaries omitted these four items. All other aspects of the diary were the same for two samples.

[3] This type of re-scaling does not change the distribution of a variable or affect its relations to other variables. In addition, although many of the diary variables evidenced positive skew, the emotional composites were not transformed. Square-root and logarithmic transformations did not normalize the data, and given the difficulty of interpreting transformed data, the data were left in their original condition.

and symptoms that are typically associated with Post-Traumatic Stress Disorder but not specific to diagnosis of this syndrome (Horowitz et al., 1979; McDonald, 1997). Respondents are asked to rate the frequency of subjective distress for the past week on a 4-point scale ranging from *not at all* to *often*. The scale yields subscores for emotional intrusion (e.g., I thought about it when I didn't mean to; I had trouble falling asleep or staying asleep because pictures or thoughts about it come into my mind) and avoidance symptoms (e.g., I avoided letting myself get upset when I thought about it or was reminded of it; I tried to remove it from memory). Test-retest correlations for this measure are high (alpha > .85) for periods less than 2 weeks (Schwarzwald, Solomon, Weisenberg & Mikulincer, 1987) and the measure has demonstrated strong sensitivity by capturing changes in clinical presentation over time (Horowitz et al., 1979) and reflecting greater subjective distress among more traumatic experiences (Scharwzwald et al., 1987; Sudin & Horowitz, 2002). In the present study, IES alphas ranged from .67 (for Emotional Intrusion at Day_1) to .88 (for Avoidance at Day_28). The Intrusive Experiences subscale was correlated .68 ($N = 57$, $p < .001$) with itself over time and the Avoidance sub-scale was correlated .39 ($N = 57$, $p < .05$) with itself over time.

Mood and Anxiety Symptom Questionnaire (MASQ; Watson & Clark, 1991). This self-report scale asks participants to rate their experience in the past week of 90 symptom-items associated with depression and anxiety on a 5-point scale (0= *not at all*, 4= *extremely*). The MASQ is based on Clark and Watson's (1991) tripartite model of depression and anxiety and yields a number of sub-scales specific to both depression and anxiety. The strength of the MASQ rests in its sensitivity to symptoms that are characteristic of generalized affective distress and differentiate between non-bipolar mood and anxiety disorders. In the present

study, only the General Disturbance (GD) and Positive Affect (PA) scales were used. The GD scale contains 15 items that appear in the criteria for both mood and anxiety disorders (e.g., feelings of irritability and confusion; insomnia; difficulty concentrating). The PA scale contains items measuring the absence of distress (e.g., Felt cheerful; Felt like I had a lot to look forward to; Was proud of myself). Extensive psychometric evaluation of the MASQ found the GD scale to be highly correlated with different measures of the same constructs and that the anxiety and depression specific subscales differentiated between patient and non-patient samples (Watson et al., 1995). In the present study, the reliabilities ranged from .88 (for GD at Day_1) to .95 (for PA at Day_28). GD was correlated .67 ($N = 57$, $p < .001$) over time, and PA was correlated .66 ($N = 57$, $p < .001$) over time.

NEO Five-Factor Inventory (NEO-FFI; Cosrta & McCrae, 1992). The NEO-FFI is a well-validated and widely used 60-item inventory designed to assess the five major dimensions of personality: neuroticism, extraversion, openness, agreeableness, and conscientiousness. Respondents are presented with a variety of descriptive statements and asked to indicate on a 5-point scale how much the statement applies to them in general (from *strongly disagree* to *strongly agree).* The neuroticism scale assesses the general tendency to experience negative affect and experience psychological distress, and low scorers tend to be emotionally stable; extraversion assesses sociability and desires for social contact, and high scorers tend to be upbeat, energetic, and optimistic; openness (to experience) assesses individuals' willingness to entertain novel ideas and unconventional values, and high scorers generally have an active imagination and a preference for variety while low scorers tend to be more conventional; agreeableness assesses interpersonal tendencies to please others and be altruistic, and high scorers tend to be pathologically agreeable while low scorers tend to be

pathologically disagreeable; conscientiousness assess self-control and the propensity plan, be organized, and carry out tasks, and high scorers are purposeful and strong-willed while lower scorers exhibit less precision in exacting their personal convictions. The NEO-FFI is a reliable and valid in a range of clinical settings (Costa & McCrae, 1992). In the present study, 7 of the 58 participants did not complete the NEO-FFI due to a clerical error in the preparation of the questionnaire battery. Thus, NEO-FFI data was available for only 51 participants. Alpha reliabilies ranged from .48 (for agreeableness) to .68 (for neuroticism). The correlations among the NEO-FFI scales are shown in Appendix C, Table C1.

Relationship Styles Questionnaire (RSQ; Griffen & Bartholomew, 1994). The RSQ, completed by participants at the intake interview, is a 30-item measure tapping four attachment-style subscales: secure, fearful, dismissing, and preoccupied. The RSQ provides a more flexible means of assessing adult romantic attachment styles than other forced-choice methods (cf., Hazan & Shaver, 1987) and assesses individuals along two major dimensions--Anxiety and Avoidance—with respect to their working models of self (as worthy of love and support or not) and models of others (as trustworthy and available vs. unreliable and rejecting). *Secure* individuals typically endorse items indicating a sense of lovability and others as response and accepting. *Fearful-avoidance* is characterized by a sense of unlovability and an expectation that others will be rejecting and untrustworthy, while *dismissing-avoidance* involves a positive view of oneself coupled with an unfavorable and negative disposition toward others. The *preoccupied* category is conceptually similar to ambivalent attachment and involves a lack of positive self-regard and a positive and idealized view of others and relationships in general. Empirical evidence supports the existence of four-category attachment model (Bartholomew & Horowitz, 1991), and the RSQ is

consistently found to have strong test-retest reliabilities and discriminant validity (Fraley & Shaver, 1997). In the present study, alpha reliabilities ranged from .59 (for security) to .82 (for fearful-avoidance). Appendix C, Table C1 shows the correlations among the four attachment scales.

Revised Ways of Coping Checklist (RWCCL; Vitaliano, Russo, Carr, Maiuro, & Becker, 1985). The RWCCL is a widely used 57-item self-report measure designed to assess the range of cognitive and emotional strategies people use to manage stressful life events. Respondents are asked to recall a stressful situation and rate the degree to which they engage in specific coping actions on a 4-point scale (responses range from *never used* to *regularly used)*. The checklist yields eight scales, four of which are used in the present study: Problem-Focused coping (e.g., I knew what I had to do so I doubled my efforts and tried harder to make things work), Self-Blame (e.g., Realized I brought the problem on myself), Support Seeking (e.g., Accepted sympathy and understanding from someone), and Avoidance (e.g., Went on as if nothing had happened). Vitaliano et al. (1985), reported mean alphas of .80 for the RWCCL scales and concluded the measure evidences adequate construct. In addition, Mikuliner, et al. (1993) reported internal consistencies from .72 to .82 for the RWCCL scales and found patterns of emotion-focused coping differentiated between self-reported adult attachment styles. The RWCCL was administered only at the intake interview. In the present study, alphas ranged from .30 (for Self-Blame) to .80 (for Problem-Focused coping).

Procedure

This study employed a pretest-diary-posttest design. Participants in both the dissolution and dating samples completed an initial battery of questionnaire materials at an intake interview (called Day_1 throughout the remainder of this report), which occurred as soon as possible after they indicated a willingness to participate. At this interview, the practical aspects of the Experience-Sampling Method (ESM; Larson & Csikszentmihalyi, 1983) were explained and, when signaled, participants were asked to rate themselves on 33 brief mood states and two contextual questions each day for the next 27 days.[4] Importantly, individuals were told to rate their current feelings *as they experienced them at the moment they read the diary questions* and to answer all questions with respect to their feelings about their former partner (if in the dissolution sample) or current partner (if in the dating sample). Participants were given a Motorola ™ electronic beeper/signaling device and instructed to respond to all alarm signals as soon as possible. The signals would be sent at random times between 10am – 10pm, and they were told that the first signal would occur later that day.[5] Participants were asked to keep the beeper with them as much as possible, although it was recognized that having it with them at all times would be impossible and that it was acceptable to leave the device behind for special situations (e.g., an exam, a job interview, etc).

Each person was given a copy of the beeper operating instructions and all beeper programming was extensively reviewed with the participants, including how to activate the reminder "chirping" and vibrate features of the device. They were also instructed that, if

[4] Participants in the dating sample were instructed to complete the diary for next 6 days.
[5] Random times within 12-hour this window were generated in 10 minutes increments using SAS.

they missed a signal entirely or believed a signal never came for a particular day, they should rate themselves upon realizing no signal had come. Similarly, if they were late to responding to a signal (e.g., they were in class when signaled and realized two hours later), they were instructed to rate themselves as soon as they realized they missed the signal. Finally, instructions were provided on how to make diary entries should the person go out of signal range. The beeper devices were programmed to work in the local Charlottesville, Virginia area and would not receive signals if students left the general University vicinity. Recognizing that there would be instances when participants would leave town for the weekend or school recess, individuals were instructed to rate themselves on a three-day (morning, afternoon, and evening) rotating schedule starting the day after their last signal. For example, if they left town on a Sunday night, Monday would be a morning rating (when they awoke), followed by an afternoon rating on Tuesday (near lunchtime), and an evening rating on Wednesday (after dinner). This schedule was designed to permit continued diary entries and maintain the integrity of the sampling throughout the day. Participants were provided with a variety of ways to contact study personnel in case a beeper failed or if any other questions arose. After three days, participants were contacted to monitor and assist their record keeping. Diaries were collected and exchanged every two weeks. On the final day of diary measurement (called Day_28 throughout the remainder of this report) participants in the dissolution sample were re-interviewed using the initial questionnaire battery (see the *Measures* section for a list of the repeated instruments).

In terms of daily assessment, the ESM is reliable, valid, and feasible time-sampling procedure for assessing the frequency and patterning of mental processes in every-day-life situations through random signaling (Bolger & Eckenrode, 1995; Csikszentmihalyi &

Larson, 1992; Hormuth, 1987; Kubey, Larson, & Csikszentmihalyi, 1996; Hussong et al., in press; Larson & Ham, 1993; Marco, Neale, Schwartz, Shiffman, & Stone, 1999; Tennen et al., 2000). Csikszentmihayli and Larson (1987) found that the sampling accuracy of the ESM is high by comparing this method to a standard diary method and retrospective reports, observational data, peer-ratings, and questionnaire self-reports. In addition, the individual consistency of items and stability of ratings over a week are high while also being sensitive to daily fluctuations. Evaluation of the validity properties of the ESM method shows that psychological states covary in expected ways with independent measures of similar constructs, and ESM reports on emotional states and situational factors differentiate between patient and non-patient groups, dysphoric and non-distressed adolescents, and superior and average students (Csikszentmihalyi & Larson, 1992; Larson & Ham, 1993). In terms of feasibility, completion time of daily diary recordings is kept under 3 minutes to ensure minimum disruption of participants' lives. Response rates generally approach 90% of signals sent, and compared to daily diary methods asking participants to rate themselves at the same time each day, the ESM is provides an excellent means of generating random samples of mood states (Bolger & Eckenroade, 1995).

Missing Data and Signal Response

The daily sampling used in the Dissolution Study included 1,624 occasions of measurement (58 participants, 28 occasions each), generating 53,592 diary observations for the entire sample across all variables. The general approach to missing diary data was to impute scores based on the mean of the two occasions immediately prior to the missing data point and the two occasions immediately after the missing data. Given the large number of occasions, surprisingly few dairy entries were left entirely blank. Only 19 diary entries were

entirely blank (i.e., individuals recorded no responses for the entire day), which is approximately 1% of the total possible occasions of daily measurement. The low percentage of missing data is likely due to the instructions given to participants when they entered the study. The importance of making a diary entry each day was stressed, and participants were asked to rate themselves even if they missed a signal, if the beeper failed, or if they believed a signal never came. In addition to missed occasions, 97 other observations were missing; most of this missingness included emotions that were skipped in the course of completing the diary and several instances in which the final items on a page or the last page of a daily entry were missed. These occasions were handled as outlined above.

Several situations required participants to rate themselves when they did not receive a signal. The first six participants who entered the study did use beepers and they were asked to rate themselves according to the rotating schedule described in the *Procedure* section. In addition, when participants were out of town or out of beeper range they also rated themselves using this strategy. Finally, when the beeper failed or when participants believed they were not signaled, they were asked to rate themselves just before going to sleep. Overall, then, there were a great number of ways in which participants would have made a self-initiated rating, and an important question is whether this systematically influenced their reports of daily emotion. Each diary entry required participants to rate the time they were signaled and the time they rated themselves. Thus, it is possible to examine potential differences in the diary reports when participants did and did not receive a signal. Of the 1605 possible occasions (total occasions, less the number of entirely missed days), participants reported *not* receiving a signal on 496 days, which is slightly more than 31% of the total occasions (as indicated by the presence of a diary entry and no entry for the time

signaled). Unfortunately, there is no way to tell if participants received a signal but failed to make a record of the time. Effect sizes were computed for each of the four diary composites to ascertain whether scores differed when participants responded to a beeper signal vs. all other responses.[6] Table 1 shows the means, standard deviations, and effect sizes (Cohen's *d* statistic; Cohen, 1988) for each of the four diary composites. According to standard conventions, all of *d* statistics were smaller than small effect sizes (Cohen, 1988). Given a lack of difference in the emotional composites, it was concluded that diary responses did not differ when participants responded to a beeper signal or when they initiated their own response.

Table 1

Effect Sizes Comparing Diary Responses in Signal vs. No Signal Conditions

Emotional Composite	Signal (*n* =1109)	No Signal (*n* = 496)	Cohen's *d*
Love	48.65 (21.00)	50.27 (21.27)	-.076
Anger	26.67 (12.77)	26.87 (11.15)	.006
Sadness	34.62 (17.02)	33.96 (15.98)	.039
Autonomy	46.58 (21.23)	45.14 (22.27)	.066

Note. Standard deviations are in parentheses. Composite scores (which are percentages of the total possible scaled score) range from 11 to 100 for Love, and from 20 to 100 for the three other composites. Cohen's *d* was computed by dividing the mean difference between groups by σ pooled.

Data Analysis

In keeping with the main research questions, the results are reported four sections: (a) Descriptive Analyses and Mental Health Outcomes; (b) Affective Structure Over Time; (c)

[6] Given the statistical power of 1605 observations, virtually any difference between the two groups would reject the null hypothesis. Thus, effect sizes were computed to compare these samples.

Analysis of Change: Growth Modeling; and (d) Intraindividual Variation. Empirical support for the specific hypotheses is considered in the *Discussion* section. The first group of analyses is principally descriptive and reports on the main non-diary and diary outcomes over time, the correlations between the set of covariates and the outcomes, and the extent to which relationship dissolution is associated with a dysregulation of daily emotion via comparisons to the dating sample. In addition, based on graphs of the diary composite scores and individual Z-scores for each participant (included in Appendix D), a brief portion of the first section is dedicated to more qualitative observations of the way Love, Sadness, Anger, and Autonomy operate over time. Finally, a series of hierarchical regressions were conducted to predict non-diary outcomes at Day_28 using the covariates of attachment security, coping self-blame and avoidance, mean reports of daily affect on the four diary composites, and mean standard deviations in the four composites.

The second section focuses on elucidating the structure of daily affect through factor analysis and determining whether changes in post-dissolution emotions are quantitative or qualitative in nature. These analyses assessed factorial invariance (see McArdle & Nesselroade, 1994) by determining the best fitting factor structure for Day_1 affect and then attempting to replicate this structure using a confirmatory factor model with the Day_28 diary data. The third section of the *Results* focuses on latent curve growth modeling (LGM), a general approach for analyzing trends (both upward and downward) in data (Willett & Sayer, 1994). One potential problem in fitting LGMs with a relatively large number of diary items is that the statistical power gained from these observations causes the growth models to misfit (Curran, personal communication). In order to deal with this problem, the observed indicators were limited to weekly observations that combined data points. Thus, 14 of the 28

occasions of measurement were used; these 14 observations were combined such that the final models included 7 occasions of measurement, each of which was the average score of two contiguous days spaced four days apart (e.g., average of Day_1 & Day_2 = Occasion 1; average of Day_5 & Day_6 = Occasion 2, …. average of Day_24 & Day_25 = Occasion 7). In addition to assessing the best fitting growth models for the four diary composites over time, a series of personal-level covariates are added to examine whether individual difference variables are associated with the rates of change and initial levels for each of the composites. The role of contact with a former partner also was evaluated within the growth models by including contact as a time-varying covariate.

The fourth and final section considers intraindividual variation by searching for empirically "poolable" subgroups of participants and then conducting a series of bivariate Dynamic Factor Analyses (DFAs) using the four emotional composites. DFA is a relatively novel extension P-technique factor analysis for modeling patterns of intraindividual variability over time (Molenaar, 1985; Herberger book chapter; Wood & Brown, 1994). Creating an aggregate time series (from the pooled subgroups of participants) allows for the investigation of lead-lagged (i.e., non-contemporaneous) relations among the daily affect items. In order to study the bivariate emotional dynamics of intraindividual variation in the present study, six DFAs were conducted representing the pairing of each of the four main diary composites (i.e., Love and Sadness, Love and Anger, Love and Autonomy, Sadness and Anger, Sadness and Autonomy, Anger and Autonomy). Appendix B provides a detailed account of how these and other analyses were conducted, as well as explanations for interpreting the findings.

Results

Part I

Descriptive Analyses and Mental Health Outcomes

To simplify the presentation of the findings, descriptive tables (i.e., those reporting means, non-essential correlations and model comparisons) are presented in Appendix C, which is referred to throughout the *Results* section.

Table 2 displays the means, standard deviations, and correlations of the four main non-diary outcome variables at entry into the study (Day_1) and the final occasion of measurement (Day_28). Each of the variables was significantly associated with itself across time, and the negative outcome variables were all highly positively correlated. With one exception, reports of Positive Affect were significantly negatively associated with each of the other outcomes within and across time. Paired *t*-tests revealed significant mean declines for each of the negative outcomes over time: ART, $t\,(56) = 6.39$, $p < .001$, GD, $t\,(56) = 4.59$, $p < .001$, and IES-Intrusion, $t\,(57) = 5.71$, $p < .01$. Positive Affect increased over time, $t\,(57) = 3.56$, $p < .01$. On whole, individuals reported less nonacceptance of relationship termination, less generalized mood disturbance, less break-up related emotional intrusion and more positive affect after a month of study participation. The mean raw and residualized change scores (and the associated standard deviations) for each of the outcomes are shown in Table 3. The residualized change score is a commonly used index of change that takes into account regression to the mean (Campbell & Kenny, 1999) and predicts Time 2 scores from Time 1 scores using the residual of the regression equation. The average rates of change once regression toward the mean is accounted for were small; however, the large standard

deviations around all of the residualized change scores points to a considerable range in change over time.

Table 2

Means, Standard Deviations, and Correlations Among the Three Outcome Variables at the First and Final Occasions of Measurement

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) ART, Day_1	1.0							
(2) ART, Day_28	.72**	1.0						
(3) GD, Day_1	.42**	.44**	1.0					
(4) GD, Day_28	.31*	.42**	.67**	1.0				
(5) IES, Day_1	.59**	.54**	.59**	.38**	1.0			
(6) IES, Day_28	.39**	.61**	.37**	.55**	.68**	1.0		
(7) PA, Day_1	-.41**	-.29*	-.64**	-.47**	-.61**	-.39**	1.0	
(8) PA, Day_2	-.26*	-.19	-.51**	-.53**	-.33**	-.37**	.66**	1.0
Means	**25.63**	**22.67**	**38.44**	**32.85**	**18.79**	**13.78**	**41.82**	**46.35**
Standard Deviations	**4.82**	**4.12**	**10.99**	**11.13**	**8.20**	**7.93**	**11.25**	**11.39**

Note. ART = Acceptance of Relationship Termination (range: 11-44); GD = Mood and Anxiety Symptom Questionnaire, General Disturbance (range: 16-57); IES = Impact of Events, Intrusion Scale (range: 1-34); PA = Mood and Anxiety Symptom Questionnaire, Positive Affect (range: 16-53). * = $p < .05$; ** = $p < .01$; *** = $p < .001$

Table 3

Mean Raw and Residualized Change Scores for Main Non-Diary Outcome Variables

	Raw ART Change	Resid. ART Change	Raw GD Change	Resid. GD Change	Raw IES Change	Resid. IES Change	Raw PA Change	Resid. PA Change
Mean	-2.79	.10	-5.49	.019	-5.08	.08	4.49	-.03
Standard Deviation	3.34	2.86	9.02	8.27	6.77	6.04	9.20	8.47

Note. Raw change scores are computed, Day_28 – Day_1, such that negative scores indicate declines over time. Resid. = Residualized change score. ART = Acceptance of Relationship Termination; GD = Mood and Anxiety Symptom Questionnaire, General Disturbance; IES = Impact of Events, Intrusion Scale; PA = Mood and Anxiety Symptom Questionnaire, Positive Affect.

Among the chief goals of this study is understanding how break-up related emotions change in the four to six weeks following relationship dissolution and the correlates of better and worse psychological adjustment over time.[7] Thus, in addition to the four non-diary outcomes and daily diary reports of affect, a number of covariates were assessed. The means, standard deviations, and bivariate correlations among these variables are presented in Appendix C, Table C1.

Table 4 presents the correlations among the covariates and the four non-diary outcomes. Attachment security was significantly negatively correlated with each of the outcome variables at each occasion of measurement (with the exception of ART at Day 28). Participants reporting greater attachment security reported less break-up related distress, less generalized affective disturbance, and more positive affect at each of the measurement occasions.

[7] Although the diaries were kept for only four weeks, some participants entered the study up to 2 weeks after the end of their relationship. Thus, overall, this study focuses on adjustment in the first four to six weeks following the end of a relationship, even though the actual study length is 28 days.

Self-reported coping also was associated with the non-diary outcomes. Individuals who blamed themselves for the break-up experience reported significantly more negative outcomes at each time point and less positive affect.[8] Participants who reported an avoidant coping style also reported significantly more non-acceptance of relationship termination at Day_28, more generalized affective disturbance at both occasions of measurement, more emotionally intrusive break-up related experiences, and less positive affect at both occasions of measurement. For the negative outcomes, these relations held across two different measures of avoidance (the Ways of Coping Avoidance Scale and the Impact of Events Active Avoidance Scale). Participants who reported blaming themselves and/or engaging in active avoidance had much difficulty negotiating the separation experience-- both at the outset of the study and when re-assessed at the Day_28 follow-up. In contrast, self-reports of problem focused coping were positively associated with positive affect at entry into the study and the final occasion of measurement. Positive affect also was negatively associated with self-reported neuroticism and positively associated with conscientiousness.

Contrary to expectations, length of relationship was uncorrelated with the main outcome variables. A review of the scatter plots for each of the six outcomes by relationship length indicated that the small associations were owed to two off-setting patterns. A large proportion of individuals in short-term relationships experienced considerable distress at relationship termination; in addition, nine individuals dating two-years or longer reported very little dissolution-related distress. Separation initiation was significantly positively correlated with nonacceptance of relationship termination and generalized disturbance at

[8] One obvious question is whether individuals who engaged in self-blame also initiated the break-up. As shown in the Appendix C, Table C1, self-blame and initiator status were unrelated.

entry into the study, indicating that participants who reported that their partners initiated the break-up also reported more nonacceptance and generalized distress at Day_1.

Diary Outcomes. Means, standard deviations, and paired *t* - tests for each diary item at Day_1 and Day_28 are reported in Appendix C, Table C2. In general, participants demonstrated mean declines on the diary items over time, reporting significantly less feelings of Love as well as negative affect.

In order to evaluate the extent to which daily emotions are disturbed from their normative baseline following a break-up, mean comparisons were made between the dissolution and dating samples. Table 5 presents these comparisons.[9] As shown, significant mean differences existed for many of the diary items. Dating sample participants reported significantly more feelings of love and closeness toward their partner, although no significant differences were found for the "Confided By" item. The dissolution participants reported significantly more mean negative affect on 14 of the 19 diary items. Participants did not differ in their mean reports of feeling Peeved, Grouchy, Helpless, Furious, and Worthless (toward one's former partner).[10]

Another way of comparing the emotional experiences of individuals in these groups is to consider the mean standard deviations for each person. On average, how much variability do individuals report around the item means? Mean standard deviations (and their associated standard deviations) for the diary items are presented in Table 6 by sample. Similar to

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[9] The Autonomy variables (i.e., Relieved, Free, Courageous, Strong) were inadvertently omitted from the dating sample diary. Therefore, comparisons are limited to mean reports of negative affect and feelings of Love.

[10] For the dissolution sample, these means were re-computed for the first week of study participation (i.e., Days 1-7) and the group comparisons were re-run. All significant and non-significant differences held for the comparison of the Love items. Under this comparison, with the exception of reports of feeling Grouchy, participants in the dissolution group reported significantly more negative affect for each diary item.

findings for the mean scores, there were significant differences between the dissolution and the dating samples. For every significant difference, participants in the dissolution sample reported larger average standard deviations than participants in the dating sample. Group differences in variability were owed largely to mean item differences. Across both groups, all mean negative affect scores were significantly positively correlated with their mean standard deviations, indicating that participants reporting high levels of negative affect toward their dating partner or ex-partner also demonstrated more variability in their response patterns. The opposite pattern was observed for the Love variables; item means and mean standard deviations were negatively correlated, indicating that individuals who reported less feelings of love toward their partner or ex-partner also demonstrated more variability in their response patterns. Recall that participants in the dissolution sample reported significantly less feelings of Love than individuals in the dating sample (see Table 5).

Table 4

Bivariate Correlations Between Non-Diary Outcomes and Covariates

	ART, Day_1	ART, Day_28	GD, Day_1	GD, Day_28	IES Intrusion, Day_1	IES Intrusion, Day_28	PA, Day_1	PA, Day_28
(1) RSQ, Secure	-.42**	-.22	-.55**	-.38**	-.32*	-.26*	.48**	.41**
(2) RSQ, Fearful	.25	-.01	.37**	.14	.19	.03	-.14	-.06
(3) RSQ, Preoccupied	.19	.17	.21	.15	.14	.08	-.26*	-.15
(4) RSQ, Dismissing	-.08	-.01	.01	.03	.04	-.02	.18	.13
(5) RWCCL, Problem Focused	-.10	.06	-.08	-.09	-.03	-.09	.35**	.35**
(6) RWCCL, Support Seeking	.13	.03	.10	.02	.09	-.02	-.18	-.04
(7) RWCCL, Blames Self	.49**	.48**	.46**	.36**	.41**	.42**	-.54**	-.54**
(8) RWCCL, Avoidance	.24	.28*	.51**	.48**	.38**	.32*	-.29*	-.37**
(9) NEO, Neuroticism	.23	.11	.43**	.39**	.17	.10	-.46**	-.54**
(10) NEO, Extraversion	.25	.31	.20	.38**	.05	.21	.04	.02
(11) NEO, Openness	-.01	-.22	-.15	-.23	-.17	-.37	.02	-.17
(12) NEO, Agreeableness	.39**	.28*	.23	.14	.16	.16	-.05	-.17
(13) NEO, Conscientiousness	-.19	.04	-.20	-.12	.02	.10	.27	.42**
(14) IES_T1, Avoidance	.18	.13	.15	.09	.38**	.38**	.01	.01
(15) IES_T2, Avoidance	.30**	.28*	.26	.37**	.23	.45**	-.24	-.15
(16) Length	.02	.02	.04	.22	.05	.13	-.10	-.12
(17) Initiator Status	.35*	.14	.27*	.12	.17	.08	-.16	-.12
(18) Gender	-.06	.07	.14	.12	-.05	.06	-.16	-.10

Note. ART = Acceptance of Relationship Termination; GD = Mood and Anxiety Symptom Questionnaire, General Disturbance; IES = Impact of Events, Intrusion Scale; PA = Mood and Anxiety Symptom Questionnaire, Positive Affect; RSQ = Relationship Styles Questionnaire; RWCCL = Revised Ways of Coping Checklist; NEO = NEO-FFI Personality Inventory. Initiator status ranges from 1 – 7 with higher values indicating the participant felt left by their former partner. * = $p < .05$; ** = $p < .01$

Table 5

Means Comparisons of Diary Items Between Dissolution and Dating Samples

Emotion	Dissolution Sample		Dating Sample		*F*
	M	*SD*	*M*	*SD*	
Miserable without him/her	3.51	2.04	8.47	.90	159.51***
I can confide in him/her	4.66	2.26	7.76	1.22	48.70***
Enjoy being confided by him/her	5.84	2.38	5.99	2.03	.09
Lonely seek him/her out	4.18	2.14	7.60	1.63	58.36***
Forgive him/her for practically anything	4.42	2.30	7.11	1.77	31.00***
Primary concern is his/her welfare	4.77	2.01	6.22	2.11	9.88***
Do almost anything for him/her	4.87	2.36	6.05	1.78	5.74***
Responsible for his/her well-being	3.78	1.83	8.41	.953	167.11***
Hard without him/her	3.72	2.02	6.52	1.84	40.29***
Angry	1.44	.54	1.32	.41	4.65*
Unhappy	1.76	.73	1.19	.43	9.36**
Sorry for things done	1.75	.84	1.30	.43	7.48**
Peeved	1.44	.60	1.29	.44	2.56
Sad	1.78	.66	1.25	.30	12.64***
Grouchy	1.23	.31	1.20	.24	.15
Blue	1.57	.58	1.26	.38	6.65*
Hopeless	1.30	.51	1.06	.15	6.38*
Unworthy	1.28	.47	1.05	.13	5.99*
Spiteful	1.24	.46	1.05	.14	4.77*
Annoyed	1.26	.44	1.27	.30	5.97*
Discouraged	1.65	.61	1.28	.37	10.04*
Resentful	1.60	.73	1.13	.21	4.79*
Lonely	1.37	.55	1.55	.63	5.29*
Helpless	1.86	.79	1.06	.11	3.46
Furious	1.15	.31	1.04	.12	3.26
Deceived	1.34	.56	1.04	.11	8.25***
Worthless	1.17	.37	1.03	.11	3.58
Guilty	1.55	.73	1.13	.23	9.03***

Note. The Love items (from "Miserable without" to "Hard without") range from 1-9, with 1 being "Strongly Disagree" and 9 being "Strongly Agree." The remainder of items ranged from 1-5, with 1 being "Not At All" and 5 being "Extremely."
* = $p < .05$; ** = $p < .01$; *** = $p < .001$.

Table 6

Means Comparisons of Variability in Diary Items Between Dissolution and Dating Samples

Emotion	Dissolution Sample		Dating Sample		*F*
	M	*SD*	*M*	*SD*	
Miserable without him/her	.94	.56	.37	.37	22.05***
I can confide in him/her	1.07	.57	.55	.42	19.28***
Enjoy being confided by him/her	1.06	.66	.82	.58	2.64
Lonely seek him/her out	1.10	.54	.50	.45	26.49***
Forgive him/her for practically anything	.90	.54	.67	.57	3.21
Primary concern is his/her welfare	1.10	.46	.63	.50	19.43***
Do almost anything for him/her	.96	.47	.82	.46	1.51
Responsible for his/her well-being	.97	.47	.50	.72	13.52***
Hard without him/her	.88	.52	.95	.70	.263
Angry	.51	.37	.24	.39	9.71***
Unhappy	.63	.34	.39	.39	9.41***
Sorry for things done	.57	.36	.38	.48	7.30**
Peeved	.57	.40	.34	.40	4.94*
Sad	.65	.29	.37	.35	10.82**
Grouchy	.42	.34	.32	.30	1.85
Blue	.54	.34	.35	.42	4.82*
Hopeless	.32	.38	.11	.26	7.77**
Unworthy	.37	.42	.10	.22	9.73**
Spiteful	.30	.39	.09	.19	6.95*
Annoyed	.34	.37	.42	.33	12.08**
Discouraged	.67	.37	.35	.39	9.32**
Resentful	.48	.33	.20	.29	2.91
Lonely	.42	.40	.46	.50	6.75*
Helpless	.66	.38	.11	.20	4.12*
Furious	.28	.37	.09	.26	6.18*
Deceived	.33	.43	.06	.21	9.94*
Worthless	.24	.37	.05	.17	6.94*
Guilty	.47	.44	.20	.33	8.72**

Note. The Love items (first nine items, from "Miserable without" to "Hard without") range from 1-9, with 1 being "Strongly Disagree" and 9 being "Strongly Agree." The remainder of items ranged from 1-5, with 1 being "Not At All" and 5 being "Extremely." * = $p < .05$; ** = $p < .01$; *** = $p < .001$.

Emotional composite scores. Weekly means and standard deviations for each of the four main diary scales are reported in Appendix C, Table C3. As noted in the *Method* section, all composite scores were re-scaled to a 100-point basis with scores representing a percentage of the total possible score for each measure. Based on this re-scaling, at entry into the study, participants reported significantly more Love than Sadness ($t = 5.24$, $p < .01$) and Anger ($t = 7.01$, $p < .01$), more Sadness than Anger ($t = 4.71$, $p < .01$), and more Autonomy than Anger ($t = 3.21$, $p < .01$).

Figure 2 displays line the graph mean responses for each emotion over time. The Y-axis was re-scaled for the small plots to better illustrate the pattern of change. A general review of the trajectories indicates that Love and Sadness are steadily declining, Anger declines then rises again, and Autonomy appears to follow a quadratic function by decreasing and then increasing. Only statistical analyses can determine if variability in the trends over time represent true growth/decline or measurement error, and this topic is considered in the third section of the *Results*.

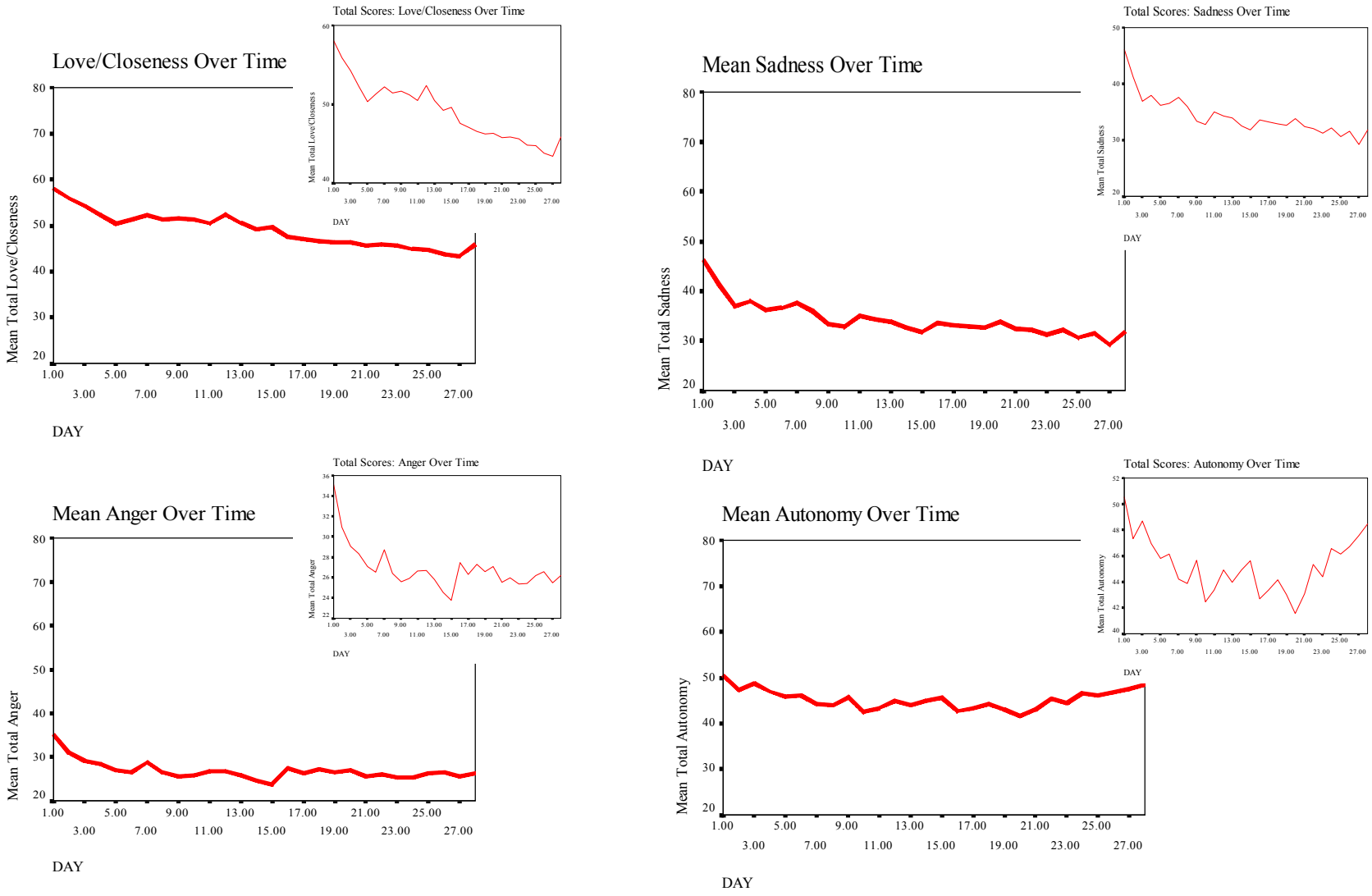

Figure 2. Emotional composite trajectories over time.

One potential problem when considering mean trajectories is that summary scores can mask individual variation in two important ways. First, group means can obfuscate individual patterns by creating summary scores of no substantive meaning. True patterns of decrease and increase can offset each other to create a no-growth summary score when considerable change does in fact exist. Second, mean scores mask *ipsative* change (Lamiell, 1981; Roberts, Caspi, & Moffitt, 2001), which refers to the patterning of an individual's scores with respect to their own mean. For ispsative change, the amount of change in the total score is not as important as deviation's from an individual's own mean and the consistency of their profile over time. In order to begin examining individual change in greater detail, two plots were generated for each individual over time: (a) Total scores on each of the four composites; and (b) Z-scores of individuals' deviations from *their own* mean on each of the four composites. These plots are displayed together for each person in Appendix D.

Several patterns observed in the graphs are noteworthy. First, at broadest level, individuals demonstrate large differences in intraindividual variation, both in terms of degree of absolute variability and the emotional reactions that predominate over the 28-day diary period. Moreover, considerable differences exist within persons. Some participants, for instance, report considerable Sadness and Sadness variability but very little Love; others report little Sadness or Love and considerable Autonomy. Pulled from Appendix D, the plots in Figure 3 illustrate four examples of the way individuals might be grouped based these patterns of within person variation (i.e., interindividual differences in intraindividual variation). In plot A, the clearest pattern is cycling, with this person reporting -considerable

fluctuations in daily affect. The person in plot B could be said to be "stuck" on Love, demonstrating consistently high levels of Love for their former partner but few other emotions. In plot C, Autonomy rises over time while the other emotions decrease and then level-off. In contrast, the person in plot D evidences high Autonomy from the first day of measurement. Overall, the plots in Figure 3 can be considered exemplars of the wide-range of emotional experiences individuals report following a break-up.

Second, individuals reporting ostensibly similar scores on the non-diary outcomes displayed vastly different patterns of daily emotional experience. For example, the three individuals reporting the highest scores on the ART at Day_28 (participants 28, 16, 20, respectively) reported substantially different patterns of daily affect, especially with respect to Sadness and Anger. Participant 16 reported a pattern of Love similar to that of Participant 20, but differed from both other participants with respect to their expression of Anger. This qualitative observation underscores the notion that despite potential utility of the individual difference variables in predicting daily emotional experience, within person variability is at least as large as the between person variability in this sample.

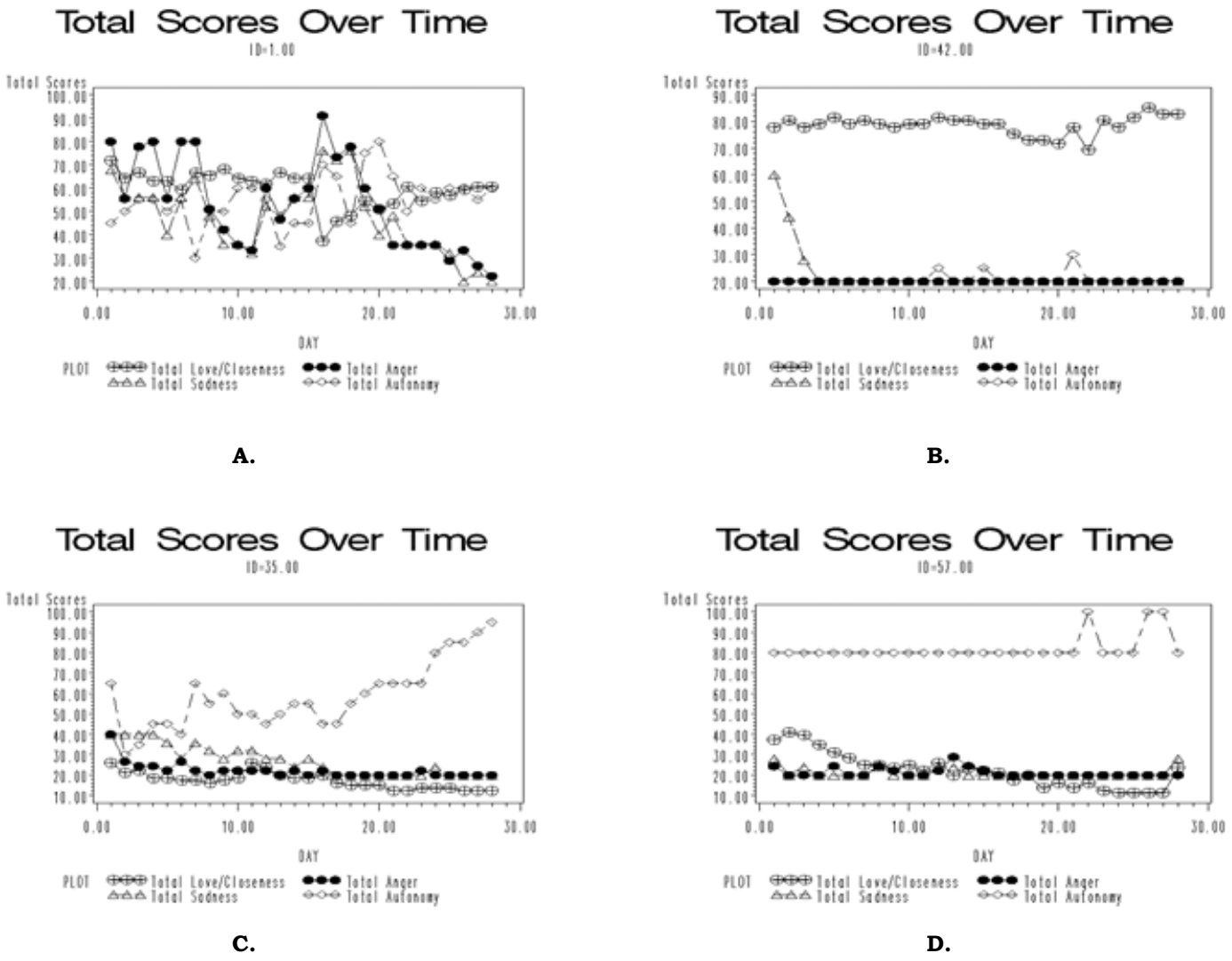

Figure 3. Four illustrative plots highlighting differences in patterns of intraindividual variation over time.

Finally, the individual plots illustrate that almost every participant in the sample exhibits a clear covariation in their reports of daily emotions. For example, consider participant 24 (Appendix D). Around Day_15, her reports of Autonomy begin a sharp increase while her Love scores begin to decline (at what appears to be a slower rate than increase in Autonomy). This patterning of covariation, where variables increase or decrease together or when they move in opposite directions suggests that common factors may underlie the experience of different emotional composites and/or that emotions may lead or lag one another (e.g., decreases in Sadness may lead increases in Autonomy). These possibilities are examined in more detail empirically in the second and fourth section of the *Results*.

Intraindividual means and standard deviations: Relations with non-diary outcomes. As shown in Table 7, the four non-diary outcome variables were associated with the mean intraindividual diary composite scores and standard deviations. Participants reporting more average Love also reported significantly more nonacceptance of relationship termination and break-up related emotional intrusion at entry into the study and the final occasion of measurement. Positive affect was not significantly associated with mean reports of Love. Higher mean scores of Sadness were associated with higher scores on the three negative outcome variables at each occasion of measurement, and positively associated with positive affect. Anger was positively associated with generalized disturbance and intrusive experiences at Day_28, and negatively correlated with Positive Affect at both occasions. With the exception of nonacceptance at Day_28, Autonomy was significantly negatively correlated with each of the negative outcome variables and positively associated with positive affect.

Regarding intraindividual standard deviations, the average variability reported by each person over time on Love was not associated with any of the outcome variables at either occasion of measurement, indicating that the extent to which individuals reported variability in feelings of love for their former partner was unrelated their reports of post-dissolution adjustment. In contrast, reports of greater variability in daily Sadness were significantly positively associated with the three negative outcome variables and negatively associated with Positive Affect at each occasion of measurement. Participants who reported struggling with the break-up experience also expressed considerable variability in their daily reports of Sadness. For Anger, greater average variability also was associated with higher general disturbance and break-up related emotional intrusion at Day_28 (but not Day_1), and negatively associated with positive affect at Day_1. Finally, participants' variability in Autonomy was significantly negatively associated with nonacceptance at Day_1 and less break-up related emotional intrusion at both occasions of measurement. This pattern is owed primarily to the fact that participants who reported elevated and maintained distress also reported stable and low levels of Autonomy.

Table 7

Bivariate Correlations Among Non-Diary Outcomes and Mean Diary Composites and Standard Deviations

	Mean Love	SD Love	Mean Sadness	SD Sadness	Mean Anger	SD Anger	Mean Autonomy	SD Autonomy
ART_D1	.28*	.11	.39***	.35**	.15	.22	-.32*	-.33*
ART_D28	.38**	.00	.38***	.38**	.19	.20	-.24	-.21
GD_D1	.24	.04	.45***	.45**	.23	.22	-.40**	-.14
GD_D28	.15	.10	.55**	.62***	.36**	.41**	-.30*	.09
IES_D1	.47***	-.06	.52***	.46**	.18	.07	-.46***	-.31*
IES_D28	.386**	-.13	.64***	.46**	.37**	.27*	-.39**	-.27*
PA_D1	-.23	.05	-.60***	-.49***	-.38***	-.28**	.43***	.20
PA_D2	-.19	.12	-.43***	-.30***	-.27*	-.23	.48***	.06

Note. ART = Acceptance of Relationship Termination; GD = Mood and Anxiety Symptom Questionnaire, General Disturbance; IES = Impact of Events, Intrusion Scale; PA = Mood and Anxiety Symptom Questionnaire, Positive Affect.
* = $p < .05$; ** = $p < .01$; *** = $p < .001$.

Mean scores on the daily composite variables and intraindividual standard deviations also were associated with several of the covariates (Table 8). Attachment security was significantly negatively associated with mean Sadness and Sadness variability while also significantly positively correlated with Autonomy and Autonomy variability. Self-blame and avoidant coping (as reported on the RWCCL and the IES scale at Day_28) also were positively associated with Sadness and Sadness variability, indicating that individuals who reported engaging in these coping styles reported greater mean Sadness and greater mean Sadness variability. The IES_Avoidance Scale at Day_28 also was positively associated with mean Anger.

Table 8

Bivariate Correlations Among Covariates and Mean Diary Composites and Standard Deviations

	Mean Love	SD Love	Mean Sadness	SD Sadness	Mean Anger	SD Anger	Mean Autonomy	SD Autonomy
(1) RSQ, Secure	.02	-.12	-.34**	-.33**	-.19	-.26*	.37**	.27*
(2) RSQ, Fearful	-.02	.31	.15	.16	.19	.14	-.36*	-.21
(3) RSQ, Preoccupied	-.08	.03	.22	.16	.08	.06	-.04	-.02
(4) RSQ, Dismissing	.20	.09	-.12	.03	.03	.018	-.06	.12
(5) RWCCL, Problem Focused	.07	.16	-.17	-.02	-.08	-.03	.14	.13
(6) RWCCL, Support Seeking	.08	.06	.20	.16	.11	.11	-.06	.04
(7) RWCCL, Blames Self	.29*	.02	.41**	.27*	.18	.14	-.37**	-.21
(8) RWCCL, Avoidance	.05	.16	.30**	.34**	.10	.08	-.27*	-.13
(9) NEO, Neuroticism	.01	.17	.23	.35**	.06	.13	-.45**	.22
(10) NEO, Extraversion	-.01	.19	.08	.27*	.01	.09	.17	.24
(11) NEO, Openness	-.06	-.11	-.27*	-.03	-.26*	-.21	.18	-.01
(12) NEO, Agreeableness	-.08	.13	.06	.09	.07	.191	-.16	.27*
(13) NEO, Conscientiousness	.16	-.13	-.22	-.18	-.08	-.13	.27*	.08
(14) IES_T1, Avoidance	.04	.13	.13	.14	-.031	-.04	.03	-.19
(15) IES_T2, Avoidance	-.10	.07	.50***	.34**	.38**	.33*	.01	-.11
(17) Length	-.06	-.04	.06	-.03	-.09	-.01	.24	-.06
(17) Initiator Status	-.05	-.06	.21	.10	.13	.04	-.03	-.26*

Table 8 (cont)

	Mean Love	SD Love	Mean Sadness	SD Sadness	Mean Anger	SD Anger	Mean Autonomy	SD Autonomy
(18) Gender	-.06	-.02	.21	.23	.20	.24	.02	.03

Note. RSQ = Relationship Styles Questionnaire; RWCCL = Revised Ways of Coping Checklist; NEO = NEO-FFI Personality Inventory. Initiator status ranges from 1 – 7 with higher values indicating the participant felt left by their former partner.
* = $p < .05$; ** = $p < .01$; *** = $p < .001$.

Predicting mental health outcomes. The regressions reported on in this section were conducted to determine whether intraindividual means and mean variability (from the diary composites) explained additional variance in the four non-diary outcomes at Day_28 after controlling for attachment security, coping self-blame, and coping avoidance (each of which was highly related to the four outcome variables at entry into the study and the Day_28 follow-up). For these analyses, the independent variables were entered in hierarchical regressions in three blocks: (a) Attachment security, coping self-blame, and coping avoidance; (b) Intraindividual means of Love, Sadness, Anger, and Autonomy; and (c) Intraindividual variability for each of the measures in the previous block. One problem in conducting these analyses is limited power to detect statistical effects once all covariates are entered in the model. The full models required using 11 degrees of freedom. In order to reduce the number of degrees of freedom (and thereby increase power) the full models were run, non-significant items were removed (except in the case of mean scores when variability was significant), and the models were re-run with fewer parameters. Overall, this approach seeks to identify the specific items associated with each outcome out of the set of 11 covariates (i.e., attachment security, coping self-blame, coping avoidance, means of Love,

Sadness, Anger, Autonomy, and mean variability in Love, Sadness, Anger, Autonomy).[11] Table 9 displays the results of these regressions.

For nonacceptance, two items explained 27% of the adjusted variance in the Day_28 outcome. Individuals reporting more self-blame and greater mean Love reported more nonacceptance of relationship termination after a month of study participation. Within a multiple regression framework, attachment security was not associated with ART scores, nor were mean levels of Sadness, Anger, or Autonomy. Moreover, daily emotional variability was unrelated to participants' ART scores at Day_28. For generalized disturbance, three items explained 46% of the adjusted variance in the Day_28 outcome. Individuals who reported adopting an avoidant coping style, who reported greater mean Sadness, and greater mean variability in Sadness also reported more GD after a month of study participation. For the IES, two items explained 47% of the adjusted variance in the Day_28 outcome. Notably, mean Sadness explained an additional 32% of the variance in emotional intrusion scores beyond that explained by self-blame. Individuals reporting greater self-blame and greater mean Sadness reported significantly more break-up related emotional intrusion after a month of study participation. For PA, 6 items explained 42% of the adjusted variance. The second block of variables, which included mean diary reports of Sadness and Autonomy, did not explain significant variance above the first block of two covariates (however, it was retained in the model to control for mean scores when considering variability). Individuals reporting greater attachment security, less self-blame, more average variability in Love, and less average variability in Autonomy reported greater PA after a month of study participation.

[11] Given the high correlations for each of the outcome variables over time, controlling for Day_1 scores (i.e., entering the Day_1 variable in the first step of the model) makes little practical sense. Little variance remains once Day_1 scores are used to predict Day_28 scores.

Table 9

Summary Statistics for Best Fitting Hierarchical Regressions Predicting Outcomes at Day_28

Model	β	Adjusted R^2	Overall *F*	ΔR^2	*F* for ΔR^2
ART					
Block 1: Self-Blame	.40**	.22	16.59***		
Block 2: Mean Love	.26*	.27	11.24***	.06	4.59*
GD					
Block 1: Avoidance	.48***	.22	16.69***		
Block 2: Mean Sadness	.43**.	.39	18.90***	.17	16.40**
Block 3: Sadness Variability	.39***	.46	16.78***	.07	7.98**
IES					
Block 1: Self-Blame	.41***	.15	11.23***		
Block 2: Mean Sadness	.54***	.47	21.47***	.32	26.35***
PA					
Block 1:		.33	14.64**		
Attachment Security	.26*				
Self-Blame	-.44**				
Block 2:		.37	9.26***	.04	2.86
Mean Love	.07				
Mean Autonomy	.35**				
Block 3:		.42	7.46***	.05	3.20*
Love Variability	.24*				
Autonomy Variability	-.22*				

Note: ART = Acceptance of Relationship Termination; GD = Mood and Anxiety Symptom Questionnaire, General Disturbance; IES = Impact of Events, Intrusion Scale; PA = Mood and Anxiety Symptom Questionnaire, Positive Affect.
* = $p < .05$; ** = $p < .01$; *** = $p < .001$.

Part II

Affective Structure Over Time

A series of factor analyses were conducted to assess the structure of post-relationship affect and to determine whether this structure remains invariant over time. Given the large number of variables and relatively small sample size for static R-technique factor analysis, the number of items was reduced according to a twofold strategy. First, because factor analysis relies of covariance analysis, items with limited variability over time were removed and not considered further in this section. Second, a principal components analysis was conducted on the Love scale and the four highest loading items were retained for factor analysis. Overall, 17 of 33 diary items were retained. The means and standard deviations of these are reported in Appendix C, Table C4**.**[12]

The following strategy was adopted to pursue questions of structure and invariance: (a) Exploratory factor analysis (EFA) was conducted on the Day_1 diary items to determine the best fitting model at entry into the study; (b) A series of nested confirmatory factor analyses (CFA) were conducted on the Day_28 items using the structure identified from the EFA analyses. Metrically and configurally invariant models were compared to determine if the affective structure remained invariant over time; and (c) EFA was conducted on the same items at Day_28 to determine if varying the factor structure provided a better fit to the observed covariance matrix. The best-fitting model for the last diary occasion was then specified and fit in a CFA framework.

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[12] In some respects, selecting items this way produces an artificial outcome because all diary items are not retained; however, given the exploratory nature of the present study and the large number of indicators for a relatively small sample, this approach is reasonable.

Exploratory factor analysis (Day_1). A series of static EFAs were conducted to determine the best fitting and most parsimonious affective structure for Day_1 diary variables. The analyses indicated that both three- and four-factor models fit the data well. However, given that the fourth factor was defined by only two items and explained little additional variance above the three primary factors, the three-factor model was retained. The Promax-rotated factor structure is displayed in Table 10. The first factor, named Mixed Love and Sadness ("Mixed," for short), accounted for 30% of the overall variance in the items and was characterized by high loadings on the four Love items as well as high loadings on the Sadness items. At entry into the study, individuals reported a common pattern of variability in their diary lo love and sadness, and these items tapped a single domain of measurement. The second factor, Anger, was characterized by high loadings on items specific to this construct (i.e., angry, peeved, bad-tempered, and annoyed), as well as the item "Unhappy," which operated in a relatively complex manner as indicated by high cross-loadings on each of the first two factors. Anger was positively correlated with the first factor (r = .29), indicating that individuals reporting high scores on the Mixed factor also tended to report higher scores on the Anger factor. The final factor, Autonomy, was characterized by a high negative loading on the "discouraged" variable as well as high positive loadings on the four items intended to capture positive affect (i.e., Relieved, Free, Courageous, and Strong). This factor was strongly negatively correlated with the first factor (r = -.49) but unrelated to the second factor (r = -.02), indicating that higher scores on Autonomy were associated with lower reports on the Mixed factor (and vice versa), but unrelated to reports of Anger.

Table 10

Oblique Factor Loadings for Diary Items at Day_1

Item	Mixed Love and Sadness	Anger	Autonomy
Miserable without them	.601	--	--
Enjoy being confided in by them	.446	--	--
Lonely, first thought is to seek them out	.505	--	--
Hard to get along without them	.631	--	--
Sad	.825	--	--
Unhappy	.431	.552	--
Blue	.899	--	--
Discouraged	--	--	-.355
Lonely	.592	--	--
Angry	--	.850	--
Peeved	--	.881	--
Bad-Tempered	--	.393	--
Annoyed	--	.845	--
Relieved	--	--	.911
Free	--	--	.898
Courageous	--	--	.551
Strong	--	--	.563
Variance Explained	30%	18%	8%

Note. Loadings are standardized and those below .35 were omitted for ease in interpretation.

Confirmatory factor analysis (Day_28). Table 11 displays the fit indices for the series of nested factor models. The first confirmatory step was to test a full metrically invariant model at Day_28 using the data structure and loadings identified at Day_1. In Model 1, the factor structure, loadings, and residual variances were all fixed to be exactly the same as the estimates from Day_1. Item intercepts were freed, allowing for quantitative changes over time. This model provided no evidenced of fit to the data at Day_28 (as shown in the first column of Table 11) but is a useful baseline for comparison. Model 2 loosened some of the constraints of the metrically invariant model by allowing the residuals, factor variances, and factor correlations to be freely estimated. This led to a strong improvement in

fit relative to the baseline model. However, as evidenced by the CFI and RMSEA, Model 2 still fit the data poorly. Model 3 loosened all the constraints of metric invariance by setting a configurally invariant model, stipulating that only the pattern of salient vs. non-salient items remained the same. In other words, Model 3 retained the general factor structure over time but did not require the items to load in precisely the same way. Again, this model led to a significant improvement over the free residual specification ($\Delta\chi 2 = 81$, for $\Delta df = 15$, $p < .05$), but was still a poor fit to the data. The loading pattern of Model 3 provided a number of clues of potential change in factor structure over time. For example, the Love and Sadness items loading highly on the Mixed factor no longer loaded in the same direction, suggesting that these items might comprise separate factors at Day_28.

Table 11

Model Fit Statistics for Alternative Confirmatory Models at Day_28

Fit Indices	Model 1: Full Metric Invariance	Model 2: Free Residuals, Metric Loadings	Model 3: Configural Invariance	Model 4: CFA of EFA at Day_28
$\chi 2$	3282.27	368.29	287.11	178.22
df	152	129	114	111
Parms	18	41	56	59
CFI	.02	.36	.53	.91
RMSEA (90% CI)	.83 (.81, .89)	.25 (.22, .29)	.22 (.19, .26)	.10 (.07, .13)

Note. df = degrees of freedom; Parms = parameters estimated in model; CFI = Comparative Fit Index; RMSEA = root mean squared error of approximation.

Exploratory analyses (Day_28). Given the weak fit of the configurally invariant specification (Model 3, Table 11), a series of EFAs were conducted to determine the best

fitting structure at Day_28. The best alternative model was then specified and fit within a CFA framework. As with the Day_1 diary data, both three- and four-factor models fit well at Day_28. On the final occasion, however, all four factors were robust and accounted for considerable overall variance in the items. The four factor structure indicated that the Mixed factor "separated" over time such that the emotions of Love and Sadness now constituted independent factors. The fit statistics for this model are also shown in Table 11 (under Model 4) and indicate that the four factor structure fits the data well at Day_28. It is important to note that this model is not nested under the baseline model and thus the evaluation of change in chi-square for degrees of freedom (between models) is not appropriate. Nonetheless, the RMSEA and CFI indicate that four factor model fits the data moderately well.

As shown in Table 12, the first factor, Love, accounted for 38% of the total item variance, the second factor, Anger, accounted for 24% and the final two factors, Sadness and Autonomy, each accounted for 9% of the item variance at Day_28. The Love factor was unrelated to the Anger factor (r = -.03), moderately positively associated with Sadness (r = .23), and strongly negatively associated with Autonomy (r = -.55). Sadness and Anger were strongly positively correlated (r = .48), while Autonomy was strongly negatively associated with Sadness (r = -.44), but only weakly negatively associated with Anger (r = -.18).

Table 12

Oblique Factor Loading Patterns for Diary Items at Day_28

Item	Love	Anger	Sadness	Autonomy
Miserable without them	.78	--	--	-
Enjoy being confided in by them	.78	--	--	
Lonely, first thought is to seek them out	.93	--	--	--
Hard to get along without them	.87	--	--	--
Sad	--	--	.86	--
Unhappy	--	--	.84	--
Blue	--	--	.73	--
Discouraged	--	--	.81	--
Lonely	--	--	.74	--
Angry	--	.88	--	--
Peeved	--	.74	--	--
Bad-Tempered	--	.90	--	--
Annoyed	--	.81	--	--
Relieved	--	--	-	.68
Free	--	--	--	.77
Courageous	--	--	--	.97
Strong	--	--	--	.93
Variance Explained	38%	24%	9%	9%

Note Loadings are standardized. The first item on each factor was fixed to 1 to set the metric for the factor. The CFA for this model also allowed the residual variances of two pairs of variables to correlate; specifically, the "miserable without them" and "hard to get along" items on the Love factor, and the "Relieved" and "Free" items on the Autonomy factor.

Part III

Analysis of Change: Growth Modeling

In order to study the change processes embodied in Love, Anger, Sadness, and Autonomy, latent growth curve models were fit to each of the four emotion composites according to the following progression: (a) A series of univariate curves were fit to each emotion beginning with an unconditional means model specifying no change over time. Additional curve shapes and change models were tested until the best fitting and most parsimonious model was identified. Within the best fitting model, nested models were compared to determine whether fixing/freeing parameters provided a better fit to the observed covariance matrix[13]. The tables comparing fit statistics are presented in Appendix C; (b) Once the univariate models were established for each emotion, a series of level-two covariates were added to determine whether individual differences explained additional variability in the level and slope of the univariate model; and (c) Finally, the diary item assessing daily contact with a former partner was added to the univariate models as a time-varying covariate.

Love. Appendix C, Table C5 displays the fit statistics for several alternative growth models for Love. For each emotion, no growth and latent linear growth models were tested first to determine if an underlying trajectory of change characterizes the observed means. The best fitting model specified an underlying pattern of linear growth in which the item uniquenesses were allowed to correlate over time. As indicated by the CFI (> .95) and RMSEA (CI90 = .07, .11) this model fit that data moderately well. The parameter estimates

[13] Recall that these growth models are based on 7 occasions of measurement, each of which represents the average score of two contiguous days. See comments in the *Data Analysis* subsection.

for this model are presented in Table 13 and indicate a significant mean level and change over time. The slope estimate was significant, indicating that participants' reports of Love declined an average of almost two percentage points every four days in the month period of the study. Moreover, there was significant variability around the mean and slope, indicating that participants varied on their starting points and rates of change. Finally, this model fixed the level/slope correlation to zero, indicating that there was no evidence of a relation between individuals' starting point and their rate of decline over time.

Table 13

Parameter Estimates for Best Fitting Latent Curve Model: Love

Parameter	Estimate	Ratio of Estimate/ Standard Error
Level ($\mu\alpha$)	54.21	23.85
Slope ($\mu\beta$)	-1.96	-5.98
Level Variance ($\psi\alpha$)	16.50	4.90
Slope Variance ($\psi\beta$)	2.31	3.83
Level/Slope Correlation ($p\alpha\beta$)	--	n/a
Error Variance (δ)	7.45	10.2
Slope Basis	0, 1, 2, 3, 4, 5, 6	

Note. Level/Slope correlation fixed to 0.

Sadness. Appendix C, Table C6 displays the fit statistics of several alternative growth models for Sadness. As with Love, including a growth factor led to improved fit over the no growth, means model. An entirely latent basis model (specified by fixing the first two parameters of the growth factor to 0 and 1 and allowing the remainder of the parameters to be freely estimated from that data) fit the data better than a linear growth model, indicating that the significant decline over time is nonlinear and steps at each measurement occasion are

unequal. In addition, the inclusion of autoregressive parameters improved the overall fit of the model; changes over time in Sadness were a function of both an underlying growth trajectory and a simplex influence from the previous occasion of measurement. The final model allowed each autoregressive parameter to be free over time and fit the data moderately well (CFI = .95, RMSEA, CI90 = .07, .11).

The parameter estimates for the best fitting model are displayed in Table 14. Importantly, when including autoregressions in the model, the slope itself has no immediate substantive significance for extrapolating rates of change because each successive observation is a product of the slope, the factor basis at that occasion, and the previous occasion of measurement. Individuals evidenced significant mean levels and slopes, and these factors were strongly negatively correlated, indicating that the higher participants self-reported Sadness at entry into the study, the slower the rate of decline (recall, for comparison, that the level and slope factors were not correlated in the Love model). In addition, there was significant variation around the mean, indicating that individuals differed in their starting point upon entry into the study. There was not, however, significant variation in the slope factor, suggesting that the underlying rate of decline was similar for all participants. Again, it is important to note that change is not only a function of the slope and growth basis, but also scores at the previous occasion. To the extent that individuals differ at any occasion of measurement, their rates of decline will vary accordingly. The autoregressions indicate that item scores of Sadness at second through final measurement were significantly positively associated with their scores at the previous occasion. The strength of this association grows over time, with measurements closer to the end being more highly influenced by the previous occasion.

Table 14

Parameter Estimates for Best Fitting Latent Curve Model: Sadness

Parameter	Estimate	Ratio of Estimate/ Standard Error
Level ($\mu\alpha$)	43.62	21.12
Slope ($\mu\beta$)	-33.21	3.84
Level Variance ($\psi\alpha$)	12.94	3.12
Slope Variance ($\psi\beta$)	9.54	1.71
Level/Slope Correlation ($p\alpha\beta$)	-.78	-2.70
Error Variance (δ)	10.12	10.28
Slope Basis	(0, 1, 1.16, 1.39, 1.43, 1.45, 1.21)	
Autoregressions	S5 on S1: β = .64 S9 on S5: β = 0.80 S13 on S9: β = 0.99 S17 on S13: β = 1.08 S21 on S17: β = 1.19 S25 on S21: β = 1.21	

Note. Only significant autoregressions are presented.

Anger. Appendix C, Table C7 displays the fit statistics of the alternative growth models for Anger. The mean, no change model provided a poor fit to the data. This is noteworthy given that Anger declines on average by only eight points over the entire measurement period. The change is significant and best described by an underlying growth trajectory. A latent basis model fit better than linear growth, and the addition of autoregressive parameters also improved the fit. For Anger, the autoregressions extended beyond one occasion of measurement. Specifically, each occasion of measurement was regressed on the prior two occasions, and regressing occasion twenty-five on occasion one led to a significant improvement of the model.

The model parameters for the best fitting model are displayed in Table 15. Individuals evidenced significant mean levels and slopes, as well as significant variability

around their initial levels. Variability around the slope was not significant, indicating that individuals did not decline on the underlying growth trajectory differently. The level and slope were significantly negatively correlated; the great individuals' reports of Anger at entry into the study, the slower their rate of decline over time. Two aspects of the final model are substantively important. First, the basis of the growth trajectory changes directions at occasions six and seven (Days_21/22 and Days_25/26, respectively), indicating that individuals experience a decline in anger over their first five occasions of measurement followed by a slight increase at the last two occasions. The pattern of change is not quadratic or cubic. Instead, the entirely latent basis indicates that the change is unequal, nonlinear, and not represented by a consistent decline. The second point concerns the directionality of the autoregressions. Consider, for example, the first two regression coefficients contributing to the score at occasion A9 (Anger Day_9/10). The regression coefficient from A5 is positive and the coefficient from A1 is negative. There are two possible explanations for this change in direction. First, the model is ill-specified and these parameters are loading in odd ways because the conceptual model is poor. This is possible given the relatively small level of absolute change; nonetheless, no alternative model fit that data better. Second, differences in the directionality of the regression equations reflect competing patterns of change, or a push-and-pull dynamic at the item level. The positive autoregressions cause Anger to increase from one occasion to the next; at the same time, these increases are tempered by a force working in the opposite direction to cause Anger to decrease from one occasion to the next.

Table 15

Parameter Estimates for Best Fitting Latent Curve Model: Anger

Parameter	Estimate	Ratio of Estimate/ Standard Error
Level ($\mu\alpha$)	33.12	22.16
Slope ($\mu\beta$)	-6.39	-12.18
Level Variance ($\psi\alpha$)	8.91	4.54
Slope Variance ($\psi\beta$)	1.04	1.79
Level/Slope Correlation ($p\alpha\beta$)	-.69	-3.98
Error Variance (δ)	7.50	10.72
Slope Basis	(0, 1, 1.59, 4.48, 3.20, -1.50, -2.22)	
Autoregressions	A9 on A5: β = .47 A9 on A1: β = -0.32 A13 on A9: β = .52 A13 on A5: β = .32 A17 on A13: β = 1.12 A17 on A9: β = -0.65 A21 on A17: β = -0.20 A21 on A13: β = -0.55 A25 on A21: β = .47 A25 on A17: β = -1.00 A25 on A1: β = -0.51	

Note. Only significant autoregressions are presented.

Autonomy. Appendix C, Table C8 displays the fit statistics of alternative growth models for Autonomy. Consistent with the curvilinear patterning of the mean scores, the mean, no change model provided a poor fit to the data. Linear and latent basis growth models improved the fit. The best fitting model, however, captured the curvilinear component of the means over time by including a third, quadratic growth factor. The first growth factor was completely linear; the second factor had squared time loadings beginning at the fourth occasion of measurement. As indicated by the CFI (> .95) and RMSEA (CI90, .00, .14) this model fit the data well.

The parameter estimates for the best fitting model are displayed in Table 16, and indicate that individuals' initial level of autonomy was significant and demonstrated significant variability. However, both slope factors were non-significant, indicating that overall autonomy scores do not change over time. There was significant variation around the linear and quadratic slopes. The lack of significant change does not mean the growth factors are poorly specified; separate from the rate of decline, the underlying trajectories accurately characterize the pattern of growth over the seven occasions. Finally, there was a significant negative correlation between the slopes, indicating that the greater a participants' linear decline, the smaller their quadratic change (and vice versa).

Table 16

Parameter Estimates for Best Fitting Latent Curve Model: Autonomy

Parameter	Estimate	Estimate/ Standard Error
Level ($\mu\alpha$)	51.41	16.77
Slope ($\mu\beta$)	-.45	-.42
Quadratic Slope ($\mu 2\beta$)	.02	.11
Level Variance ($\psi\alpha$)	15.92	3.15
Slope Variance ($\psi\beta$)	5.47	2.34
Quadratic Slope Variance ($\psi 2\beta$)	.74	2.15
Level/Slope Correlation ($p\alpha\beta$)	-.22	-.81
Level/Quadratic Correlation	.05	.22
Linear/Quadratic Correlation	-.78	-1.98
Error Variance (δ)	8.31	7.48
Slope Basis	Linear (0-6); Quadratic (squared linear basis beginning at Occasion 4)	--

Latent growth and person-level covariates. Examining the extent to which change processes are explained by person-level variables involved re-specifying the best fitting model for each emotion by adding background variables set to load on the intercept/level and slope factors. The covariates were entered in blocks according to dimensions of measurement (e.g., attachment measures entered separately from personality scales; Day_1 outcomes entered separate from Day_28 outcomes). For each block, all of the regression loadings from the background variables to the factors were set to zero to create a baseline model. Then, each covariate was freed to assess relative model improvement based on a change in two degrees of freedom until the entire block of background variables was freely estimated. The significant loadings are reported when the entire block was freely estimated and these parameters are essentially independent variables in a series of simultaneous regressions. Each significant cell includes the loading estimate divided by the standard error of measurement (which is *t* distributed, thus any value larger +/- 1.96 considered significant) and the standardized regressions coefficient.

Table 17 indicates that several of the person-level variables loaded significantly on the Love level. Specifically, individuals who reported more break-up related emotional intrusion at entry into the study, more non-acceptance at Day_28, a more dismissing attachment style, engaging in more support seeking and self-blame, and who indicated that their partner chose to end the relationship reported higher initial levels of Love. Regarding the rate of change, individuals reporting high levels of break-up related emotional intrusion at Day_28 declined faster in their reports of Love, as did individuals who initiated the break-up.

Participants reporting more emotional intrusion at Day_1 and Day_28 reported significantly more Sadness at entry into the study. This positive association also was found

for support seeking and relationship length, indicating that individuals who reported more support-seeking coping behavior and ending longer relationships had higher initial levels of Sadness. Conversely, participants reporting a secure attachment style and engaging in problem-focused coping reported lower initial levels of Sadness. Three of the person-level variables loaded significantly on the Sadness slope. Participants reporting more break-up related emotional intrusion at Day_28 declined at a slower rate, as did individuals who reported engaging in support seeking coping behavior. Individuals who reported greater attachment security demonstrated more rapid declines in Sadness over time.

Only two of the person-level variables loaded significantly on the initial level of Anger. Individuals who reported more emotional intrusion at Day_28 had a higher initial level of Anger, while participants endorsing personality items associated with openness to psychological experience reported a lower initial level of Anger. Openness was also related to the rate of decline, with individuals reporting higher levels of openness reporting faster declines in Anger over time.

While several of the covariates loaded significantly on the Autonomy level, none were significantly associated with the linear or quadratic slopes. Participants who reported more psychological distress at entry into the study (on any of the three measures) had a significantly lower level of Autonomy. Additionally, individuals reporting elevated levels of break-up related emotional intrusion at Day_28, neuroticism, and self-blame also had a lower initial level of Autonomy. In contrast, attachment security was significantly positively associated with the Autonomy level.

Table 17

Significant Person-Level Covariates For Latent Growth Curve Models of Love, Sadness, Anger and Autonomy

	Love		**Sadness**		**Anger**		**Autonomy**		
Covariate Block	**Level**	**Slope**	**Level**	**Slope**	**Level**	**Slope**	**Level**	**Slope**	**Quadratic**
Day 1									
ART_1	--	--	--	--	--	--	-3.22, -.42	--	--
IES_1	3.47, .47	--	2.39, .55	--	--	--	-4.36, -.56	--	--
MGD_1	--	--	--	--	--	--	-2.37, -.37	--	--
Day 28									
ART_28	2.82, .42	--	--	--	--	--		--	--
IES_28	--	2.37, .46	3.54, .64	-2.48, .-59	2.61, .35	--	-2.18, -.30	--	--
MGD_28	--	--	--	--	--	--	--	--	--
Attachment									
Secure	--	--	-2.33, -.39	1.98, .31	--	--	2.12, .46	--	--
Fearful	--	--	--	--	--	---	--	--	--
Dismissing	3.02, .39	--	--	--	--	---	--	--	--
Preoccupied	--	--	--	--	--	---	--	--	--
NEO									
Extraversion	--	--	--	--	--	--	--	--	--
Neuroticism	--	--	--	--	--	--	-2.83, -.43	--	--
Openness	--	--	--	--	-2.13. -.31	2.26, .47		--	--
Agreeableness	--	--	--	--	--	--	--	--	--
Conscientiousness	--	--	--	--	--	--	--	--	--
RWCCL									
Support Seeking	2.03, .26	--	2.17, .45	-2.28, -.45	--	--	--	--	--
Problem Focused	--	--	-2.19, -.34	--	--	--	--	--	--
Avoidance	--	--	--	--	--	--	--	--	--
Blames Self	2.49, .35	--	--	--	--	--	-2.61, -.35	--	--

Table 17 (cont)

	Love		Sadness		Anger		Autonomy		
	Level	**Slope**	**Level**	**Slope**	**Level**	**Slope**	**Level**	**Slope**	**Quadratic**
Relationship Factors									
Length	--	--	3.29, .19	--	--	--	--	--	--
Initiator Status	2.66, .34	-2.19, -.33	--	--	--	--	--	--	--

Note. Each cell includes the ratio of the loading estimate divided by the standard error of measurement, followed by the standardized regression coefficient. ART = Acceptance of Relationship Termination; GD = Mood and Anxiety Symptom Questionnaire, General Disturbance; IES = Impact of Events, Intrusion Scale; PA = Mood and Anxiety Symptom Questionnaire, Positive Affect; RSQ = Relationship Styles Questionnaire; RWCCL = Revised Ways of Coping Checklist; NEO = NEO-FFI Personality Inventory. Initiator status ranges from 1 – 7 with higher values indicating the participant felt left by their former partner.

Contact as a time-varying covariate. The final analyses of growth focused on adding a time-varying covariate to each of the univariate models to determine the extent to which daily emotion and contact (with one's former partner) are associated. For each emotional composite, the seven composite scores were regressed on the corresponding contact variable (e.g., Love at the first occasion regressed on contact at that occasion and so on for each occasion). Once significant parameter estimates for contact were identified, the models were re-specified to include only these items. Table 18 includes the fit statistics for when the regressions were fixed at zero and freely estimated, as well as an indication of model improvement for this change in nested models. For Love, the fit statistics indicate that at Occasions 1, 3, and 4, the more individuals reported contact with a former partner, the higher their Love composite. This pattern held for only three of the seven occasions. Higher reports of contact with a former partner were significantly associated with Sadness over the first two occasions of measurement, but not the final five. The more individuals reported any kind of contact with their former partner in the first week of entering the study, the more they also reported feeling Sad at the corresponding occasion. None of the Contact variables were significantly associated with Anger, and only a single Contact variable was significantly associated with Autonomy. Contrary to expectations, however, the association was positive, indicating that the more contact individuals reported (at the fourth occasion) the higher Autonomy scores at that occasion as well.

Table 18

Summary Statistics for Univariate Growth Models with Contact as a Time-Varying Covariate

Emotional Composites	Significant Standardized Regression Loadings	Model Fit with Loadings Fixed at 0	Model Fit with Loadings Freely Estimated	$\Delta\chi^2$ for Δdf
Love	Love1 on Contact1 =.10 Love3 on Contact3 = .08 Love4 on Contact4 = .07	χ^2 = 72.85 df = 46 RMSEA: .13 (.09, .18)	χ^2 = 64.58 df = 43 RMSEA: .09 (.04, .14)	8.27 for 2*
Sadness	Sad1 on Contact1 =.21 Sad2 on Contact2 =.21	χ^2 = 67.14 df = 32 RMSEA: .13 (.09, .18)	χ^2 = 50.72 df = 30 RMSEA: .10 (.05, .15)	16.42 for 2***
Anger	No significant loadings	χ^2 = 93.85 df = 66 RMSEA: .09 (.04, .14)	χ^2 = 89.59 df = 59 RMSEA: .10 (.05, .14)	4.26 for 4, ns
Autonomy	Autonomy4 on Contact4 = 21	χ^2 = 47.42 df = 32 RMSEA: .09 (.03, .14)	χ^2 = 38.32 df = 31 RMSEA: .06 (.00, .12)	9.10 for 1***

Note. df = degrees of freedom; RMSEA = root mean squared error of approximation. The number following the composite and Contact variable refers to the occasion of measurement.
* = $p < .05$, *** = $p < .001$

Part IV

Intraindividual Variation

In order to study the bivariate emotional dynamics of intraindividual variation, six DFAs were conducted representing the pairing of each of the four main diary composites (i.e., Love and Sadness, Love and Anger, Love and Autonomy, Sadness and Anger, Sadness and Autonomy, Anger and Autonomy). Because DFA hinges on the daily assessment of lagged covariance, individuals not expressing variability on single or multiple items were dropped from these analyses. For example, if a participant recorded a single choice for feeling "Sad" every day of the diary period, this person was removed from all analyses that included this item. Thus, in order to ensure the largest possible sample size, item selection was the first step in conducting these analyses. Given concerns about variability and the large number of participants reporting single responses (i.e., no variance) for multiple items, 12 items were selected for the present analyses (3 chosen to represent each of the 4 emotional composites). These items and the number of people reporting zero variability are presented in Appendix C, Table C9.

To complete the DFAs, the following procedure was conducted: (a) Each item was regressed on time to remove the linear trend and the standardized residuals were retained for analysis; (b) A pool of eligible participants was selected based on the pairing of six affect items (three items for each scale of interest). The available pool began with the entire sample of 58 and was reduced by eliminating each person reporting zero variability on any one of the six possible items. The resulting pool of eligible participants thus represented individuals who reported variability on each of the six affect items. This strategy of participant elimination was conducted separately for each composite pairing; thus, eligible individuals

for the Sadness/Autonomy analysis may have been different than those eligible for the Sadness/Anger analysis; (c) A series of block-Toeplitz lagged covariance matrices were computed for each individual and then compared statistically to determine if the structure of dynamics at the individual level was sufficiently homogeneous to concluded that these participants could be treated as sharing a common structure. This iterative process eliminated participants who were significantly different until a group of *not* significantly different individuals remained; and (d) Once the largest poolable group was statistically identified (which amounts to concatenating lagged covariance matrices), a series of DFAs were conducted to examine the bivariate patterning of emotional variability. These analyses are reported here.

For each DFA pairing, several alternative models were examined. The first model always specified as a single factor, two-lagged DFA represented by the following notation: DFA (1, 2). This model indicates that the items covary as a single factor operating across all occasions of measurement and that item scores at any given time are derived the factor at that time (i.e., lag 0) as well as the factor at the previous occasion (i.e., lag 1). Because this study focuses on daily observations, another way of describing this notation would be to say that the items load on their factor today as well as their factor yesterday. This model is equivalent to adding lagged factor loadings to the more traditional P-technique factor model (see Nesselroade & Molenaar, 1999). The second model, DFA (2, 2), re-specified the factor loading pattern and allowed the items to load on the measures that they were designed to assess. The same lagged relations were modeled; however, they now operated within factors such that each item score was derived by its own factor scores at lag 0 and lag 1. If the second model provided an improved fit to the covariance matrix, nested models were

examined that allowed for cross-factor loadings. These final models are of considerable substantive interest for the study of post-dissolution affect. For example, consider a DFA (2, 2) with cross-loadings between the Love and Sadness. The first question one can ask is whether the Sadness items today are influenced by the Sadness factor today, Sadness factor yesterday, as well as Love factor today? We would say that this model includes cross-factor loadings *within occasions or lags.* This model can be extended to assess *lagged* cross-loadings; for example, are Sadness items today influenced by the Sadness factor today, the Sadness factor yesterday, and Love yesterday? In general, then, DFA allows for the characterization emotional patterning over time for small sub-groups of similarly varying individuals. For the present analyses, 25 of the 58 total participants were selected for one of the six DFAs.

Love and Sadness. For this analysis, the iterative search process identified 6 of 34 eligible people as demonstrating statistically similar variability, and the DFAs were conducted on 165 total observations, which equals the number of occasions for each participant multiplied by the number of participants, less a correction for average missingness per person. For DFA, the observations, rather than number of participants, are the units of measurement; thus, 165 represents a rather large sample of observations, although the number of participants included in the analysis is small by conventional standards. The fit statistics for three alternative DFAs are presented in Table 19. For each DFA, the item uniquenesses were allowed to covary with themselves within and across time (see Figure B1 in Appendix B). Although the fit statistics do not indicate that the DFA (2, 2) provided a much improved fit over the DFA (1, 2), adding within lag cross-loadings (Model

3, Table 19) improved the overall model fit considerably. As indicated by the NFI and RMSEA, Model 3 fit the data moderately well.

Table 19

Alternative Model Fit Statistics for DFA of Love and Sadness

	Model 1: DFA (1,2)	Model 2: DFA (2,2)	Model 3: DFA (2,2,x0)[a]
$\chi 2$ (*p* –value)	84.14 (.000)	79.69 (.000)	48.22 (.005)
df	33	32	26
NFI	.75	.76	.85
RMSEA (90% CI)	.09*	.08*	.06 (.03, .10)

Note. df = degrees of freedom; NFI = Normed Fit Index; RMSEA = root mean squared error of approximation. * The p-value was too small to compute confidence intervals. [a]This "x0" notation was implemented for the present study to indicate cross-loadings at lag0. For example, today's observed scores on Love items load on today's Love factor score, *today's Sadness factor score*, and yesterday's Love factor score.

The parameter loading estimates for the best fitting model are shown in Table 20. The values displayed in each cell represent the standardized loadings (the standard errors in parentheses) and, below them, the ratio of the loading to the standard error (which is *t* distributed). As reported in the subsection on *Growth*, ratios of greater than +/- 1.96 are considered statistically significant. To ease interpretation, only the factors and item loading patterns are presented in the table. As shown in the table, Seek Out and Hard Without loaded significantly on the Love factor today (lag 0), whereas the Confided By is not defined by the Love factor score today, but instead loads significantly on the Love factor yesterday (lag 0). Note that the signs switch for the lag 0 and lag 1 loadings of Hard Without on the Love. In addition, the Sadness factor today is strongly associated with Seek Out and Hard Without

items scores today, indicating that feelings of Love at any given occasion are defined not only by the Love factor by also the Sadness factor.

The same pattern of cross-loadings held true for Sadness. As shown in the bottom three rows of the Love0 column, the more individuals feel Love today, the greater their scores on the Sadness items today. Importantly, the Unhappy item is defined entirely by the cross-loading. Unhappiness scores at any given time are dependent on the Love factor score at that occasion. (The overall model fit was degraded when re-specified to allow Unhappy to load on Love.) The Sad and Lonely items also have stronger lagged than concurrent relations with the Sadness factor, indicating that throughout this measurement period, individuals' reports of feeling Sad and Lonely are more highly influenced by their Sadness yesterday than their feelings today. For this sub-group, the influence of the Sadness factor persisted at least two days.

Table 20

Factor Loading Pattern for Bivariate DFA with Cross Factor Loadings Within Occasion: Love and Sadness

	Love0	Sad0	Love1	Sad1
Confided By	.03 (.05) .54	-.01 (.08) -.13	.17 (.08) 2.29	--
Seek Out	.20 (.10) 2.01	.55 (.12) 4.72	-.09 (.06) -1.42	--
Hard Without	.20 (.10) 2.06	.42 (.11) 3.79	-.18 (.08) -2.42	--
Sad	.43 (.13) 3.34	.33 (.17) 1.97	--	.46 (.10) 4.39
Unhappy	1.33 (.36) 3.68	-.19 (.52) -.36	--	-.25 (.14) -1.85
Lonely	.23 (.09) 2.52	.26 (.11) 2.33	--	.41 (.10) 4.28

Note. Diary items are reported in rows; emotion factors in columns.

Love and Anger. For this analysis, the iterative search process identified 7 of 34 eligible people as demonstrating statistically similar variability, and the DFAs were conducted on 190 total observations. The fit statistics for three alternative models are presented in Table 21. Model 2 provided a significant improvement over the single factor model, indicating that the items reliably loaded on two distinct constructs. Model 3, which is nested under Model 2, improved the overall fit and was thus retained as the best fitting model ($\Delta X^2 = 8.84$ for 3 df, $p < .05$). The notation, DFA (2, 2, x1), indicates that a two factor, two lag (i.e., lag 0 and lag 1) model with cross-loadings at lag 1 provided the best fit to the data. Lagged cross loading parameters describe the extent to which today's items load on the opposite factor at the previous occasion. Within the final model, the cross-loading is partial, indicating that the Anger1 factor was specified to load on the concurrent Love items but the Love1 factor was not allowed to load on the concurrent Anger items.

Table 21

Alternative Model Fit Statistics for DFA of Love and Anger

	Model 1: DFA (1,2)	Model 2: DFA (2,2)	Model 3: DFA (2,2,x1) [a]
$\chi 2$ (p –value)	74.80 (.000)	35.09 (.32)	26.21 (.58)
Df	33	32	29
NFI	.78	.90	.93
RMSEA (90% CI)	.08*	.01 (0.0, .056)	0.0 (0.0, 0.04)

Note. df = degrees of freedom; NFI = Normed Fit Index; RMSEA = root mean squared error of approximation. * Confidence intervals not available for these models due to small p-values; [a] This "x1" notation was implemented for the present study to indicate cross-loadings at lag1. For example, today's observed scores on the Love items are defined by today's Love factor score, yesterday*'s Anger factor score*, and yesterday's Love factor score.

As shown in Table 22, Love0 is strongly defined by its three items at lag 0, but only Confided By loads on the Love factor at the previous occasion. Additionally, the Confided By item loaded significantly on Anger at Lag 1. Together, these lagged loadings indicate that the Confided By item significantly influenced by today's Love factor, yesterday's Love factor score, as well as yesterday's Anger score. The more these 11 participants experienced Anger yesterday, the high their reports of wanting to be Confided By their former partners today. The Anger0 factor was defined by high loadings on each of its items. These items were influenced by the Anger factor at the current occasion, and reports of feeling Peeved and Annoyed were also loaded on the Anger factor score at the previous occasion.

Table 22

Factor Loading Pattern for Bivariate DFA with Lagged Cross-Factor Loadings: Love and Anger

	Love0	Anger0	Love1	Anger1
Confided By	.34 (.10) 3.39		.42 (.12) 3.37	.24 (.11) 2.15
Seek Out	.77 (.15) 4.96		.07 (.16) .45	-.08 (.10) -.73
Hard Without	.34 (.08) 4.30		.10 (.09) 1.12	-.11 (.10) -1.15
Angry		.52 (.08) 6.26		-.01 (.11) -.10
Peeved		.62 (.10) 6.43		.42 (.12) 3.58
Annoyed		.55 (.09) 6.40		.30 (.11) 2.73

Note. Diary items are reported in rows; emotion factors in columns.

Love and Autonomy. For this analysis, the iterative search process identified 10 of 42 eligible people as demonstrating statistically similar variability, and the DFAs were

conducted on 275 total observations. The fit statistics for three alternative models are presented in Table 23. As shown, the DFA (1, 2) provided a poor to the data and adding a second factor (Model 2) improved the fit considerably. Model 3 is nested under Model 2 and further improved the fit to the data ($\Delta X^2 = 11.62$ for 3 df, $p < .05$).

Table 23

Alternative Model Fit Statistics for DFA of Love and Autonomy

	Model 1: DFA (1, 2)	Model 2: DFA (2, 2)	Model 3: DFA (2, 2, x1)
$\chi 2$ (*p* –value)	156.34 (.000)	56.05 (.005)	44.43 (.03)
Df	33	32	29
NFI	.63	.92	.94
RMSEA (90% CI)	.12*	.08 (.02, .07)	.04 (.00, .06)

Note. df = degrees of freedom; NFI = Normed Fit Index; RMSEA = root mean squared error of approximation. * Confidence intervals not available for these models due to small p-values. The "x1" notation was implemented for the present study to indicate cross-loadings at lag1.

The parameter estimates for this Model 3 are shown in Table 24. Again, a lagged partial cross-loading model provided the best fit: Love at the previous occasion was permitted to load on the Autonomy items today; however, Autonomy at the previous occasion was not permitted to load on the Love items today. This model provides an empirical picture of the way the absence of Love drives feelings of Autonomy. As shown in the table, each of the Love items loaded strongly at the current occasion and the previous occasion. The Autonomy items loaded strong on the Autonomy factor today, but only today's report of feeling Free was defined by yesterday's Autonomy factor. In addition, Free and Strong Yesterday's loaded on lag1 Love. Specifically, the higher individuals' Love factor scores yesterday, the less they reported feeling Free or Strong today. Another way of

describing this pattern of emotional variation is to say that, for this sub-sample of 10 participants, Love is a driving force in the bivariate system.

Table 24

Factor Loading Pattern for Bivariate DFA with Partial Cross Factor Loadings Across Occasions: Love and Autonomy

	Love0	Autonomy0	Love1	Autonomy1
Confided By	.40 (09) 4.51		.38 (.10) 4.00	
Seek Out	.60 (.11) 5.37		.63 (.12) 5.32	
Hard Without	.34 (.09) 3.63		.47 (.10) 4.81	
Relieved		.52 (.08) 6.45	.04 (.08) .54	.08 (.07) 1.12
Free		.82 (.10) 7.92	-.25 (.09) -2.69	.32 (.10) 3.14
Strong		.43 (.07) 5.80	-.18 (.08) -2.24	.12 (.07) 1.64

Note. Diary items are reported in rows; emotion factors in columns.

Sadness and Anger. For this analysis, the iterative search process identified 7 of 33 eligible participants as demonstrating statistically similar variability, and the DFAs were conducted on 190 total observations. The fit statistics for three alternative models are presented in Table 25. As shown, the single factor and two factor models (Models 1 and 2) fit the data about equally and relatively poorly. Freeing three parameters in the form of a cross-lagged loading from lag 1 Anger factor to the lag 0 Sadness items led to a considerably better fit (Model 3), and this structure was retained as the best fitting model.

Table 25

Alternative Model Fit Statistics for DFA of Sadness and Anger

	Model 1: DFA (1,2)	Model 2: DFA (2,2)	Model 3: DFA (2, 2, x1)
$\chi 2$ (*p* –value)	98.78 (.000)	98.19 (.000)	42.61 (.05)
df	33	32	29
NFI	.90	.90	.96
RMSEA (90% CI)	.10*	.09*	.04 (0.0, .07)

Note. df = degrees of freedom; NFI = Normed Fit Index; RMSEA = root mean squared error of approximation.
* Confidence intervals not available for these models due to small p-values. The "x1" notation was implemented for the present study to indicate cross-loadings at lag1.

The parameter estimates for Model 3 are shown in Table 26. All three Sadness items loaded on the Sadness factor concurrently; however, only the Lonely item loaded on Sadness at lag 1. Two of the Sadness items loaded on Anger at lag 1, and this pattern operated in opposite directions for each item. Reports of feeling Sad were positively influenced by the Anger factor scores at the previous occasion; reports of feeling Lonely, however, were negatively influenced by the Anger factor score at the previous occasion. Thus, for this sub-group, individuals' reports of feeling Lonely were highly associated with their Sadness factor scores today and yesterday, but negatively associated with Anger yesterday. The more one of these seven participants reported feeling Anger yesterday the less they reported feeling Lonely today. In contrast, the higher participants' Anger factor yesterday, the more they reported feeling Sad today. In addition to this pattern for the Sadness items, the Anger items were defined by high loadings on the Anger factor at lag 0 and higher loadings on Anger at lag 1, suggesting a very strong pattern of autocorrelation in individuals' reports of feeling

Angry, Peeved, and Annoyed. In this sub-group, the influence of the Anger factor persisted strongly over time.

Table 26

Factor Loading Pattern for Bivariate DFA with Partial Cross Factor Loadings Across Occasions: Sadness and Anger

	Sad0	Anger0	Sad1	Anger1
Sad	.53 (.08) 6.38		.17 (.10) 1.73	.52 (.10) 5.38
Unhappy	.69 (.08) 7.92		.15 (.10) 1.44	-.12 (.10) -1.25
Lonely	.61 (.08) 7.17		.22 (.11) 2.13	-.19 (09) -1.99
Angry		.41 (.07) 6.08		.70 (.07) 9.68
Peeved		.38 (07) 5.24		.78 (08) 10.93
Annoyed		.46 (.06) 6.68		.69 (.07) 9.41

Note. Diary items are reported in rows; emotion factors in columns.

Sadness and Autonomy. For this analysis, the iterative search process identified 11 of 38 eligible participants as demonstrating statistically similar variability, and the DFAs for were conducted on 297 total observations. The fit statistics for three alternative models are presented in Table 27. As shown, the one factor model provided a poor fit to the data and allowing items to load on the two hypothesized constructs provided a large improvement as indicated by the statistics for Models 1 and 2. A third model was then specified that allowed for partial cross-loadings at lag 0 from the Sadness factor to the Autonomy items. Model 3, which is nested under Model 2, provided a significant improvement in fit ($\Delta X^2 = 15.62$ for 3 df, $p < .05$).

Table 27

Alternative Model Fit Statistics for DFA of Sadness and Autonomy

	Model 1: DFA (1, 2)	Model 2: DFA (2, 2)	Model 3: DFA (2, 2, x0)
$\chi 2$ (*p* –value)	99.21 (.000)	49.97 (.02)	34.53 (.22)
Df	33	32	29
NFI	.76	.92	.94
RMSEA (90% CI)	.08*	.04 (.01, .06)	.02 (.00, .05)

Note. df = degrees of freedom; NFI = Normed Fit Index; RMSEA = root mean squared error of approximation. * Confidence intervals not available for these models due to small p-values. The "x0" notation was implemented for the present study to indicate cross-loadings at lag0.

The parameter estimates for Model 3 are presented in Table 28. As shown, all three of the Sadness items loaded strongly on the Sadness factor at lag 0. In addition, the Lonely item loaded on the Sadness factor at lag 1. The Autonomy0 factor was well defined by strong loadings with the concurrent items. Item reports of feeling Relieved and Free also loaded on lag 1 Autonomy, indicating that today's reports of feeling Relieved and Free are influenced both by today's Autonomy factor score as well as yesterday's factor score. In addition, Free and Strong loaded on the Sadness factor at lag 1. The greater individuals' Sadness factor score, the less individuals reported feeling Free and Strong. It is notable that the best fitting model does not include a cross-loading relation for Autonomy's influence on Sadness items. For this sub-group, the Sadness factor contributes to the Autonomy items; the Autonomy factor does not contribute the Sadness item scores.

Table 28

Factor Loading Pattern for Bivariate DFA with Partial Cross-Factor Loadings Within Occasions: Sadness and Autonomy

	Sadness0	Autonomy0	Sadness1	Autonomy1
Sad	.62 (.06) 9.65		.04 (.07) .55	
Unhappy	.75 (.07) 8.40		.12 (.08) 1.56	
Lonely	.54 (.06) 8.40		.18 (.07) 2.52	
Relieved	-.26 (.15) -1.77	.57(.13) 4.49		.29 (.11) 2.17
Free	-.43 (.16) -2.75	.62 (.13) 4.69		.35 (.11) 3.27
Strong	-.42 (.13) -3.32	.48 (.11) 4.54		.14 (.09) 1.47

Note. Diary items are reported in rows; emotion factors in columns.

Anger and Autonomy. For this analysis, the iterative search process identified 6 of 41 eligible participants as demonstrating statistically similar variability, and the DFAs were conducted on 165 total observations. The fit statistics for two alternative models are presented in Table 29. As show, the DFA (1, 2) provided a weak fit to the data. Allowing for an additional factor improved the fit considerably (see Model 2). Several nested alternative specifications (that included cross-loadings within and across lags) were examined to improve upon Model 2, but none yielded an overall better fit. Model 2 was thus retained as the best fitting and most parsimonious DFA for the Anger and Autonomy combination.

Table 29

Alternative Model Fit Statistics for Dynamic Factor Analyses of Anger and Autonomy

	Model 1: DFA (1, 2)	Model 2: DFA (2, 2)
$\chi 2$ (*p* –value)	59.68 (.00)	34.67 (.34)
df	33	32
NFI	.88	.93
RMSEA (90% CI)	.06 (.04, .10)	.02 (.00, .06)

Note. df = degrees of freedom; NFI = Normed Fit index; RMSEA = root mean squared error of approximation. * Confidence intervals not available for these models due to small p-values.

The parameter estimates for Model 2 are presented in Table 30. Each of the three Anger items loaded strongly on the Anger factor at lag 0 as well as lag 1. In fact, for this sub-group, concurrent item reports of feeling Angry, Peeved, and Annoyed were more highly associated with yesterday's Anger factor than today's Anger factor, indicating that the strength of the Anger factor persisted over two occasions for these items (when considered with the Autonomy items). Each of the Autonomy items loaded strongly on the Autonomy factor at lag 0, and the Free and Strong items also loaded on the lag 1 Autonomy factor, indicating that individuals' reports of feeling Free and Strong were influenced by both today's and yesterday's Autonomy factor.

Table 30

Factor Loading Pattern for Bivariate DFA: Anger and Autonomy

	Anger0	Autonomy0	Anger1	Autonomy1
Angry	.20 (.09) 2.20		.59 (.09) 6.79	
Peeved	.30 (.09) 2.23		.70 (.09) 7.66	
Annoyed	.20 (.09) 2.23		.61 (.09) 6.57	
Relief		.62 (.08) 8.07		.17 (.10) 1.76
Free		.80 (.08) 9.45		.27 (.11) 2.58
Strong		.52 (.08) 6.60		.23 (.10) 2.36

Note. Diary items are reported in rows; emotion factors in columns.

Summary of Dynamic Factor Analyses. The six DFAs conducted here with 12 different variables yielded a large number of results. Table 31 summarizes of the best fitting models for each pairing of emotional composites. Five of the six models included cross-loading parameters, either within or across lags. In four of these models, the cross-loading was partial rather than full. The substantive significance of this (partial loading) parameterization reveals how specific emotions can drive other emotions within these sub-groups. Consider, for example, the DFA for Sadness/Anger. For the sub-group of 7 individuals, the Anger factor at the previous occasion loaded significantly on 2 of the 3 Sadness items over 190 observations. Sadness at lag 1 was not associated with concurrent reports of Anger. For this sub-group, then, there was strong evidence that Anger drives Sadness and not the other way around. In general, partial cross-loadings point to one avenue in which individual emotions may drive emotional systems.

Table 31

Summary of Best Fitting DFA Models with Emphasis on Cross-Loadings

Emotion Pairing	Best Fitting DFA Model	Number of Participants/Total Observations	Notes on Cross Loadings
Love/Sadness	2,2,x0	6/165	Full within lag. Love0 → Sad items; Sad0 → Love items
Love/Anger	2,2,x1	7/190	Partial across lags. Anger1 → Confided By
Love/Autonomy	2,2,x1	10/275	Partial across lags. Luv1 → Autonomy items
Sadness/Anger	2,2,x1	7/190	Partial across lags. Anger1 → Sadness items
Sadness/Autonomy	2,2,x0	11/296	Partial within lag. Sad0 → Autonomy items
Anger/Autonomy	2,2	6/165	No cross loadings.

Note. The DFA specification refers to number of factors, number of lags, and presence of cross-loadings, respectively. Cross-loadings x0 and x1 refer to loadings from factors to items within and across lags, respectively.

Another way to summarize these analyses is to consider the items and how they load on the factors within and across occasions. Table 32 summarizes the data in this way. The first two columns show whether the item loaded on its hypothesized factor at lag 0 and lag 1, respectively; the second two columns describe the item cross-loadings on other factors within and across occasions. The first two columns list the name of the other factor in the bivariate model. For example, Lonely loaded on its hypothesized factor (Sadness) at lag 0 and lag 1 in every bivariate model. In contrast, Seek Out loaded on Love at lag 0 when considered with all other emotions, but only loaded on the Love at lag 1 when considered with Autonomy. The second two columns are read differently by considering how the items cross-loaded. Free, for example, loaded negatively on the Sadness factor at lag 0 and negatively on the

Love factor at lag 1. Thus, the first two columns can be interpreted with the phrase "when considered with" and the final two columns can be interpreted with the phases "loads on" or "influenced by."

Four patterns are noteworthy in Table 32. First, Anger was well-defined by its own items at lag 0 and lag 1. With the exception of the Angry item (at lag 1) when considered with Love, all the items loaded on the Anger factor across two lags. When considered with Autonomy, the Anger items loaded stronger at lag 1 than lag 0. Moreover, while three different items (i.e., Confided By, Sad, and Lonely) loaded on the Anger factor at lag 1, none of the Anger items cross-loaded with other factors, either within or across occasions. This suggests that Anger cross-loads on other items but its items are not influenced by other factors. Second, as mentioned previously, the table makes obvious the way reports of feeling Free and Strong (Autonomy items) are influenced by the absence of Sadness at lag 0 and the absence of Love at lag 1. Autonomy items are, in part, driven by the absence of Sadness and the absence of Love. In these sub-groups, participants reported high levels of Autonomy when not feeling Love or Sadness. Third, the Sadness factor was well-defined by its items at lag 0 when paired with every other emotion. Furthermore, each of the Sadness items load on the Love factor at lag 0, and Sad and Lonely load on Anger at lag 0 as well. Thus, for these sub-groups, Sadness items are influenced by both the Love and Anger factors. Finally, the only pattern of complete cross-loaded was observed for the pairing of Sadness and Love. Both factors were highly associated with the other factor's items over time, suggesting that, for this sub-group, the Sadness factor drives the Love items and the Love factor drives the Sadness items.

Table 32

Summary of Item Functioning in DFA Models

Item (hypothesize factor)	**From hypothesized factor at lag 0 when considered with:**	**From hypothesized factor at lag 1 when considered with:**	**Cross-loadings at lag 0 (within occasions). Loads on:**	**Cross-loadings at lag 1 (across occasions). Loads on:**
Confided By (Love)	Anger Autonomy	Sadness Anger Autonomy		Anger
Seek Out (Love)	Sadness Anger Autonomy	Autonomy	Sadness	
Hard Without (Love)	Sadness Anger Autonomy	Sadness	Sadness	
Sad (Sadness)	Love Anger Autonomy	Love	Love	Anger
Unhappy (Sadness)	Love Anger Autonomy		Love	
Lonely (Sadness)	Love Anger Autonomy	Love Anger Autonomy	Love	Anger (-)
Angry (Anger)	Love Sadness Autonomy	Sadness Autonomy		
Peeved (Anger)	Love Sadness Autonomy	Love Sadness Autonomy		
Annoyed (Anger)	Love Sadness Autonomy	Love Sadness Autonomy		
Relieved (Autonomy)	Love Sadness Anger	Sad		
Free (Autonomy)	Love Sadness Anger	Love Sadness Anger	Sad (-)	Love (-)
Strong (Autonomy)	Love Sadness Anger	Love Anger	Sad (-)	Love (-)

Discussion

The Virginia Dissolution Study examined the emotional experiences of 58 young adults in the month following the break-up of a close romantic relationship. The chief findings revealed that attachment styles and coping strategies were highly related to psychological outcomes and the daily experience of affect; post-dissolution grief processes involved a qualitative reorganization in the structure of emotional experience over time; the emotional trajectories of the diary composites were characterized by different patterns of growth and associated with different covariates; and among empirically-derived sub-groups, cross-factor loadings between the emotional constructs improved overall model fit. These findings and their substantive implications, as well as other meaningful results, are discussed as they relate to the four general research questions of this study. Each section also includes a review of the specific hypotheses. The paper closes with mention of the study's limitations and future directions for research in this area.

Research Question 1: Descriptive Analyses and Mental Health Outcomes

The first set of hypotheses focused on the cross-sectional relations between the covariates and mental health outcomes. Specifically, it was hypothesized that at both entry into the study and at the Day_28 follow-up, participants who initiated the separation and reported secure attachment styles would report less distress, while participants reporting insecure attachment styles, greater levels of neuroticism, and dating their partners for longer periods of time would report more break-up related and generalized mood disturbance. Support for these predictions was mixed. Participants who reported initiating the break-up

reported less nonacceptance of relationship termination and generalized disturbance at entry into the study, but not significantly lower levels of emotional intrusion. Participants who initiated the separation also reported significantly lower mean levels of feeling "Miserable Without," Hopeless, Helpless, Discouraged, and Unworthy in the daily diary. These findings are consistent with previous research on both non-marital and divorcing samples, which has also found that individuals who initiate the separation report less psychological distress (and, by extension, that participants who feel left by their partner report more distress). Frazier and Cook (1993), for example, found that controllability of the break-up was significantly associated with distress within six months of a separation experience. Up to 5 years after divorce, Wang and Amato (2000) found that women who initiated the separation reported less preoccupation with their former partners and better general adjustment. Studies by both Black et al. (1991) and Crosby et al. (1987) reported that adults who perceived themselves as the leaver were more positive in their attitude toward the divorce than those who were left (also see Thompson & Spanier, 1983). Despite the consistency between the present findings and previous reports, discrepancies also exist. There were no significant relations, for example, between initiator status and mean scores on any of the four diary composites. Participants who initiated the break-up did not report *less* daily mood disturbance than individuals who felt they were left.

Differences in the psychological experiences of the leavers and the left raises a potentially important methodological point not yet addressed in this area of study. Similar to the way investigations of marital satisfaction or the prediction of divorce end when a relationship dissolves, studies of dissolution-- the present study included-- typically begin when a relationship ends or at some point within a year of the separation. While

retrospective studies of relationship dissolution are clearly limited, even prospective studies that begin the day the relationship "officially" ends are less than ideal. Thorough study of divorce and break-up related grief should begin well before physical separation. Both Emery (1994; Emery & Sbarra, 2002) and Vaughan (1986) have outlined a variety of ways in which the person initiating the separation slowly distances themselves from and grieves the end the relationship prior to the physical separation. Without studying intact relationships, researchers interested in the dynamics of dissolution will capture only half the process at best and misrepresent the experience at worst. The lack of significant correlations between relationship length and psychological adjustment reinforces this idea. As noted in the *Results*, a number of participants dissolving longer relationships reported little psychological distress. It is plausible that these individuals experienced the height of their distress prior to the separation event, and, upon breaking-up, reported few problems of adjustment and considerable Autonomy. The complete study of relationship dissolution should therefore span the transition from couplehood to singlehood.

Attachment. Consistent with the hypotheses, self-reported attachment security was significantly negatively associated with nonacceptance of relationship termination at entry into the study (but not the follow-up) and emotional intrusion and generalized disturbance at both assessments. Participants reporting a secure attachment style also reported more positive affect at both occasions. These correlations extended to the mean diary reports as well: Attachment security was negatively associated with mean Sadness, mean Sadness variability, and positively associated with Autonomy and Autonomy variability. In contrast to the prediction that anxious/preoccupied participants would report worse outcomes, there were no significant relations between attachment preoccupation and any of the non-diary or

diary outcomes. Participants reporting a fearful style reported significantly more generalized disturbance at entry into the study and significantly less mean daily Autonomy, which is consistent with literature indicating the that fearful-avoidance is characterized by high both anxiety and avoidance (Bartholomew & Horowitz, 1991; Fraley & Shaver, 2000).

Several studies have reported that attachment security is associated with adaptive outcomes following relationship dissolution (see Birnbaum et al., 1987; Pistole, 1995; Simpson, 1987). In general, the available evidence suggests that secure individuals fare better following stressful life events due to their ability to more effectively regulate their emotions, especially in situations that present relationship-specific threats (Diamond, 2001; Feeney, 1995; Kobak & Screery, 1988; Mikulincer et al., 1990; Simpson & Rholes, 1998). With respect to breaking-up, security appears protective, helping individuals negotiate the transition out of a relationship without getting tangled in nonacceptance or haunted by recurring, painful images of the break-up experience.

One possible route connecting security and well-being is through cognition and response-focused emotion regulation (Gross, 1999, 2001). Secure individuals may adopt a flexible and fluid strategy toward regulating their affect that allows them to calm themselves via cognitive-emotional narratives while simultaneously making use of other adaptive coping mechanisms. Stemming directly from their working models of self and other relationships, secure individuals are more capable of reminding themselves they will survive the break-up, meet someone new, and ultimately be happy again. Indeed, a working model of oneself as lovable, worthy, and agentic may help secure individuals maintain emotional coherence and organization in times of stress. Adaptive coping such as this could be considered the opposite of rumination (see Nolen-Hoeksema, 1994), which entails a passive preoccupation

with how bad one feels. In the present study, it is important to note that no support was found for the opposite argument, that anxiously attached participants would show a hypervigilance to negative affect and thereby maintain break-up related affective dysregulation. Although having a fearful attachment style was associated with generalized disturbance and significantly less mean Autonomy, no other significant relations were observed between the three types of insecure attachment and the break-up related outcomes. Thus, from this investigation, the presence and absence of security appears to confer protection and risk in a more systematic fashion than insecure attachment.

Personality and coping. Mixed support was found for the hypothesis that self-reported personality would be associated with dissolution-related distress and, specifically, that neuroticism would be positively correlated with the negative outcome variables. Neuroticism was positively associated with generalized disturbance and negatively associated with PA at entry into the study and the Day_28 follow-up, but not significantly related to either of the break-up related outcomes. The correlation with generalized disturbance is consistent with neuroticism being a trait-level propensity to experience negative affect. Interestingly, this propensity did not extend to the relationship specific outcomes. One explanation is that while neuroticism is associated with generalized mood disturbance, relationship factors (e.g., initiator status, pre-dissolution closeness, attachment style) are more proximally related to break-up specific outcomes than personality (see Shaver & Brennan, 1992).

Although this explanation may be tenable for neuroticism, self-reported Agreeableness and nonacceptance of relationship termination were positively correlated at entry into the study and at the follow-up. Highly agreeable individuals actively approach

others, are tender-minded, altruistic, and generally compliant (Costa & McCrae, 1992). When the relationship dissolves, persons who exhibit this personality style may express more nonacceptance because they find themselves acquiescing to their former partner's desires rather than focusing on their own needs and self-regulation. This formulation is consistent with the association between pathological Agreeableness and Dependent Personality Disorder (Costa & McCrae, 1990).

In addition to the cross-sectional relations among personality and the outcome variables, self-reported coping emerged as significantly associated with the non-diary and diary outcomes. Both self-blame and avoidance were positively correlated with nonacceptance, generalized disturbance, intrusion, and negatively associated with positive affect at entry into the study and at the follow-up. Participants who reported blaming themselves for the break-up also reported greater mean Love, greater mean Sadness and Sadness variability, and less mean Autonomy, while those adopting an avoidant coping strategy (that included attempting to distract oneself, overt denial of any painful feelings, and ignoring any reminders of the break-up) reported significantly more Sadness and Sadness variability, as well as Anger and Anger variability.

Considering the relations between coping and psychological adjustment immediately raises the question of causality. Does avoidance, for instance, ultimately cause individuals to feel worse about their break-up or are individuals engaging in avoidant strategies because they are experiencing a particularly difficult separation? Although the present investigation offers little by way of addressing this question and the directionality issue clearly needs further study, research has demonstrated that adaptive coping typically consists of an appropriate balance between approaching negative affect (without overwhelming one's

capacity to tolerate sadness and anger) and distancing oneself from pain (without ignoring it). Stroebe and Schut's (1999) dual process model (DPM) of coping with bereavement underscores the idea that adaptive strategies are both loss- and restoration-oriented. In the language of the DPM, persons adopting a purely avoidant coping style are inflexibly restoration-oriented, seeking only to "get over" the loss without experiencing the necessary grief.

The strong association between avoidance and poor psychological outcomes does not suggest these individuals need to "work through" or experience their emotions more deeply following a break-up. Indeed, there is fair deal of controversy surrounding the grief work notion that one must confront, process, and re-organize their painful emotions in order to effectively grieve (Bonanno & Kaltman, 1999; Wortman & Silver, 2001, 1989), and a recent study of a large sample of bereaved widows found no support for the idea that emotional disclosure and processing facilitates adjustment (Stroebe et al., 2002). Thus, while the results of this study do not imply that a deeper processing is needed to emotionally recovery from a loss event, the findings do contrast with research suggesting that avoidant coping can be adaptive following loss (see Bonanno et al., 1995).

Comparisons to the dating sample. The prediction that participants in the dissolution sample, compared to the dating sample, would report greater means levels of negative affect and greater daily variability on each of the negative affect items was partially supported. Participants in the dissolution sample reported significantly more negative affect, but not for every diary item. No differences between samples were observed for reports of feeling Grouchy, Helpless, Furious, or Unworthy. With the exception of "Enjoy being confided by him/her," participants in the dating sample reported greater mean scores on each of the Love

items. Participants in the dissolution sample also reported greater mean variability on each of the negative affect diary reports (with the exception of Grouchy and Resentful).

Taken together, these findings suggest that the emotional experiences of individuals who have recently ended a serious relationship are greatly displaced from their normative baseline. The ability to make comparisons with an intact dating sample is a notable strength of the present study. Particularly interesting is the degree of daily variability expressed by the participants in the dissolution sample. While the dating sample evidenced relatively small mean standard deviations in their self-reported affect over time, participants in the dissolution sample reported large variations in daily affect. Emery's (1994) model of post-dissolution emotional experience contends that individuals in the midst of dissolving a relationship experience considerable vacillations in their emotions over time. The large level of emotional variability observed in the dissolution sample supports this idea and underscores that one of the central features of dissolving a love relationship is a dysregulation of affect characterized by large swings in emotion and considerable day-to-day variability. These patterns can be observed from even a cursory examination of the individual plots in Appendix D. Importantly, though, the extent of this dysregulation or disorganization can only be demonstrated empirically in comparison to how individuals regulate their emotions in intact relationships; without the comparison sample, the degree of disturbance would not be apparent. This research is the first to include a prospective comparison group when assessing the emotional experiences of breaking-up.

Predicting mental health outcomes: A focus on variability. In addition to comparing variability in the dissolution and dating samples, one of the central questions of this study was whether patterns of intraindividual variation predict between-persons differences in

psychological adjustment. Specifically, it was hypothesized that variability in Love, Anger, and Sadness would significantly predict the non-diary outcomes at Day_28. Support for this hypothesis was limited. Using hierarchical regression, Sadness variability was significantly associated with generalized disturbance (after controlling for mean Sadness). In addition, mean variability in Love and Autonomy were significant predictors of positive affect. Neither of the two break-up related outcomes was associated with emotional variability as reported in the daily diary.

Finding that Sadness variability explained significant variance in generalized disturbance at Day_28 supports the notion that patterns of within-person variation can operate as important between-persons predictors (see Eizenman et al., 1997). The extent to which participants varied in their reports of Sadness was a critical factor in predicting depression and anxiety over time, explaining 7% of the adjusted variance in generalized distress beyond the effects of self-blame and mean Sadness. This perspective on intraindividual variability as a predictor psychological adjustment offers a potentially new way of thinking about how adults regulate their emotions following stressful life events. Divorcing adults commonly report feeling lost, confused, misdirected, and completely emotionally scattered and fragmented (Weiss, 1975, 1988). Hetherington and Kelly (2002) recently suggested that this type of emotional lability is much more of the norm than the exception in the first year after divorce. Put colloquially, individuals in the throws of separation spend a great deal of time not knowing if they are coming or if they are going--they are emotionally off-balance. While these ideas are appealing from a clinical perspective, few investigations have tackled them empirically and even fewer efforts have been made to conceptualize this process as one of basic emotion regulation. The evidence

from the present study suggests, at least for generalized mood disturbance, that patterns of intraindividual variability can emerge as important predictors of interindividual variability.

Research Question 2: Affective Structure Over Time

Factor analysis was used to assess the underlying structure of self-reported affect and to determine whether changes in the experience of affect could be described as qualitative or quantitative over time. It was hypothesized that three-factor structure of Love, Anger, and Sadness would best characterize the observed data, and that this structure would be invariant over time. No evidence was found for factorial invariance and, more specifically, a model specifying three independent factors (corresponding to the three emotional composites) at the Day_1 and Day_28 provided a weak fit to the data. Instead, the results revealed that the underlying covariance structure was characterized by three factors at Day_1 (Mixed, Anger, and Autonomy) and four factors at Day_28 (Love, Anger, Sadness, Autonomy). The emergence of Autonomy as an important post-dissolution construct was an unexpected finding. The Autonomy items were originally added to provide general coverage of the positive emotions individuals might feel when dissolving relationships. While participants certainly differed in the extent to which they reported feeling Relieved, Free, Strong, and Courageous, these four items covaried strongly throughout the diary measurement period. In fact, the findings revealed that this construct was the only one to demonstrate configural invariance (i.e., retain its factor structure over time). Thus, whether individuals reported few or many feelings of Autonomy, this factor remained strong, reliable, and stable throughout the diary measurement period.

With respect to Love, Anger, and Sadness, the results indicated that the patterns of item covariation changed between Day_1 and Day_28.[2] At entry into the study, participants reported a factor structure characterized by high loadings on both the Sadness and Love items. I called this a "Mixed" factor. On Day_1, when participants reported love and closeness they also tended to report sadness (and vice versa). One way of describing how love and sadness share common variance is that the Mixed factor captures and represents a dimension of grief we can think of as emotional confusion, or a pull toward a former partner based on both longing and sadness. When relationships end, individuals simultaneously experience love and sadness. As we might expect, when a person longs for their former partner and feels they would be miserable without them, they also report feeling sad, blue, lonely, and unhappy. Contrast this experience to what is observed a month later. At Day_28, the Love and Sadness items share a common variance with themselves but not with each other.

From these observations, speculations can be made about *how* people grieve. The findings suggest that participants undergo a qualitative reorganization in their experience of emotions. Their diary reports at Day_1 and Day_28 are not represented by mean or quantitative declines in the factors; instead, a more complex dynamic unfolds whereby participants reported a change in the way they experienced their emotions over time. In the general psychological literature this process is referred to as differentiation and is widely known to characterize many aspects of development (Carstensen, Pasupathoi, Mayr, & Nesselroade, 2000), especially the distinction between fluid and crystallized intelligence in

[2] Even for Anger, which was composed of a single factor at both occasions, a configurally invariant model at Day_28 provided a weak fit to the data. This result was due primarily to the Unhappy variable loading on only Sadness at Day_28 (rather than both Sadness and Anger as it did on Day_1).

the study of cognitive abilities (see McArdle, Ferrer-Caja, Hamagami, & Woodcock, 2002). To date, these kinds of empirical distinctions have not entered the bereavement literature, and there is no empirical precedent for distinguishing between qualitative vs. quantitative change in the nature of grief. The absence of such work is especially conspicuous because Bowlby's (1980) initial ideas on loss explicitly stated that cognitive-emotional *reorganization* was a key component in the process of successful mourning. The only multivariate approach suitable for capturing such reorganization is longitudinal factor analysis.

The results of the factor analyses also have implications for Emery's (1994) model, which specifies that individuals' experiences of love, anger, and sadness oscillate, dampen, and ultimately come into phase over time. While oscillation and dampening remain empirical possibilities, the evidence from the present study suggests that the process is not, as the model implies, wholly quantitative (i.e., invariant). In this sample, somewhere between Day_1 and Day_28 a change in item covariance takes place such that participants' emotional experiences of love and sadness are represented by two factors rather than one. When entering the study participants reported experiencing an emotional amalgamation of love and sadness; when leaving the study, the same participants reported this mixture of affect separated into single emotional constructs, each of which were experienced independently. To the extent that these results are generalizable to other affective experiences following stressful life events, the findings point to emotional reorganization as a fundamental aspect of the grief process.

Approaching post-relationship affect from a factor analysis perspective also raises a number of methodological points. In the bereavement literature, grief-specific measures are typically administered at multiple occasions (if the study is longitudinal) and participants are

assessed in relation to a clinical cut-off where they fall, broadly speaking, into a bereaved or non-bereaved group. Neimeyer and Hogan (2001), in their review of available bereavement measures, highlight the differences between quantitative and qualitative measures in assessing grief. In doing so, they fail to make an important distinction: Studying grief as a quantitative or qualitative process is very different than measuring grief using a quantitative or qualitative measures. Calling grief a qualitative experience because researchers used qualitative methods is incorrect. More troubling, however, is that much of the research in the bereavement literature is wed to an analysis of variance or mean change tradition (see any empirical chapter in Stroebe et al., 2001). If the grief experience or emotional reactions to loss do not operate as simple mean decline, these methods fail to capture the rich developmental processes unfolding over time.

These ideas are best illustrated with an example. The Stroebe et al. (2002) study mentioned earlier found no effects for a disclosure paradigm in reducing psychological stress among a large sample of bereaved widows. What if disclosing and writing about one's thoughts and feelings helped participants reorganize their emotions with respect to the loss experience? Instead of evidencing mean declines, the participants demonstrated a change in the underlying factor structure of depression and emotional intrusion. The analytic tools employed by Stroebe et al. (2002) were not suited to detect such changes. There is nothing inherently wrong with studying mean declines, and this critique should not be read as a condemnation of ANOVA. More generally, the central problem in the bereavement, grief, and coping literatures is that the proliferation of theory has greatly outpaced methodological applications. These ideas apply equally to the study of post-divorce adjustment and recovery from non-marital break-ups. Overall, then, the present study indicates that there are powerful

tools available for assessing more than mean change in the study of grief. In order to fully investigate elegantly reasoned theories of coping with loss, these tools should be exploited in the service of capturing important developmental processes**.**

Research Question 3: Growth Modeling

Shifting away from a focus on the underlying factor structure, the third group of analyses examined changes in the manifest diary composites. It was hypothesized that Love, Anger, and Sadness would evidence patterns of nonlinear decline while Autonomy would increase over time; that initiator status, length of relationship, attachment security, neuroticism, nonacceptance, generalized disturbance, and dissolution-related emotional intrusion would be significantly associated with the level and slope of the composites; and that diary reports of contact would have time-varying association with the emotional composites at each occasion of measurement.

To date, no published studies in the bereavement, divorce, or non-marital break-up literatures have attempted to examine changes in emotional reactions to loss via growth curve modeling, although this approach is frequently used in the longitudinal study of marital satisfaction (see Bradbury, 1998). Conceptually, the present study suggests that this is a useful endeavor that can potentially elucidate rates of recovery (or lack of recovery) over time and person-level predictors of how people experience their emotions following a loss event. In terms of univariate change, a series of increasingly complex growth models were fit for each of the four diary composites. For each composite, including a growth factor improved the model fit beyond an unconditional means model, indicating significant changes in each of the four constructs over time. This is notable given the relatively small level of mean change; for example, Anger declined an average of only 9 percentage points over the 1-

month study period (see Table C3 and Figure 2). The models indicate that these changes are best accounted for by an underlying growth trajectory that is more than measurement error in a stationary series.

In contrast to the hypothesis of nonlinear change, the Love composite declined in an entirely linear fashion with participants reporting an average decline of 2 percentage points on Love every four days. Over the course of the entire study period, participants declined an average of 12 points, which is approximately two-thirds of a standard deviation on the Love composite. For the Love model, there was no correlation between participants' start points and rates of decline. Consistent with the hypotheses, both Sadness and Anger evidenced patterns of nonlinear decline with uneven steps between measurement periods in growth factor basis. In addition, the best-fitting models for both of these negative affect composites included autoregressions from the previous manifest variables. For Sadness, the one-lag model indicated that, after accounting for the underlying growth trajectory, scores at the previous occasion were associated with increased rates of Sadness at the next occasion. For Anger, the model was more complex and consisted of a decline in the underlying growth trajectory followed by a sharp increase over the final two occasions. For this model, two lags were needed to capture the relations between the manifest variables, and, for some of the items, one lag was positively associated with Anger while the other was negatively associated. Autonomy also evidenced patterns of nonlinear change. However, in contrast to the completely latent basis models observed for Sadness and Anger, the rate of growth in Autonomy was quadratic, characterized by two different underlying growth trajectories. Given the large differences between participants' reports of Autonomy, the U-shaped function likely captures two different patterns of change. Many participants reported high

initial levels of autonomy that slowly dissipated over time. In contrast, participants who slowly accepted the loss began to feel more positive and thereby reported increases in Autonomy over time. Thus, the mean observations mask two patterns of change, and it would be incorrect to conclude that all participants evidenced curvilinear decreases in Autonomy followed by increases.

The primary implications of the univariate latent curve models are twofold. First, there is a great deal of complexity in the way these emotions change over time. The ALT specification, which combines the latent curve and simplex autoregression traditions (Curran & Hussong, 2002) and was implemented here for the negative affect composites, renders a straightforward interpretation of the slopes difficult. In the ALT models, predicting a score at any occasion is a combined function of a starting point, a constant rate, the basis of slope, the slope itself, the autogression between each manifest variable, and a score at the previous occasion (see equation 1, in Appendix B). If we consider just the slope and the autoregressions, we see that there is a large constant rate of decline for Sadness ($\mu\beta = -33.21$) but this underlying growth is being simultaneously offset by autoregressions serving to maintain high levels of Sadness. For Anger, there is a smaller slope ($\mu\beta = -6.39$) and the primary "push and pull" operates at the level of the manifest variables where the regression parameters are in opposite directions.

In addition to the complexity of the models, the findings clearly illustrate that all change is not created equally. This is the second implication of the univariate models: The composite emotions of Love, Anger, Sadness, and Autonomy change in very different ways in the first four to six weeks following a break-up. If one asks how long it takes to get over a break-up or how much change is observed every week, the answer depends largely on the

construct of interest. Few studies in the bereavement, divorce, or coping literatures have sought to delineate differential patterns of growth and change following stressful life events. However, these are important substantive issues and among the most frequent questions people ask when coping with a relationship transition-- "When will I people stop pining for my ex?" or, "How long does it take to start feeling less sad or angry?" In general, the answer to these questions is that rates of change or recovery are highly dependent on the outcomes of interest. A more refined (and perhaps interesting) answer also considers the influence of person-level covariates and whether individuals maintain contact with a former partner, both of which suggest that rates of change depend not only on the construct of interest but also on select individual difference variables. These factors are considered next.

Time-invariant covariates. There was mixed support for the hypothesis that initiator status, length of relationship, attachment security, neuroticism, nonacceptance, generalized disturbance, and dissolution-related emotional intrusion would be significantly related to the level and slope of the composites. Each of these covariates was associated with at least one of the composite levels or slopes. However, only a few of the covariates loaded on both the level and slope for multiple composites. Initiator status, for example, was associated with the Love level and slope but not significantly related to the other composite variables. (Participants reporting that their former partner initiated the separation reported high levels of Love and slower rates of linear decline.) In general, the covariates were more highly related to participants' start points than their rates of change, and there was evidence that individuals who reported greater break-up related distress at entry into the study and the follow-up also entered the study with higher levels of negative affect and lower levels of Autonomy.

Rather than detailing the implications of each significant relation between the covariates and the levels and slopes, I would like to focus on two findings in particular. First, compared to their less secure counterparts, participants who reported more attachment security entered the study reporting less Sadness, more Autonomy, and evidenced faster decreases in their reports of Sadness over time. Consistent with the cross-sectional findings, these results further support for the notion that attachment security is protective. Although the present findings say little about the nature of insecure attachment, participants who reported being able to trust others easily and feeling comfortable in intimate, close relationships evidenced faster declines in their rates of Sadness over time. A central issue in the attachment literature is concern over *attachment dynamics* or determining how different styles operate to confer or reduce risk (Fraley & Shaver, 1999; Shaver, 2001; Simpson & Rholes, 1998). One possible explanation for understanding how these dynamics unfold following relationship dissolution is that secure individuals have lower baseline levels of felt *insecurity* (see Simpson & Rholes, 1998). Secure individuals, then, are able to exact adaptive methods of coping because the stress of relationship dissolution does not overwhelm their capacity to experience negative affect. A more detailed focus on the psychological mechanisms secure individuals invoke to maintain high levels of felt security is needed to better understand how attachment security is protective.

Second, several dimensions of coping emerged as significant correlates of change. As observed in the cross-sectional correlations, self-blame continued to be related to Love, with participants reporting greater self-blame also entering the study with greater initial levels of Love and less Autonomy. In addition, problem-focused coping was associated with less Sadness at entry into the study, which is consistent with the idea that individuals who

accept the reality of a situation and enact concrete solutions typically report less distress (see Folkman & Lazarus, 1980). Given the significant correlation between problem-focused coping and dismissing attachment (see Appendix C, Table C1), it is plausible that the relation between problem-focused coping and Sadness represents a distancing strategy whereby individuals enact concrete and tangible coping efforts to distract themselves from the experience of negative affect. These behaviors are consistent with evidence indicating that dismissing individuals adopt an avoidant orientation as a way to maintain a defensive sense of self-reliance and independence (Bartholomew & Horowitz, 1991; Fraley & Shaver, 2000).

In addition to the significant relations among self-blame, problem-focused coping, and the composite growth models, a more unexpected finding concerned the support seeking variable. Participants who reported talking with someone about their feelings, getting advice, and accepting sympathy from others reported more Love and Sadness at entry into the study and slower rates of decline in Sadness compared to participants who reported engaging in less support seeking behavior. While conventional wisdom and almost all the literature on coping and bereavement-related grief purports that seeking social support in times of stress is adaptive (see Folkman, 2001), the present findings raise questions about this conclusion, at least with respect to the way young adults cope with the break-up of a romantic relationship. Because this study is based entirely on self-report and is purely correlation, it is difficult to disentangle whether participants experiencing the highest levels of sadness and longing seek out the most support or whether the experience of seeking support maintains or "stalls" declines in Sadness over time. With respect to the latter idea, seeking support may serve to induce dysphoric rumination. Instead of balancing loss- and restoration-oriented approaches to coping, constantly mulling-over one's psychological pain while reaching out to others may

inadvertently focus a person on how bad they feel and thereby exacerbate their distress. If these findings are replicated in additional research, both clinicians and clinical investigators may need to reconsider how they encourage people to cope with relationship transitions. From the present study, there is preliminary evidence that multiple forms of "extreme coping"-- be it emotional avoidance or ruminative support seeking-- are associated with maintained distress and slower rates of decline in negative affect over time.

Contact with a former partner: A time-varying covariate. Contact with a former partner can be a tricky and sometimes difficult experience. Divorced and divorcing adults frequently report that seeing their former partner at a social event or during child visitation exchanges can be very upsetting (Hetherington & Kelley, 2002). For some former partners, hostilities erupt immediately. For others, a cold shoulder and blank stare are more troubling. Beyond the stress of seeing the person, speaking with them on the phone, or exchanging emails, the question of "how much" looms large in people's minds following a break-up-- "My ex is begging to talk, will it be good for me?", "I really want and need to talk to her, should I call her?" or, "I saw him yesterday and now I am a wreck." Given the potential importance of contact as a covariate of individuals' post-relationship adjustment, it was hypothesized that diary reports of contact, which included any form of communication (e.g., phone, email or personal contact), would have time-varying influence on emotional composites within each occasion of measurement. The results partially supported this prediction. The models for Love, Sadness, and Autonomy were significantly improved upon by including regressions from the diary reports of contact to the occasion-specific emotional composite. There were no significant associations between Anger and contact at any of the occasions.

The small but significant regression parameters from contact to Love (at occasions 1, 3, and 4) indicate that in the first two weeks of the study period, the more individuals reported having contact with their former partner, the greater their associated reports of Love. In addition, because the models parameters are essentially correlations, the opposite interpretation is equally true: The greater participants' feelings Love at these occasions, the more contact they reported contact with their former partners. The same results held for Sadness at first two occasions (but not the last five). At the fourth occasion of measurement (i.e., Days 13 and 14), the path from contact to Autonomy was significant and positive. The direction of the relation between Autonomy and contact was surprising; it was expected that participants would report feeling less Autonomy after they had contact or when they reached out for contact.

There are two compelling ways to think about the results demonstrating that the change processes in Love and Sadness are slowed by contact with a former partner. Following any loss event individuals are charged not only with resolving their grief, but also with managing any perturbations to the normative adjustment process. For example, anniversaries and other reminders of a former partner can be very upsetting. Empirically, the introduction of random events, or shocks, are widely considered in the social sciences as disturbing events in both stationary and nonstationary time series (see Moskowitz & Hershbeger, 2002). In the process of dissolution, one of the clearest "shocks" to the emotional system is contact with a former partner, which can cause individuals to reevaluate their decisions to end the relationship or, if they are the left, re-experience the painful emotions of having the relationship ended against their wishes (Emery, 1994). The results of the present study confirm the notion that contact with a former partner has a significant

emotional sequelae, especially for individuals' reports of love and sadness in the first weeks after a separation.

In addition to the myriad ways contact may stall or disturb psychological adjustment, considering how problems of adjustment may lead to contact also sheds light on the observed findings. In a recent review of normative attachment theory, Diamond (2001) integrated a large amount of literature to suggest that the primary function of adult love relationships is emotion regulation. Like caregiver-infant attachment, there is clear evidence that adult attachment serves to buffer individuals against stress, induce calm, and down-regulate autonomic physiological arousal (Diamond, 2001; Feeney, 1995; Reite & Boccia, 1994, Sbarra & Hazan, 2002) and that this felt-security process operates even among disaffected couples (Kobak, Hazan, & Ruckdeschel, 1995). What happens when a relationship ends? I would like to propose the following: (a) Individuals become dysregulated by the removal of these functional components of the normative attachment system; (b) This separation distress is experienced as highly stressful; (c) As during any other time of stress, individuals seek to reduce their discomfort by searching for their primary emotion regulator, which in this case is their former partner; and (d) Contact with a former partner is stress reducing in the short-term (thus reinforcing continued contact), but also stress-provoking (as a result of continued hostilities, mismatches in wants and needs, resurfacing of old pain, etc.). On whole, this process creates a vicious cycle where individuals experiencing separation distress desire contact with their attachment figure, yet this person and the contact itself is stress inducing. While the data from the present study are limited with respect to their entirety of the proposed process, this model provides a useful foundation for better understanding the

dynamics of separation and contact, as well as how emotional dysregulation may spur individuals to seek contact with a former partner.

Research Question 4: Intraindividual Variation

How do individuals experience their emotions following when a relationship dissolves? Is there a common organization of affect across people? How do different emotions influence each other over time? The final group of analyses examined precisely these questions, and it was hypothesized, generally, that sub-groups of similarly varying participants would be identifiable through empirical methods and that dynamic factor models that included cross-loading parameters between emotion factors and items scores would lead to improved fits over less dynamic specifications. Both predictions were well supported by the data. Small but reliable sub-groups emerged through the iterative search procedure and the factor models revealed several interesting findings with respect to the bivariate patterning of daily affect.

Before turning to the findings in detail, it is worthwhile to revisit the rationale for implementing the dynamic modeling. Why put so much effort into empirically grouping people when doing so obviously limits the overall sample size and, some might argue, the subsequent generalizability of the results? Perhaps the best answer to these questions comes from what is observed by *not* approaching the data in this way. Consider, once again, the individual mean plots shown in Appendix D. One of the clearest patterns to emerge from the graphs is the vast differences in participants' reports of post-dissolution affect. Indeed, it appears that there are 58 *different* emotional "stories" unfolding within this sample. Given the obvious complexity of these within person patterns, aggregating the sample for analyses in order to make nomothetic generalizations without a scientifically defensible means of

doing so immediately renders such generalizations suspect (see Lamiell, 1981). Save generalizability, combining people and information this way makes little sense. Cross-sectional analyses, like those reported on earlier in this study, are known to yield undescriptive patterns of variation due to mathematical artifacts (Wood & Brown, 1994). There are many ways to address these types of problems (Nesselroade & Ghilsetta, in press). From a theoretical perspective, one way to move toward general lawfulness without sacrificing empirical rigor-- especially when focusing on developmental processes-- is a bottom-up approach that builds from the level of the individual to the group (Jones & Nesselroade, 1990, Nesselroade & Molenaar, 1999). It was in this spirit that the pooling and dynamic factor analyses were conducted in the present study.

Once participants with zero variance on the items of interest were dropped from the eligible sample, the iterative search process found between 6 to 11 participants for each of the bivariate DFAs (with a total sample size ranging from 167 to 296 observations). For this method of aggregation, sample sizes within the range of 6 to 11 participants are consistent with published reports using dynamic factor models. For example, in their study of cognitive abilities and physiology Nesselroade and Molenaar (1999) found that 10 of 30 participants could be classified as demonstrating "poolable" covariance matrices. Similarly, in a recent doctoral dissertation on the relation between borderline and narcissistic personality traits, Hurt's (2002) largest sub-group included 6 of 22 eligible participants. One implication of this approach is that, in the present study, the participants are as dissimilar as they look in their reports of daily affect. Whether this is a necessarily negative or an ultimately limiting finding depends largely on one's views regarding external and internal validity. On the one hand, sub-groups of 6 participants are troubling for the pursuit of lawfulness. On the other

hand, knowing that 165 observations are statistically poolable provides a strong basis for making reliable statements on the intraindividual dynamics of fewer participants (rather than making potentially erroneous assumptions about the operation of emotions in larger samples).

The chief aim of the DFAs was to examine the ways in which different emotions operated together over time. More precisely, these analyses focused on cross-factor loadings, or determining the ways conceptually related emotions covaried together. Five of the six bivariate models provided evidence for cross-factor loadings both within and across occasions. Across all the sub-group analyses, the Anger factor was particularly well-defined by its items over both lags, suggesting that the experience of Anger persists over the course of at least two days. This was not the case for all of the emotions; Love, Sadness, and Autonomy, while evidencing some patterns of lagged influence, were not as well defined by their items as the Anger factor (see the first two columns of Table 32). In addition to being well-defined, the Anger factor influenced both the Love and Sadness items. However, this pattern did not operate in reverse. The Love and Sadness factors did not influence reports on the Anger items. Taken together, theses findings provide preliminary evidence for the idea that Anger is the driving source in this emotional system. This interpretation is consistent with anger being a highly motivating and activating emotion (Izard & Ackerman, 2000) and one plays an important role in regulating interpersonal behaviors (see Oatley & Jenkins, 1996).

The dynamic analyses also revealed the importance of the interplay between Love and Sadness within occasions. Both "Seek out" and "Hard Without" (Love items) loaded positively on the Sadness factor at the concurrent occasion, and each of the Sadness items

loaded on the Love factor score. There was a high level of interdependence and covariation among the six items in this analysis, but each of these constructs were represented best as independent factors. Another way of saying this is that the simultaneous experience of Love and Sadness is, at least in the present study, among the *most systematic* emotional experiences reported by individuals who recently ended a relationship.

The interrelations among Love and Sadness with Autonomy also emerged as important components in these analyses. Participants reported their highest scores on the Free and Strong items when also reporting an absence of Love and Sadness (as indicated by the negative cross-loadings from Sadness to these items within occasion and from Love to the items across occasions). An important distinction to make here is that the absence of Autonomy is not driving other items; individuals in this sample are not feeling Sad because they lack feeling Free, Relieved or Strong. The opposite is true-- they report feeling Free and Strong when they do not feel sadness or a longing for their ex-partner. Although it may not be surprising that people feel Free and Strong when they are not pining for their ex-partner or feeling sad and lonely, these results point to subtle ways in which emotional experiences co-occur and shed light on the way individual emotions can drive emotional systems.

Limitations

Despite the relatively novel methods and prospective design used in this study, a number of limitations exist. All of the results emerged from self-reported outcomes with a single informant. Ideally, a more complete analysis of post-relationship emotion or grief would rely on both multiple informants and multiple methods. For example, the outcomes would likely differ if one's best friend reported on their psychological adjustment. Moreover, it is likely this area of study will be improved by also considering the many ways

individuals become physiologically dysregulated following a loss experience. Save a few studies in the divorce literature (Bane, Glaser, & Malarkey, in press), no work has moved in this direction.

An additional concern related to the accuracy of measurement is the potential method variance introduced by random daily sampling and the use of paper diaries. There are many different ways to collect experience sampling data, and no consensus exists with respect to the timing or frequency of sampling. In general, measurement depends on the constructs of interest (Csikszentmihalyi & Larson, 1992). However, a creative study by Stone et al. (2002) using photosensors for detecting when diaries are opened and closed demonstrated that high levels of non-compliance and hoarding behavior (i.e., completing several measurement occasions in one sitting) were common among participants using paper diaries. Because there is no way to tell how or to what degree the diary and beeper signal method introduced measurement error into the present investigation, the diary findings should be considered in light of the known limitations of this methodology. In order to minimize such bias, much of the experience sampling research is moving toward computerized assessment using handheld computers (Stone et al., 2002).

Beyond method variance, a major concern for interpreting the outcomes of this study is the extent to which recording one's daily emotions potentially influences, curtails, prolongs, or exacerbates the grief process. Given the noted effects of self-disclosure on adaptive psychological adjustment (Pennebaker, Kiecolt-Glaser, & Glaser, 1988) there is a high probability that completing the daily diary altered individuals' response patterns. Typically, this measurement issue is dealt with by including a re-test control group who are assessed at the beginning and end of a diary or repeated measures study but do not participate in the

repeated measures portion of the study (see Eizenman et al., 1997). With random assignment into either the control or diary condition, any differences between the two are directly attributable to the repeated assessments. No re-test control group was used for this investigation because of the "cost" of each participant. Despite the relative ubiquity of separation experiences, accumulating a large sample of individuals who recently ended a serious relationship is a definite challenge (see Gottman & Levenson, 1982 for a similar discussion of sampling divorced couples). Many of the participants who ultimately entered the Dissolution Study were followed over the course of two years while in an intact relationship, and, given the sample size demands of the structural analyses, relegating half the sample to a re-test control group seemed unwise for a first generation descriptive study of this nature.

Regarding the sample itself, there was the tremendous disparity in female and male participation. With only 10 men, conducting group comparisons by gender was impossible, let alone trying to specify more complex factor model comparisons. The disparity was not due to men reporting less break-up experiences than women. Many eligible male participants simply refused to participate, citing, qualitatively, not wanting to talk about the experience, not having time, or just "wanting to get over things and forget about it." Had this outcome been expected, it could have been measured and an empirical picture developed of the reasons men refused to participate. Without such data, we can only speculate that decisions not to participate are related to the ways in which men choose to cope with their emotions. Until these ideas can be tested empirically, there remains little prospective evidence on the differential coping strategies or emotional experiences between men and women following a break-up.

It also is important to keep in mind that the experience sampling employed here provides only a small window for viewing the separation experience. While investigating the first 28 - 42 days after a break-up experience has yielded preliminary clues about how people experience their emotions and grieve, this work says little about the ultimate patterns of successful or unsuccessful coping or the "best" or "worst" ways to grieve. For example, avoidant coping was associated with poor outcomes over time. Beyond a month, however, avoidance may become adaptive (e.g., see Bonanno et al., 1995), and this study does not address long-term adjustment. All of the results must therefore be interpreted within the timeframe of this study-- the first month of after a break-up. Extending the conclusions or implications of the results beyond this period is not warranted.

Several more specific methodological points also are noteworthy. For example, the use of the confirmatory factor models to study the structure of affect over time is not the most ideal method for assessing longitudinal factorial invariance. More appropriate use of current statistical methods would employ a longitudinal factor model specifying multiple factors at each occasion *within the same model* (Eizenman et al., 1997; McArdle & Nesselroade, 1994). This strategy was not adopted due to sample size concerns for the ultimate number of parameters needed to estimate complex longitudinal factor models. The cross-sectional sample was not large enough for these types of models. The confirmatory models should be interpreted with caution until more definitive conclusions can be drawn about the qualitative vs. quantitative nature of changes in emotional experience over time.

Another methodological point concerns multivariate statistical assumptions. Many of the diary variables evidenced considerable positive skew that was not correctable through square root or logarithmic transformations. Moreover, the multivariate statistical techniques

used in this study rely heavily on assumptions specific to large samples with known statistical distributions. For example, Maximum Likelihood Estimation procedures (like those used for the factor models and growth modeling) are not necessarily robust for non-normal, small sample data (Marsh & Hu, 1999). Given these concerns, it bears repeating that the findings should be considered preliminary and that further study in this area requires larger samples.

Finally, a more specific issue of concern surrounds the assessment of attachment. Participants completed the attachment measure (RSQ; Griffin & Bartholomew, 1994) on Day_1 at their intake interview, which ranged from one to thirteen days after the end of a relationship. Although self-report measures of attachment are designed to assess stable representations or working models of relationships, an obvious question is whether dimensions of attachment are reported differently when assessed immediately following a break-up experience. Suppose, for instance, a person typically reports a secure attachment style; however, two days ago, quite unexpectedly, their partner of two and a half years ended the relationship and admitted to being in love with someone else. How does this proximal experience impact this person reports feelings and beliefs about closeness, intimacy, and trust in close relationships? In their prospective study of 129 subjects in a dating relationship, Feeney and Noller (1992) reported a change in a forced-choice attachment classification for roughly 25% of their sample over 10 weeks, which is consistent with the published reports of test-retest reliability for the RSQ (Fraley et al., 2000). Thus, even when not assessed during times of relationship-specific stress, self-report patterns of attachment are known to vary. General variation notwithstanding, there are numerous reasons to believe the assessment of attachment in this study is potentially confounded with break-up specific distress, and the

attachment findings should be interpreted with caution. Future prospective studies focused on relationship dissolution can determine the extent to which self-reports are influenced by a recent break-up by assessing individuals prior to their separation and again when they end the relationship ends.

Future Directions

One of the more exciting aspects of this study is that it raises many more questions than it answers, and future work can move in a variety of directions. Perhaps the most pressing need is the study of separation or divorce that begins with intact relationships. Research of this nature is needed not only to study adjustment and coping prospectively, but also to investigate the separation dynamics that begin in intact relationships. Among the clearest cross-sectional findings from this study was that a large proportion of the sample reported high levels of Autonomy. One explanation for individuals feeling Free, Relieved, Courageous, and Strong is that the bulk of their grieving takes place while the relationship is still intact (see Emery, 1994; Vaughan, 1986). For individuals initiating the break-up, the actual physical separation may represent *the end of an adjustment process rather than the beginning*. Furthermore, it is quite possible that a passive withdrawal takes place among individuals who report being left by their partners, and even persons who report being left by their former partner may be psychologically removed from the relationship long before it ends. Regardless of the ultimate findings, these and similar hypotheses cannot be examined until the study of separation and divorce begins with the investigation of intact relationships.

This study purported to investigate the mechanisms of affective processing. While important change processes and interrelations among emotions were revealed, many process-level questions remain. For example, *how* does attachment security promote healthy adjust

following a break-up, and what specific strategies do secure individuals invoke to negotiate the transition out of a relationship? Similarly, how is avoidance deleterious? These questions need to be addressed before any kind of scientifically-informed interventions for separation or divorced adults can be proffered. Attachment security, for example, is known to be associated with adaptive self-regulation following stressful events and relationship dissolution, but how these processes operate is largely unknown (Feeney, 1995; Simpson & Rholes, 1998). One possibility is that secure individuals are better able to organize their cognitive-emotional experiences and psychologically narrate the separation experience in a way that is both psychologically and physiologically calming and stress-reducing. Creating narratives that counter the dysregulating aspects separation (e.g., "I'm OK, this pain is temporary." or, "I'll meet someone else; I'll fall in love again." or, "I just have to ride this out. I can make it through…") is one way in which meaning making schemes can be adaptive. These ideas need further study.

Finally, as indicated in several places throughout this report, the study of relationship dissolution will be greatly enhanced by incorporating physiological outcomes into research assessments. Diamond (2001) recently suggested that among the core properties of normative attachment is a physiological co-regulation serving to induce calm and buffer individuals against stress. From this perspective, many of the known psychological reactions to divorce or partner death can be viewed in terms of the removal of the functional components of the adult attachment system (Sbarra & Hazan, 2002). The emotional dysregulation the characterizes Emery's (1994) model of post-relationship grief likely extends to autonomic arousal and a heightened physiological stress response, both of which are associated with negative immune consequences (Kiecolt-Glaser et al., in press; Kiecolt-

Glaser, McGuire, Robles, & Glaser, 2002). New advances in quantitative methodology allow for examination of the ways in which emotional and physiological responses are coupled in the experience of grief (see Collins & Sayer, 2001). In order to fully investigate and ultimately understand how individuals recover from separation and loss, integrating the psychological and physiological is an important next step in this area of study.

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Appendix A: Measures*

Dating Study Weekly Email

Weekly Email

Date

Dear _____:

Thank you again for participating in our study of dating relationships. Please respond to the following questions.

1. At the initial interview, you indicated that you were dating a person with the initials of _____. Are you still dating this person?

____ YES

____ NO

____ I'm not sure. Things are up in the air right now.

2. Compared to last week, do you feel closer to your dating partner, more distant from them, or just about the same? _____.

3. How would you best describe the current state of your relationship? "X" as many as apply to your situation.

A. ___ I don't know about our future path yet, but this person makes me happy and things are going great right now.
B. ___ We're making great progress and I am falling in love with this person and/or we're in love.
C. ___ I am in love with this person, but things aren't going as well as before.
D. ___ I don't think I am in love with this person, but I am happy and content to be dating them right now.
E. ___ The relationship is solid, but we've hit some sort of plateau.
F. ___ I wish we could just "be friends."
G. ___ We're going downhill fast. We fight a lot. Even when we get along, it is not what it used to be.
H. ___ Although it is never easy to say, I think the end is near.

---

* Due to copyright restrictions, the Mood and Anxiety Symptom Questionnaire (MASQ; Watson & Clark, 1991) and the NEO-Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992) are omitted from this list of measures.

I. ___ It's psychologically over and I am "getting out" as soon as possible.
J. ___ We're breaking-up.
K. ___ Other (best described in some other way). Please comment:
_____

4. Please share with us any other information that you feel is important for understanding your current state with respect to this relationship. Feel free to write as much or as little as you would like:

Relationship Inventory

Demographic and Personality Questionnaire

INSTRUCTIONS: Please answer the following questions about yourself and your most recent dating relationship.

Name: _____ Age: _____ Sex: M or F

Date of Birth:_____

Year in school: _____

Racial/Ethnic Identification (circle one):

1. Asian/Asian American
2. Hispanic/Hispanic American
3. Native American
4. White/Non-Hispanic Caucasian
5. Black/African American

School Address: _____
_____
_____

Permanent Address: _____
_____
_____

Phone number(s): _____

Email address: _____

Please list one person who will always know how to reach you:

Name: _____

Relation to you: _____
Address: _____
Phone: _____

As you know, this study investigates how individuals cope with the end of a romantic relationship. Please tell us about your former partner and your relationship.

1. Person's name: _____.

2. Age: _____.

3. How long were you seeing this person (Please round to the nearest half month; e.g.. 1 year and 3 months or 4.5 months)? _____.

4. Please mark next to the number that **best** indicates who made the decision to end the relationship.

____ 1 = I was the initiator of separation/break-up (My partner would not have ended the relationship at this time.)

____ 2 = He/she was the initiator of the separation/break-up. (I would not have ended the relationship at this time.)

____ 3 = The break-up was based on a mutual decision to separate. (We had equal input into the decision to end the relationship.)

5. On the following scale, please circle the number that best indicates who chose to end the relationship.

I chose to make the break 1 2 3 4 5 6 7 He/she chose to make the break and to end the relationship and to end the relationship

6. In you opinion, why did this relationship end? Please describe briefly what led to the end of this relationship. Please include as many or as few details as comfortable for you.

_____
_____
_____

Acceptance of Relationship Termination (ART) Scale

Directions: Please answer some questions concerning your feeling about the end of your relationship with _____.

	Not at all my feelings	Slightly	Somewhat	Very much my feelings
1. I find myself spending a lot of time thinking about my former partner.	1	2	3	4
2. Sometime I just can't believe that we separated/broke-up.	1	2	3	4
3. I find myself wondering what my former partner is doing.	1	2	3	4
4. I feel that I will never get over this separation/break-up.	1	2	3	4
5. I went ahead with the separation/break-up only because it was what my partner wanted.	1	2	3	4
6. I feel as if I was dumped.	1	2	3	4
7. Perhaps, all things considered, we should have tried longer.	1	2	3	4
8. I feel as if this was a horrible mistake.	1	2	3	4
9. Breaking up or ending a romantic relationship is one of the most difficult things that can happen to someone.	1	2	3	4
10. This separation was coming for a long time and I am glad we finally made the break.	1	2	3	4
11. It isn't an easy decision to separate from your partner, but basically I am relieved.	1	2	3	4

Impact of Events Scale (IES)

On _____, you indicated that you ended your relationship with _____.

Below is a list of comments made by people after stressful events. Please check each item, indicating how frequently these comments were true for you DURING THE PAST SEVEN DAYS. If the did not occur during that time, please mark the "not at all" column.

	Not at all	Rarely	Sometimes	Often
1. I thought about it when I didn't mean to.				
2. I avoided letting myself get upset when I thought about it or was reminded of it.				
3. I tried to remove it from memory.				
4. I had trouble falling asleep or staying asleep because pictures about it that came into my mind.				
5. I had waves of strong feelings about it.				
6. I had dreams about it.				
7. I stayed away from reminders of it.				
8. I felt as if it hadn't happened or wasn't real.				
9. I tried not to talk about it.				
10. Pictures about it popped into my mind.				
11. Other things kept making me thinking about it.				
12. I was aware that I still had a lot of feelings about it, but I didn't deal with them.				
13. I tried not to think about it.				
14. Any reminder brought back feelings about it.				
15. My feelings about it were kind of numb.				

Revised Ways of Coping Checklist (RWCCL)

On _____ you indicated you ended your relationship with _____.

The items below represent ways that you may have dealt with the event listed above. We are interested in the degree to which you have used each of the following thoughts/behaviors in order to deal with this problem. Please check the appropriate column if the thought/behavior was: never used, rarely used, sometimes used, or regularly used (at least 4 to 5 times per week).

0 = Never Used; 1= Rarely Used; 2 = Sometimes Used; 3 = Regularly Used

THOUGHTS/BEHAVIORS	**0**	**1**	**2**	**3**
1. Bargained or compromised to get something positive from situation.				
2. Counted my blessings.				
3. Blamed myself.				
4. Concentrated on something good that could come out of whole thing.				
5. Kept my feelings to myself.				
6. Figured out whom to blame.				
7. Hoped a miracle would happen.				
8. Asked someone I respected for advice and followed it.				
9. Prayed about it.				
10. Talked to someone about how I was feeling.				
11. Stood my ground and fought for what I wanted.				
12. Refused to believe that it had happened.				
13. Criticized or lectured myself.				
14. Took it out on others.				
15. Came up with a couple of different solutions to my problem.				
16. Wished I were a stronger person—more optimistic and forceful.				
17. Accepted my strong feelings, but didn't let them interfere with				
other things too much.				
18. Focused on the good things in my life.				
19. Wished that I could change the way that I felt.				
20. Changed something about myself so that I could deal with the situation better.				
21. Accepted sympathy and understanding from someone.				
22. Got mad at the people or things that caused the problem.				
23. Slept more than usual.				
24. Spoke to my clergyman about it.				
25. Realized I brought the problem on myself.				

0 = Never Used; 1 = Rarely Used; 2 = Sometimes Used; 3 = Regularly Used

THOUGHTS/BEHAVIORS cont.	0	1	2	3
26. Felt bad that I couldn't avoid the problem.				
27. I knew what had to be done, so I doubled my efforts and tried harder to make things work.				
28. Thought that others were unfair to me.				
29. Daydreamed or imagined a better time or place than the one I was in.				
30. Tried to forget the whole thing.				
31. Got professional help and did what they recommended.				
32. Changed or grew as a person in a good way.				
33. Blamed others.				
34. Went on as if nothing had happened.				
35. Accepted the next best thing to what I wanted.				
36. Told myself things could be worse.				
37. Talked to someone who could do something concrete about the problem.				
38. Tried to make myself feel better by eating, drinking, smoking, taking medications, etc.				
39. Tried not to act too hastily or follow my own hunch.				
40. Changed something so things would turn out right.				
41. Avoided being with people in general.				
42. Thought how much better off I am than others.				
43. Had fantasies or wishes about how things might turn out.				
44. Just took things one step at a time.				
45. Wished the situation would go away or somehow be finished.				
46. Kept others from knowing how bad things were.				
47. Found out what other person was responsible.				
48. Thought about fantastic or unreal things (like the perfect revenge				
or finding a million dollars).				
49. Came out of the experience better than when I went in.				
50. Told myself how much I have already accomplished.				
51. Wished that I could change what had happened.				
52. Made a plan of action and followed it.				
53. Talked to someone to find out about the situation.				
54. Avoided my problem.				
55. Relied on faith to get me through.				
56. Compared myself to others who are less fortunate.				
57. Tried not to burn my bridges behind me, but left things open somewhat.				

Daily Diary (Enlarged)

Time signaled: _____.
Time rated: _____.
Date: _____.

Have you had any contact with your former partner since you last rated yourself?

__ No ___ Yes

If yes, please check all that apply:

____ Positive and/or friendly contact
____Negative contact.
____Romantic Contact

Are you thinking about getting/hoping to get back together with this person?

___Yes ___No ___Maybe (I'm not sure) ___We are back together

Based on how you are feeling when signaled, please rate yourself 9-point scale with respect to our former partner:

I strongly disagree 1 2 3 4 5 6 7 8 9 I strongly agree

1.I feel I can confide in _____ about virtually everything. **Rating: _____**
2.I would do almost anything for _____. **Rating: _____**
3.If I could never be with _____, I would be miserable. **Rating: _____**
4.If I were lonely, my first thought would be to seek _____ out. **Rating: _____**
5.One of my primary concerns is _____'s welfare. **Rating: _____**
6.I would forgive _____ for practically anything. **Rating: _____**
7.I feel responsible for _____'s well-being. **Rating: _____**
8.I would greatly enjoy being confided in by _____. **Rating: _____**
9.It would be hard for me to get along without _____. **Rating: _____**

Below is a list of words that describe feeling people have. For each word, please check the box that best describes how you are feeling with respect to your former partner when signaled.

	Not At All	A Little	Moderately	Quite a Bit	Extremely
Angry					
Unhappy					
Sorry for things done					
Peeved					
Sad					
Grouchy					
Blue					
Unworthy					
Spiteful					
Annoyed					
Discouraged					
Resentful					
Lonely					
Helpless					
Furious					
Bad-tempered					
Deceived					
Worthless					
Guilty					
Terrified					
Hopeless					
Relieved					
Free					
Courageous					
Strong					

Based on how you were feeling WHEN YOU FIRST BROKE UP, how do you think you're feeling about the end of the relationship TODAY?

____Better (I am feeling like I am handling thing a little better.)
____The same.
____Worse (I am not doing as well handling the end of this relationship.)

Please tell us anything else you think is important about how you're coping with the end of this relationship:

_____
_____
_____

Appendix B: Data Analysis Details

In keeping with main research questions and of this study, the results are reported four main sections: (a) Descriptive Analyses and Mental Health Outcomes; (b) Affective Structure Over Time; (c) Analysis of Change: Growth Modeling; and (d) Intraindividual Variation. The first section of the *Results* reports on the correlations between the covariates and both sets of outcome variables (i.e., non-diary and diary measures). To determine the extent to which the dissolution of a relationship is associated with dysregulation of daily emotion, mean comparisons were conducted between the dating sample and the dissolution sample for self-reported diary items and daily variability in these items. In addition, a brief portion of the first section is dedicated to more qualitative observations of daily reports of Love, Sadness, Anger, and Autonomy. These observations are reported in conjunction with individual plots of the diary composites and intraindividual Z-score plots (both of which are shown in Appendix D for each person). Finally, a series of hierarchical regressions were conducted to predict non-diary outcomes at Day_28. Three blocks of independent variables were entered into the models in the following progression: (a) The covariates of attachment security, and coping self-blame and avoidance; (b) Mean reports of daily affect on the four diary composites; and (c) Mean standard deviations in the four composites.

The second section of the Results focuses on the structure of daily affect through factor analysis and determining whether changes in post-dissolution emotions are quantitative or qualitative in nature. For these analyses, careful attention was paid to parameter estimates. Given the small sample size and relatively large number of diary items, 17 of the 33 diary items were selected for these analyses to limit the number of estimated

model parameters (for suggestions on item selection in small sample research, see Marsh & Hau, 1999). First, exploratory factor analysis (EFA) was conducted at Day_1 to determine the structure of the diary items at entry into the study. A series of nested confirmatory factor models (CFAs) were then fit to the diary items at Day_28. Specifically, these models evaluated whether the Day_1 structure and loading pattern fit the data at Day_28. The parameters and loadings from the Day_1 model thus become the starting point for the first model at Day_28. A metrically invariant parameterization specified that the items load on the factors in precisely the same way over time and that the same factor structure is retained (see McArdle & Nesselroade, 1994). In contrast, a configurally invariant model only requires that the factor structure remains stable; the item loadings are not required to be the same over time. After these confirmatory analyses, EFA was conducted at Day_28 to determine if varying the structure and allowing for qualitative change improved the overall fit to the data. The model fit was evaluated by examining the comparative fit index (CFI; Bentler, 1989), root mean square error of approximation (RMSEA; Browne & Cudeck, 1993), and change in chi-square for change in degrees of freedom (which is chi-square distributed) when the models were nested. The CFI ranges from 0 – 1, with values above .93 indicating a good fit. RMSEA measures the degree of model misfit, with values .07 or less indicative of a good fitting model and .10 or larger reflecting a poor fitting model.

The third section of the Results focused on latent curve growth modeling (LGM), a general approach for analyzing trends (both upward and downward) in data (McArdle & Epstein, 1987; Willett & Sayer, 1994). These procedures are commonly referred to as multilevel or random effects models and they can be examined from structural or linear model perspectives (see Bryk & Raudenbush, 1992). The strength of LGM is that it allows

for the description of both group change and individual change over time, and these trends can be estimated with relatively small sample sizes (Curran and Bollen, 2002; Hussong et al., 2001**;** McArdle & Anderson, 1990). The LGM is equivalent to a two factor covariance-based model except that the level and slope factors are assumed to have means (i.e., a mean level and a mean slope) that represent group change as well as deviations around these means (i.e., a deviation around the level and a deviation around the slopes) that represent stochastic individual differences around group means. Together, these parameters describe the average starting point across the sample, the average rate of range across the same, the average deviation from the starting level, and the average deviation around the rate of change. RMSEA and the normed fit index (NFI) were used to assess model fit. The NFI yields a descriptive score ranging from 0 – 1, with values of greater than .90 indicative of a good-fitting model (Bentler & Bonett, 1980). For the present analyses, only 14 of the 28 occasions of measurement were used; these 14 observations were combined such that the final models included 7 occasions of measurement, each of which was the average score of two contiguous days spaced four days apart (e.g., average of Day_1 & Day_2 = Occasion 1; average of Day_5 & Day_6 = Occasion 2, …. average of Day_24 & Day_25 = Occasion 7). This strategy was adopted because standard growth models frequently fail due to excessive power when including a large number of occasions (Curran, personal communication).

Because it was hypothesized that individual levels of Love, Sadness, Anger, and Autonomy would decline over time, the first series of models examined how this process operated and whether curve changes were best characterized by linear, quadratic, flat, or stopped (i.e., curving then leveling-off) trajectories. In addition to the standard LGMs, additional parameters were added to evaluate an autoregressive latent trajectory (ALT) model

(Curran & Bollen, 2001, 2002). The ALT model simultaneously allows for the estimation of underlying growth trajectories while incorporating autoregressive parameters to capture the lagged influence of a variable on itself over time. In other words, how do scores at the previous occasion of measurement influence a given observation when *controlling for* the underlying latent trajectory? Consider the following equation

$$y_{it} = \alpha_i + \Lambda_{t2}\beta_i + \rho_{t,t-1}y_{i,t-1} + \varepsilon_{it} \qquad (1)$$

where $y_{it} = \alpha_i + \Lambda_{t2}\beta_i + \varepsilon_{it}$ represents that standard latent growth model with an initial level (α_i), a rate of change defined by the factor loading basis (Λ_{t2}) and slope (β_i), and error of measurement (ε_{it}), as well as an autoregressive parameter in which y_{it} score is influenced by a lagged regression parameter from the previous occasion of measurement, $\rho_{t,t-1}y_{i,t-1}$. The formulaic details of this analysis are important for understanding the slopes and rates of change in the section on growth. Specifically, note that a given score, y_{it}, is the product not only of the LGM parameters, but also the previous regression coefficient and score from the previous occasion. In some cases, this makes a straightforward interpretation of the slope estimate difficult because it operates in concert with the autoregressive parameter to predict each successive score.

After determining the best-fitting univariate growth models, two sets of additional analyses were conducted that focused on the role of covariates. First, person-level background variables were added to the univariate growth models to determine whether individual differences predicted the initial level and slopes within the growth model. These practices are common in LGM and involve adding individual difference components or groups to a Level-2 equation (Bryk & Raudenbush, 1992, especially Chapter 6; Hussong et. al., 2001; MacCullum, Kim, Malarkey, Kiecolt-Glaser, 1997). Second, the influence of a

time the time-varying covariate of daily contact (with a former partner) was evaluated to determine if diary reports of contact were significantly associated with daily reports of affect (see Curran & Bollen, 2002). This analysis was conducted by regressing the diary reports of affect directly on the contact variable within the same occasion. Contact was recoded on a 3-point continuous basis (scores of 0, 1, 2, reflected no contact, contact on one of the two days, and contact on both days within the occasion of measurement, respectively; recall that each of the 7 occasions is the average of two contiguous days).

The fourth and final section of the results focuses on intraindividual variation by finding empirically "poolable" subgroups of participants and then conducting a series of bivariate Dynamic Factor Analyses (DFAs) using the four emotional composites. DFA is a relatively novel extension P-technique factor analysis for modeling intraindividual variability over time for a single individual (Molenaar, 1985). The merit of this approach rests in the ability to allow researchers to study the dimensionality of the factor solution and the extent to which lead and lagged (i.e., non-contemporaneous) relations exist in the latent or observed variables while overcoming the main criticism of serial autocorrelation in P-technique (Wood & Brown, 1994). Recent advances in DFA allow for the pooling of time series data to estimate a lagged covariance matrix representing a longer series of observations on an "aggregate" individual, thus making DFA making more accessible to studies with fewer occasions of measurement (Nesselroade & Molenaar, 1999). The key feature of this methodology is that it defines a way to decide which individuals' information may effectively be pooled without destroying the integrity of each person's pattern of change.

For the present study, the first step in conducting the DFAs is finding poolable sub-groups of participants. This procedure consisted of constructing a block-Toeplitz matrix for

each participant according to the strategy outlined by Nesselroade and Molenaar (1999). The matrix consists of "stacked" covariance matrices, one triangular matrix for the covariances at lag 0 (the concurrent covariances, which are symmetrical) and square non-symmetrical matrices for covariances at each of the successive lags (the lagged relations are non-symmetrical because lagged correlation of r_{xy} is not the equivalent of r_{yx}). Once created, the individual block-Toeplitz matrices are submitted to an iterative search procedure designed to group people according to similarity in the lagged covariance matrices. Dissimilar participants are repeatedly rejected until a homogenous group is identified. Once identified, the covariance matrices of each member of the group are pooled into a single "super" matrix, which is similar to concatenating the data.[14] This matrix is used as the input matrix for the DFA analyses.

The primary focus of DFA is to understand time-based relations among variables within a multivariate factor model framework (Wood & Brown, 1994). In order to study the bivariate emotional dynamics of intraindividual variation in the present study, six DFAs were conducted representing the pairing of each of the four main diary composites (i.e., Love and Sadness, Love and Anger, Love and Autonomy, Sadness and Anger, Sadness and Autonomy, Anger and Autonomy). Figure B1 illustrates the basic features of the Molenaar (1995) DFA specification over three lags (i.e., lag0, lag1, lag2). Lag 0 always refers to the covariance at the current occasion of measurement. As shown, the item scores at any occasion are influenced not only by their factor at that occasion, but also the factors at the previous two occasions. This model is only one of many possible specifications. For example, an alternative hypothesis is that item scores today are influenced not only by their factor today

[14] The iterative search procedure is conducted using a series of FORTRAN programs (written by J.R. Nesselroade at the University of Virginia) executable in the Unix work environment.

but a separate, independent factor. This pattern would be called a cross-loading and these types of relations are of particular interest in the present study. For instance, one's Anger items today may be influenced by today's Anger factor, as well as yesterday's Love factor (e.g., "I hate you today because I loved you yesterday"). Bivariate DFAs thus allow for an investigation of the way different emotions influence each other over time.

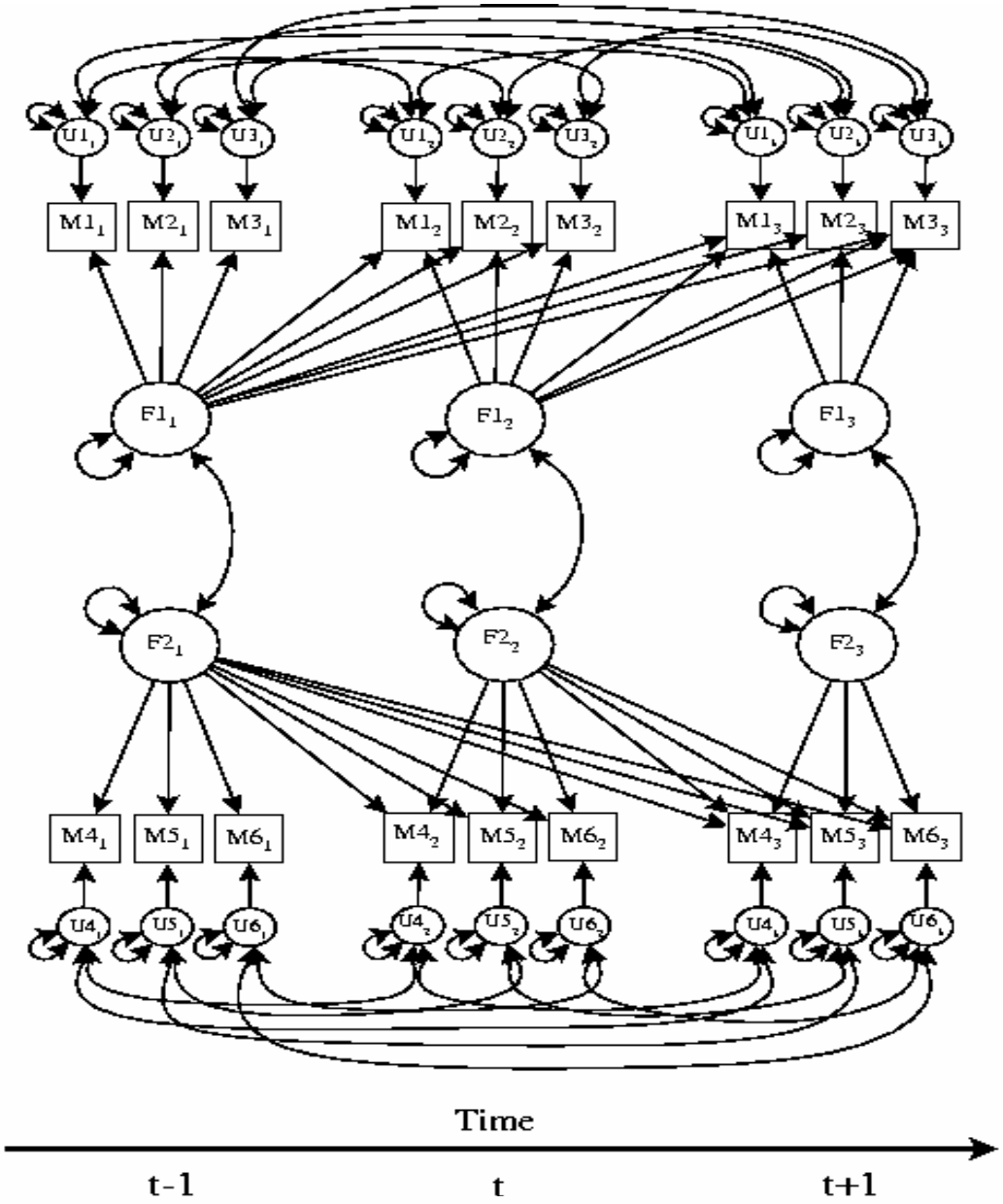


Figure B1. Path diagram for Molenaar's (1995) specification of the dynamic factor model over two lags.

Appendix C: Descriptive Tables

Table C1

Bivariate Correlations Among Covariates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) RSQ, Secure	1																	
(2) RSQ, Fearful	-.63**	1																
(3) RSQ, Preoccupied	-.20	-.02	1															
(4) RSQ, Dismissing	-.14	.38*	-.44**	1														
(5) RWCCL, Problem Focused	.11	.22	-.12	.40**	1													
(6) RWCCL, Support Seeking	.04	-.14	.19	-.09	.04	1												
(7) RWCCL, Blames Self	-.34*	.10	.28*	-.22	-.16	-.10	1											
(8) RWCCL, Avoidance	-.43*	.29	.16	.13	.17	-.05	.38*	1										
(9) NEO, Neuroticism	-.34*	.19	.22	-.18	-.19	.14	.38*	.24	1									
(10) NEO, Extraversion	-.19	.19	.27	.11	.26	.01	.21	.21	.06	1								
(11) NEO, Openness	.03	.03	-.10	-.05	.10	-.01	-.03	-.09	-.03	-.07	1							
(12) NEO, Agreeableness	-.16	.15	.01	.16	-.11	.02	.16	.10	.34*	.15	-.20	1						
(13) NEO, Conscientiousness	.17	-.02	-.14	.41**	.34*	.01	-.07	-.20	-.34*	.13	.13	-.09	1					

Table C1 (cont)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(14) IES_T1, Avoidance	-.16	.19	-.06	.15	.24	-.11	.14	.55**	-.10	.20	-.06	.11	.10	1				
(15) IES_T2, Avoidance	-.27	.16	.25	-.17	-.09	.02	.33*	.41*	-.03	.18	-.12	-.04	-.09	.39*	1			
(16) Length	-.09	-.27	.09	-.09	-.21	-.07	.15	.08	.06	.12	.08	-.08	.09	.19	.22	1		
(17) Initiator Status	-.31*	.34*	-.04	-.18	-.16	.00	.11	.12	.10	.03	.09	.24**	-.17	.05	.31*	-.10	1	
(18) Gender	-.29*	.16	.10	.17	.23	.07	.05	.26*	.01	-.20	-.03	-.14	.04	.12	.22	.05	-.02	1
Means	**3.46**	**2.69**	**3.12**	**3.15**	**1.52**	**1.53**	**1.20**	**1.02**	**33.00**	**37.05**	**36.00**	**37.00**	**41.76**	**12.51**	**9.94**	**21.56**	**3.08**	**1.83**
Standard Deviations	**.62**	**.95**	**.78**	**.64**	**.48**	**.81**	**.83**	**.49**	**4.12**	**3.12**	**3.06**	**4.41**	**3.18**	**5.18**	**6.28**	**18.18**	**1.95**	**.38**

Note. RSQ = Relationship Styles Questionnaire; RWCCL = Revised Ways of Coping Checklist; NEO = NEO-FFI Personality Inventory. Initiator status ranges from 1 – 7 with higher values indicating the participant felt left by their former partner.
* = $p < .05$; ** = $p < .01$

Table C2

Mean Scores, Standard Deviations, and Paired-Sample t Statistics for Each Diary Item at Days 1 and 28

Emotion	Day_1	Day_28	*t* -value
Miserable without him/her	3.70 (2.37)	3.33 (2.33)	.71
I can confide in him/her	5.78 (2.21)	4.45 (2.62)	3.63**
Enjoy being confided by him/her	7.05 (2.08)	5.47 (2.80)	4.70**
Lonely seek him/her out	5.13 (2.51)	3.54 (2.47)	4.86**
Forgive him/her for practically anything	5.01 (2.41)	4.40 (2.82)	2.15*
Primary concern is his/her welfare	6.29 (1.92)	4.27 (2.45)	6.78**
Do almost anything for him/her	5.63 (2.16)	4.53 (2.76)	4.30**
Responsible for his/her well-being	4.48 (2.03)	3.65 (2.35)	2.69*
Hard without him/her	4.03 (2.32)	3.46 (2.32)	2.14*
Angry	1.91 (1.01)	1.36 (.82)	3.84**
Unhappy	2.43 (1.11)	1.63 (.94)	4.74**
Sorry for things done	2.37 (1.18)	1.76 (1.10)	3.62**
Peeved	2.10 (1.25)	1.38 (.93)	3.70*
Sad	2.70 (.96)	1.64 (.93)	6.76*
Grouchy	1.74 (1.02)	1.21 (.68)	3.72*
Blue	2.05 (1.03)	1.43 (.74)	4.31**
Hopeless	1.50 (.84)	1.20 (.44)	2.90*
Unworthy	1.43 (.81)	1.22 (.77)	1.19
Spiteful	1.58 (1.04)	1.34 (.82)	1.67
Annoyed	2.25 (1.30)	1.49 (.90)	4.65**
Discouraged	1.89 (1.037)	1.152 (.92)	2.83**
Resentful	1.67 (.98)	1.30 (.74)	2.47*
Lonely	2.50 (1.30)	1.74 (1.12)	4.00**
Helpless	1.50 (.84)	1.34 (.92)	1.01
Furious	1.50 (.80)	1.20 (.73)	2.25**
Bad-Tempered	1.43 (.81)	1.20 (.73)	1.75
Deceived	1.58 (.97)	1.27 (.62)	2.54**
Worthless	1.36 (.83)	1.16 (.53)	1.76
Guilty	1.91 (1.22)	1.70 (1.27)	1.28
Relieved	2.39 (1.13)	2.40 (1.44)	.08
Free	2.75 (1.23)	2.61 (1.36)	.67
Courageous	2.17 (1.02)	2.23 (1.29)	-.30
Strong	2.77 (1.12)	2.45 (1.34)	1.83

Note. Standard deviations are in parentheses. The Love items (first nine items, from "Miserable without" to "Hard without") range from 1-9, with 1 being "Strongly Disagree" and 9 being "Strongly Agree." The remainder of items ranged from 1-5, with 1 being "Not At All" and 5 being "Extremely." * = $p < .05$; ** = $p < .01$

Table C3

Weekly Means and Standard Deviations for the Four Composite Diary Scales

Emotion_Day	Mean	Standard Deviation
Love		
Love_1	.57	.16
Love_7	.52	.19
Love_14	.49	.20
Love_21	.45	.23
Love_28	.45	.23
Sadness		
Sad_1	.46	.16
Sad_7	.37	.18
Sad_14	.32	.15
Sad_21	.32	.16
Sad_28	.31	.15
Anger		
Anger_1	.35	.15
Anger_7	.28	.15
Anger_14	.24	.08
Anger_21	.25	.10
Anger_28	.26	.13
Autonomy		
Aut_1	.50	.18
Aut_7	.44	.20
Aut_14	.44	.22
Aut_21	.43	.21
Aut_28	.48	.24

Note. To facilitate comparisons across scales, scores were transformed to represent percentages of the total possible on that measure. Because the Love composite is computed on a 9-point scale, the scores range from .11- 1. Each of the other three scales range from .20 – 1.

Table C4

Summary Statistics for Diary Items Selected for Factor Analysis

Emotion	Day_1	Day_28
Miserable without him/her	3.70 (2.37)	3.33 (2.33)
Enjoy being confided by him/her	7.05 (2.08)	5.47 (2.80)
Lonely seek him/her out	5.13 (2.51)	3.54 (2.47)
Hard without him/her	4.03 (2.32)	3.46 (2.32)
Angry	1.91 (1.01)	1.36 (.82)
Unhappy	2.43 (1.11)	1.63 (.94)
Peeved	2.10 (1.25)	1.38 (.93)
Sad	2.70 (.96)	1.64 (.93)
Blue	2.05 (1.03)	1.43 (.74)
Annoyed	2.25 (1.30)	1.49 (.90)
Discouraged	1.89 (1.04)	1.15 (.92)
Lonely	2.50 (1.30)	1.74 (1.12)
Bad-Tempered	1.43 (.81)	1.20 (.73)
Relieved	2.39 (1.13)	2.40 (1.44)
Free	2.75 (1.23)	2.61 (1.36)
Courageous	2.17 (1.02)	2.23 (1.29)
Strong	2.77 (1.12)	2.45 (1.34)

Note. Standard deviations are in parentheses. The Love items (first nine items, from "Miserable without" to "Hard without") range from 1-9, with 1 being "Strongly Disagree" and 9 being "Strongly Agree." The remainder of items ranged from 1-5, with 1 being "Not At All" and 5 being "Extremely."

Table C5

Alternative Model Fit Statistics for Latent Curve Models of Love Over Time

	Model 1: Latent Means	Model 2: Latent Linear Growth	Model 3: Latent Growth	Model 4: Linear Growth, Correlated Errors	Model 5: Linear Growth, ALT	Model 6: Linear Growth, Partially Correlated Errors
$\chi 2$	254	108.23	104.55	49.00	79.02	49.77
df	32	29	24	23	29	26
Parms	3	6	11	12	12	9
CFI	.65	.87	.87	.96	.91	.96
RMSEA (90% CI)	.35 (.31, .39)	.21 (.17, .26)	.24 (.19, .29)	.14 (.08, .19)	.21 (.16, .26)	.12 (.07, .17)

Note. df = degrees of freedom; Parms = parameters estimated in model;
CFI = Comparative Fit Index; RMSEA = root mean squared error of approximation.

Table C6

Alternative Model Fit Statistics for Latent Curve Models of Sadness Over Time

	Model 1: Latent Means	Model 2: Latent Linear Growth	Model 3: Latent Growth	Model 4: Latent Growth, Correlated Errors	Model 5: Latent Growth, ALT
$\chi 2$	212	114.94	96.149	69.53	36.02
df	32	29	24	18	18
Parms	3	6	11	17	17
CFI	.51	.76	.88	.86	.95
RMSEA (90% CI)	.31 (.28, .36)	.23 (.18, .27)	.23 (.18, .28)	.22 (.17, .28)	.13 (.07, .19)

Note. df = degrees of freedom; Parms = parameters estimated in model;
CFI = Comparative Fit Index; RMSEA = root mean squared error of approximation.

Table C7

Alternative Model Fit Statistics for Latent Curve Models of Anger Over Time

	Model 1: Latent means	Model 2: Latent Linear Growth	Model 3: Latent Growth	Model 4: Latent growth, with lagged autoregressions
$\chi 2$	201	169.52	115.15	36.194
df	32	29	24	17
Parms	3	6	11	18
CFI	.31	.45	.62	.92
RMSEA (90% CI)	.30 (.27, .36)	.29 (.24, .33)	.26 (.21, .32)	.14 (.07, .20)

Note. df = degrees of freedom; Parms = parameters estimated in model;
CFI = Comparative Fit Index; RMSEA = root mean squared error of approximation.

Table C8

Alternative Model Fit Statistics for Latent Curve Models of Autonomy Over Time

	Model 1: Latent means	Model 2: Latent linear Growth	Model 3: Latent Growth	Model 4: Latent Growth, ALT	Model 5: Linear and Quadratic Growth
$\chi 2$	124.32	62.30	86.62	69.53	35.86
Df	32	29	24	18	25
Parms	3	6	11	17	10
CFI	.79	.92	.86	.86	.98
RMSEA (90% CI)	.22 (.19, .29)	.14 (.09, .19)	.21 (.17, .27)	.22 (.17, .28)	.07 (.00, .14)

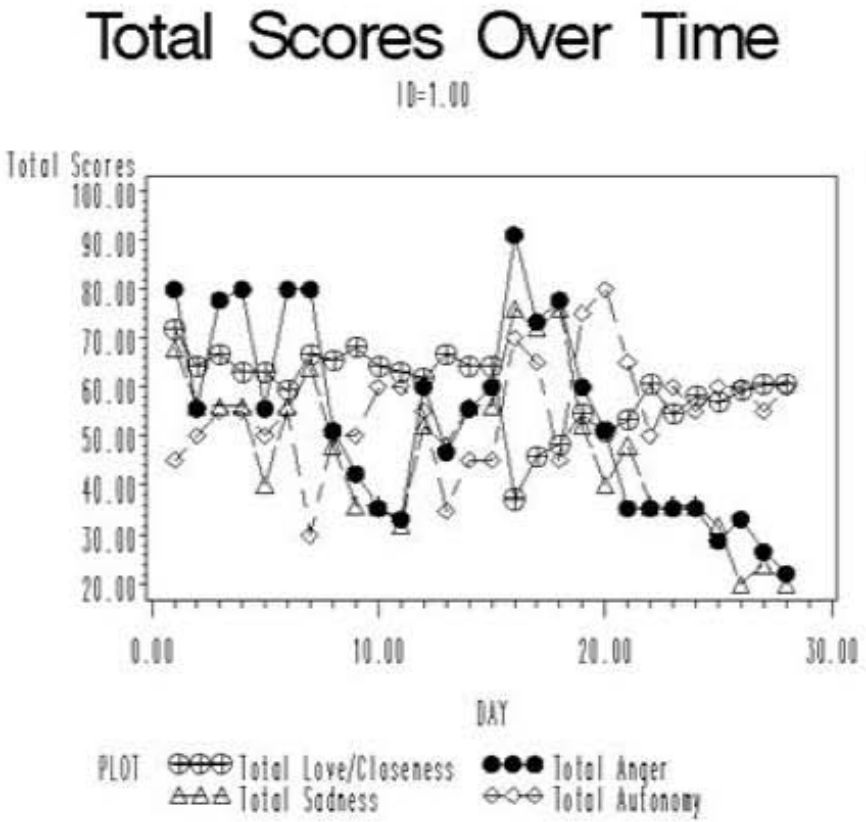
Note. df = degrees of freedom; Parms = parameters estimated in model;
CFI = Comparative Fit Index; RMSEA = root mean squared error of approximation.

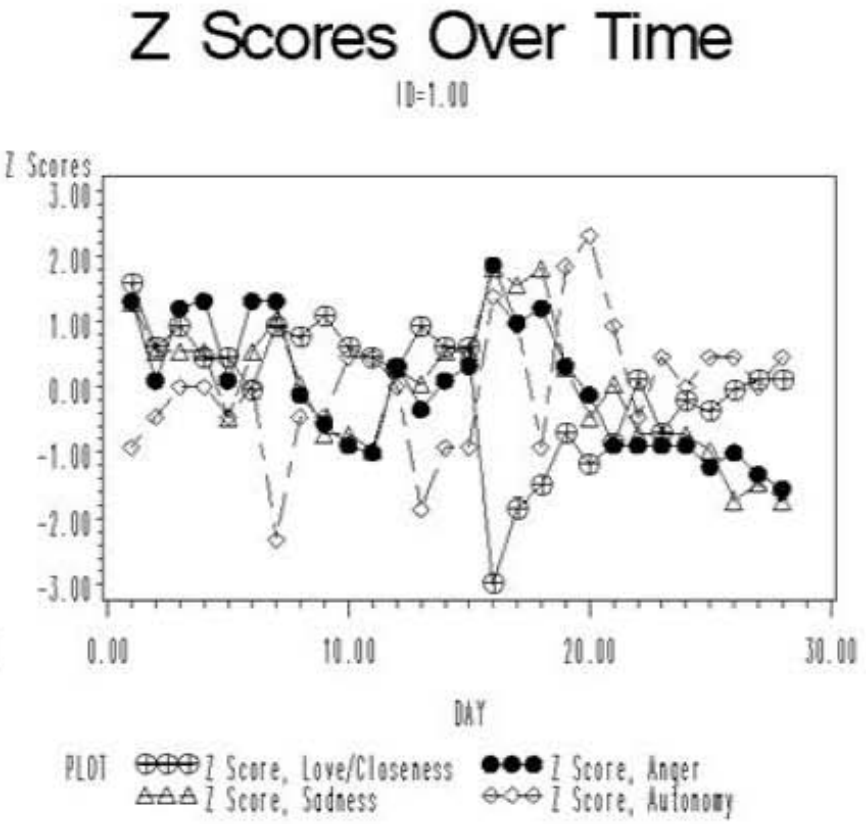
Table C9

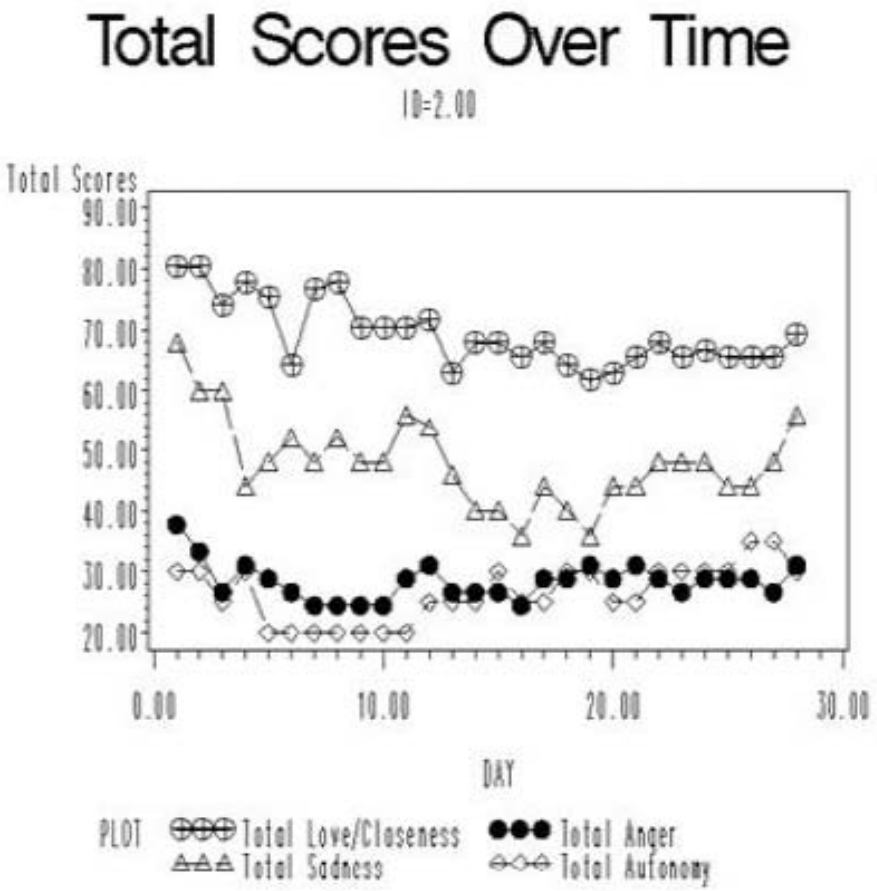
Items Selected for Dynamic Factor Analysis and Number of Participants Reporting Zero Variability for Each Item

Emotion (Hypothesized Factor)	Number of Participants Reporting Zero Variability (Percentage)
Enjoy being confided by him/her (Love)	6 (10%)
Lonely seek him/her out (Love)	1 (2%)
Hard without him/her (Love)	8 (14%)
Angry (Anger)	10 (17%)
Unhappy (Sadness)	8 (14%)
Peeved (Anger)	10 (17%)
Sad (Sadness)	5 (9%)
Annoyed (Anger)	4 (7%)
Lonely (Sadness)	10 (17%)
Relieved (Autonomy)	3 (5%)
Free (Autonomy)	1 (2%)
Strong (Autonomy)	3 (5%)

Appendix D: Individual Graphs



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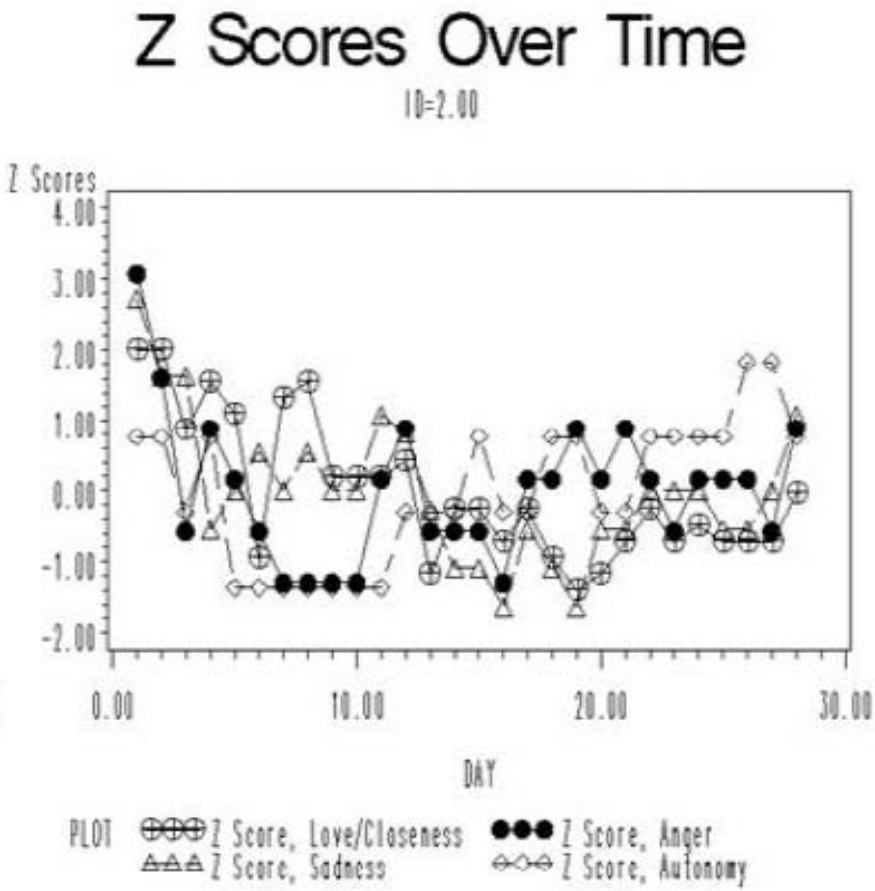
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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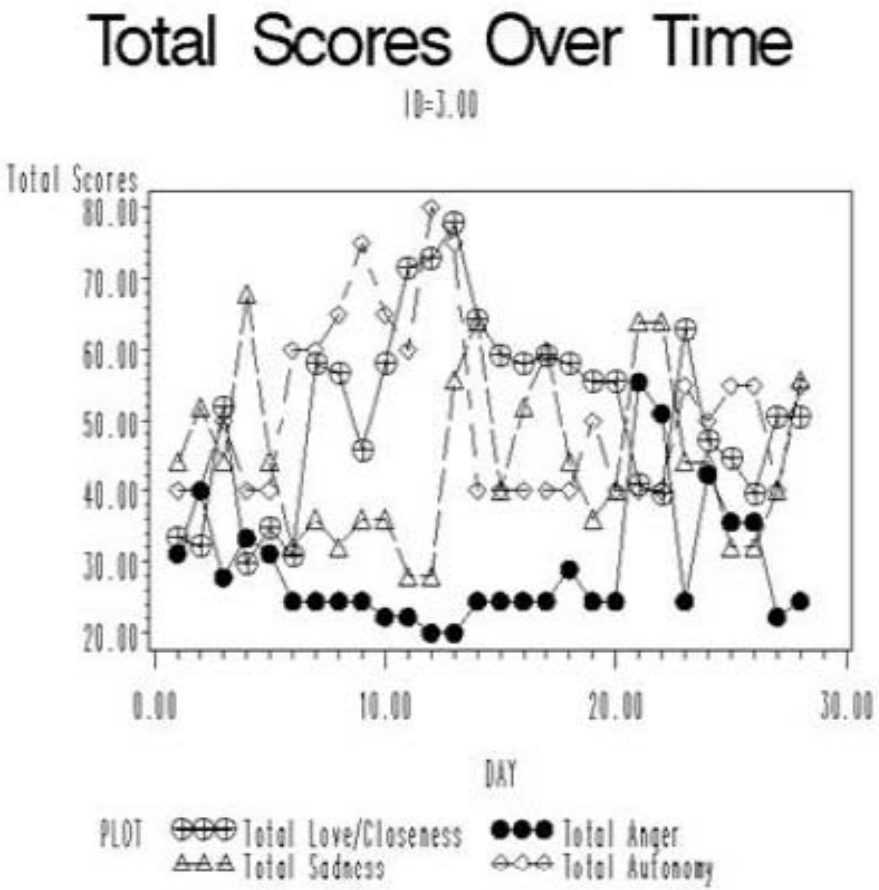
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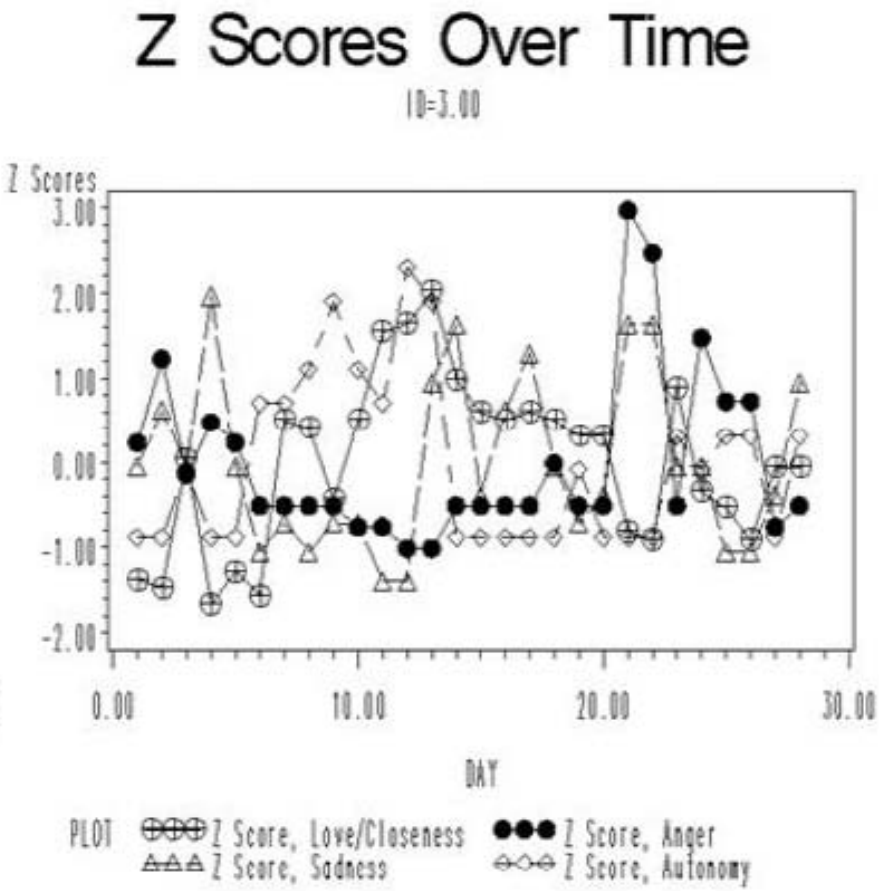
Total Anger
Total Sadness
Total Autonomy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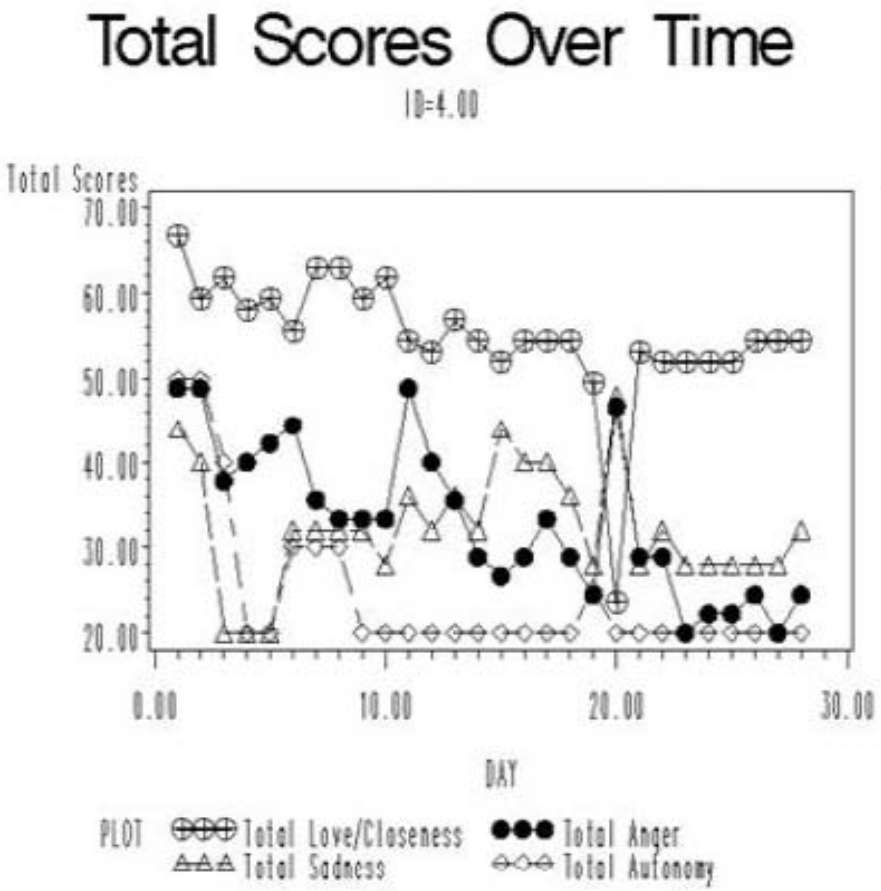
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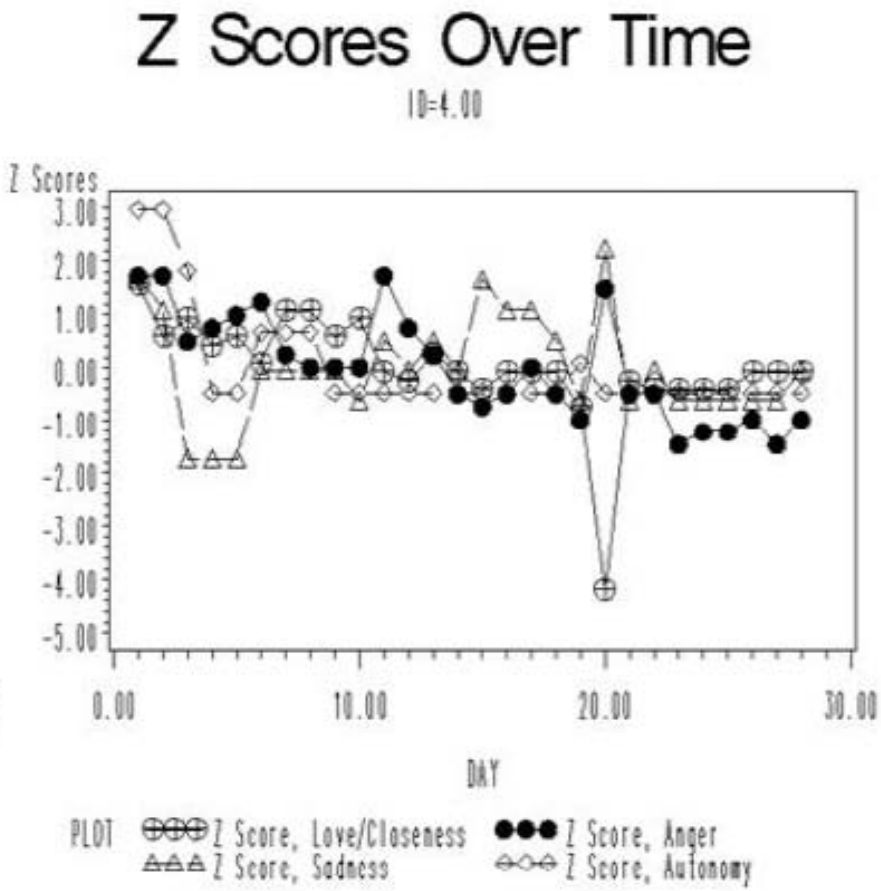
Total Anger
Total Sadness
Total Autonomy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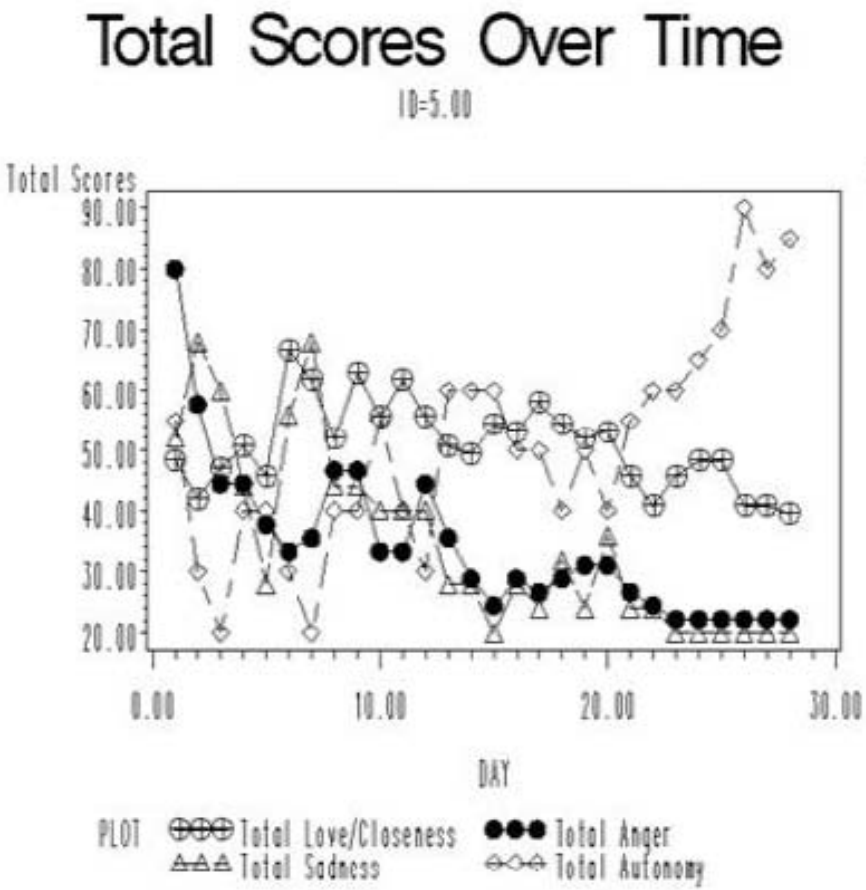
Z Score, Autonomy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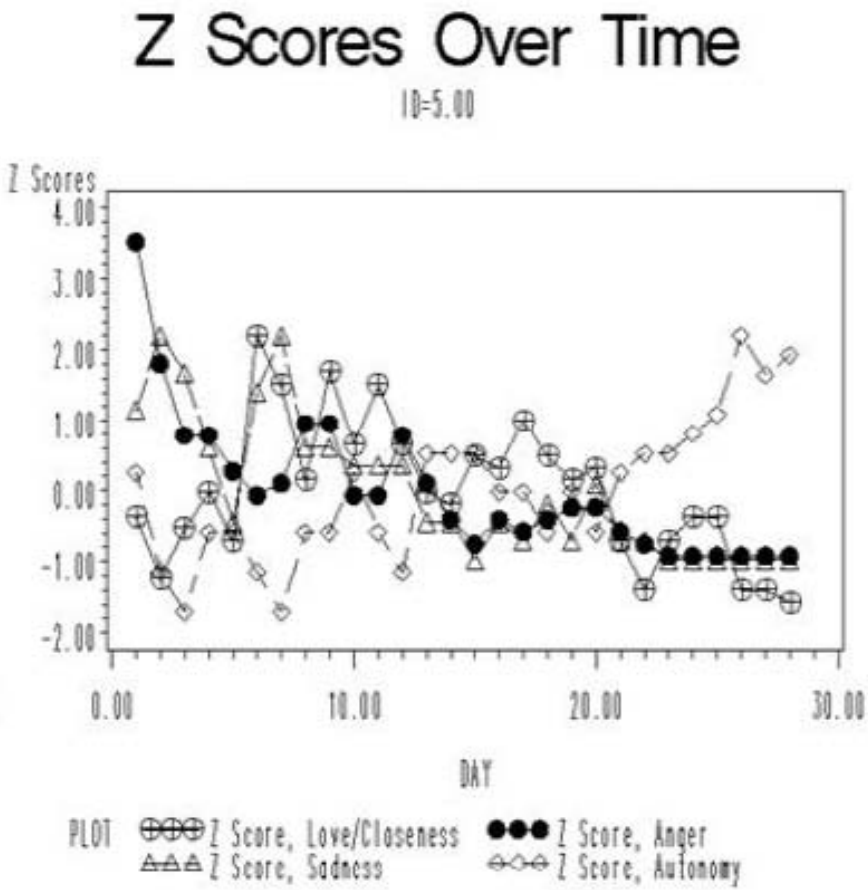
Total Anger
Total Sadness
Total Autonomy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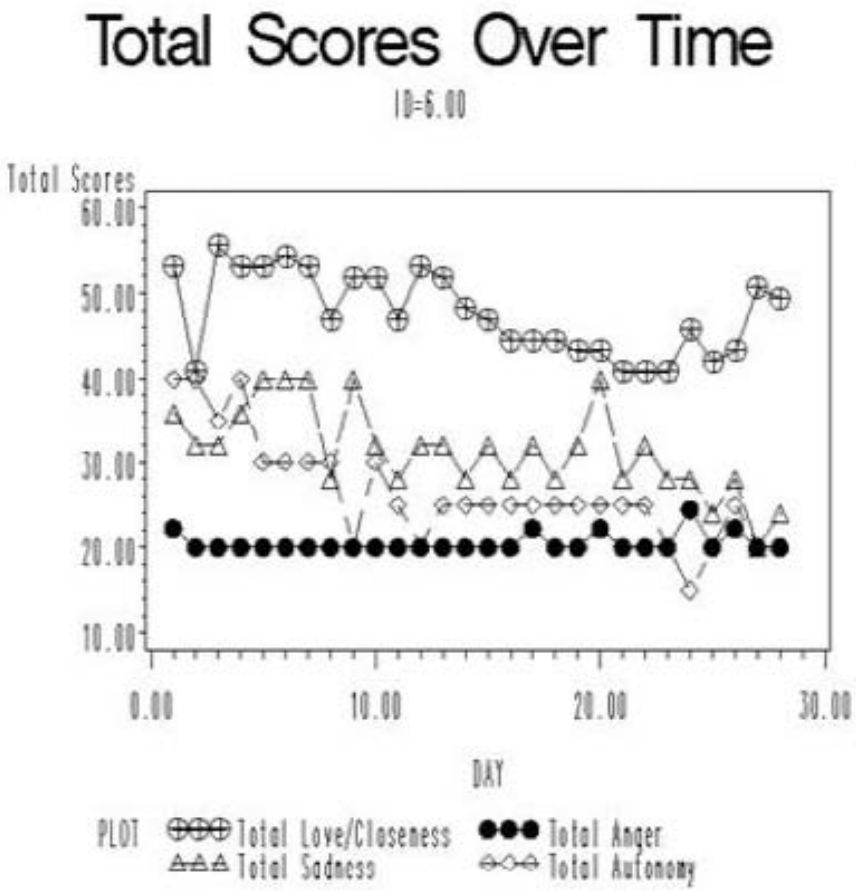
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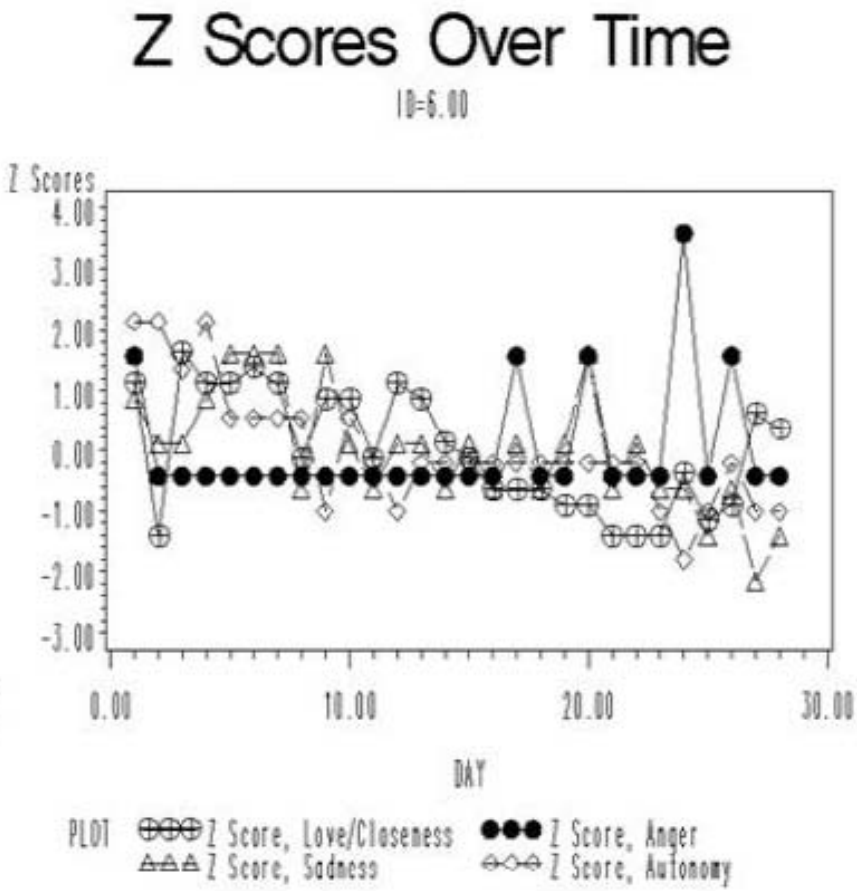
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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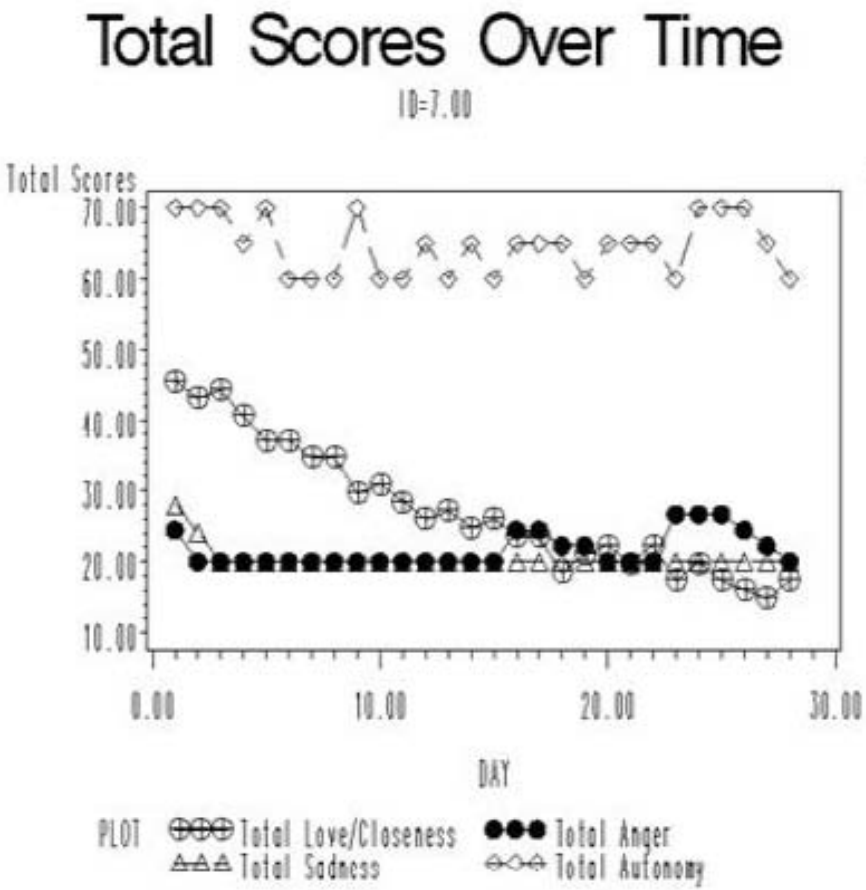
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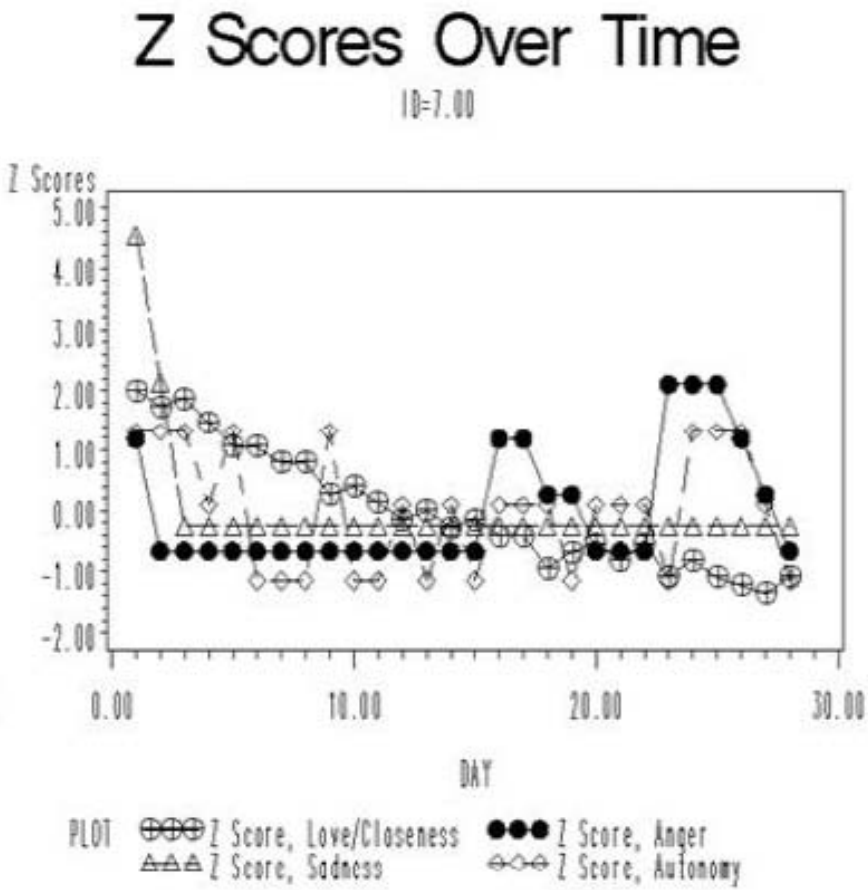
Total Anger
Total Sadness
Total Autonomy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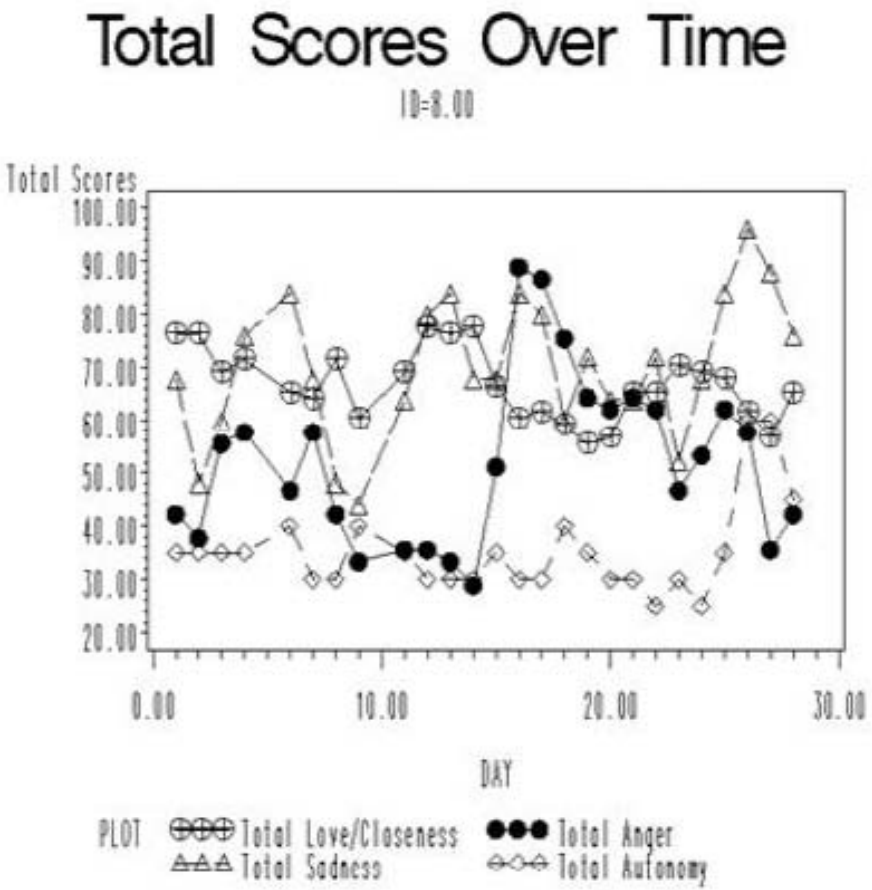
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Total Anger
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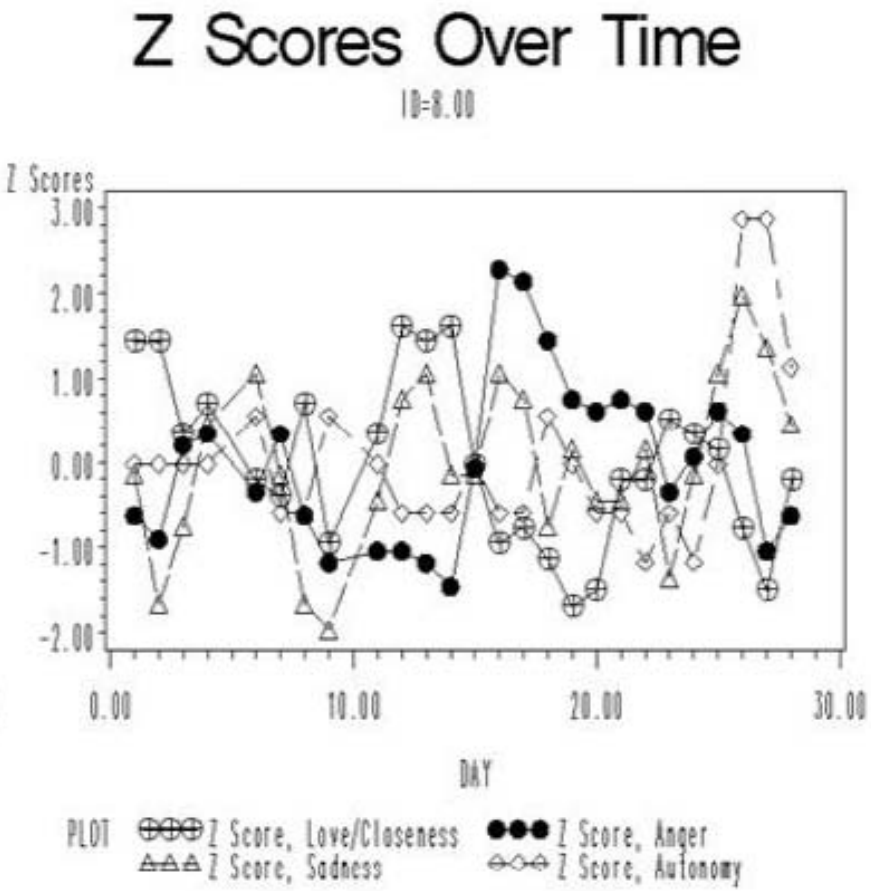
Total Autonomy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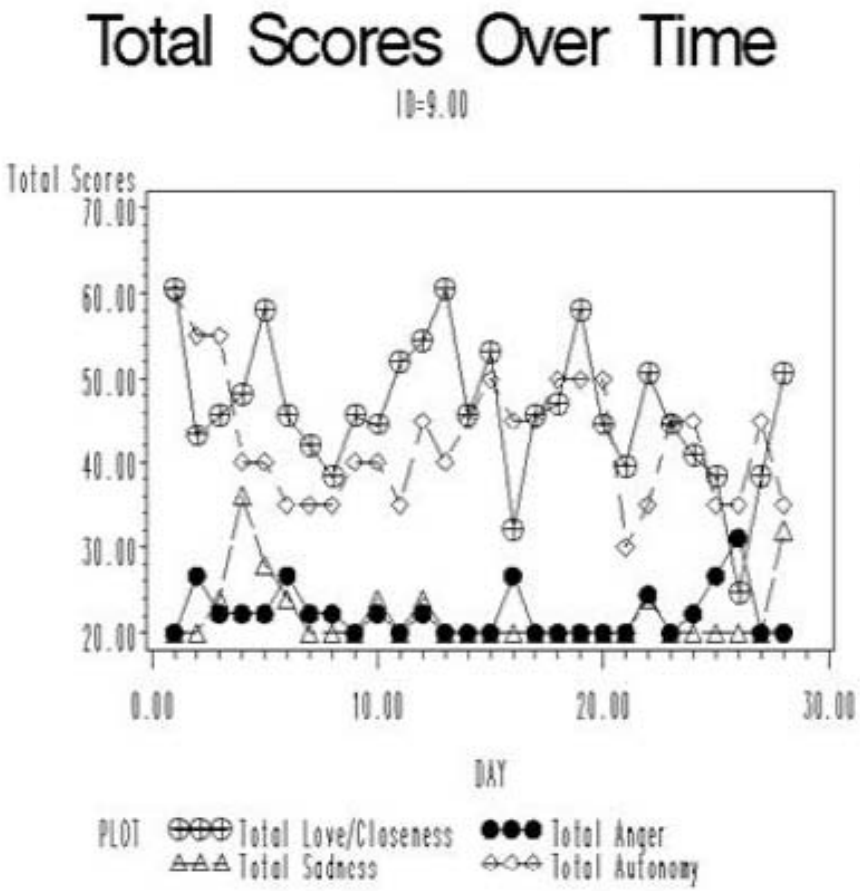
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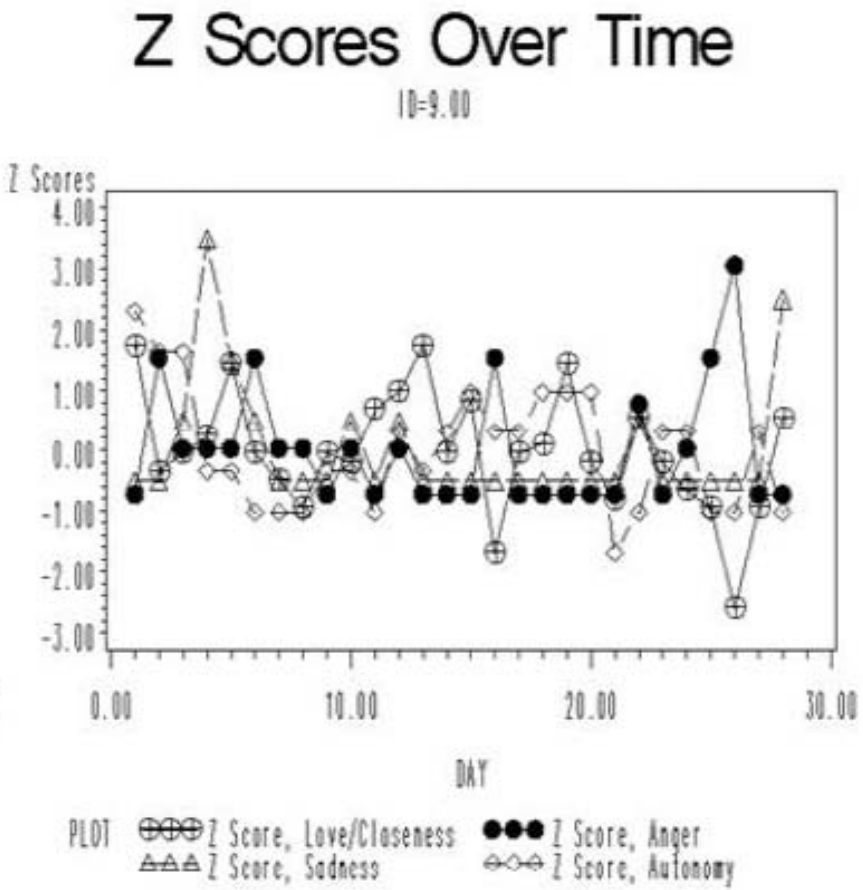
Total Autonomy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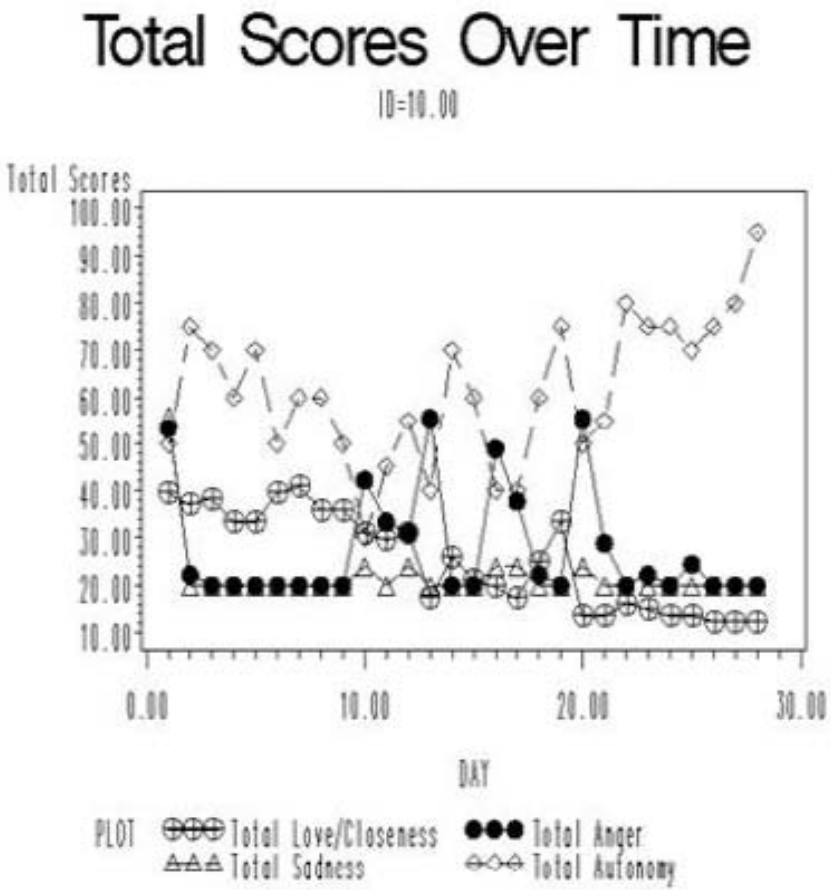
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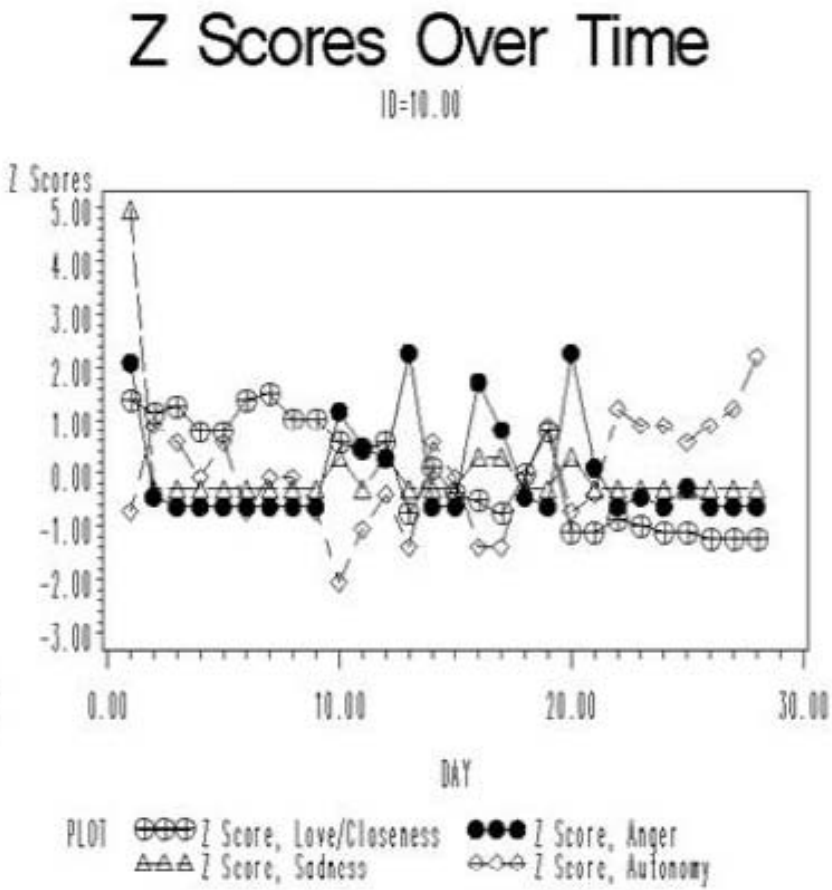
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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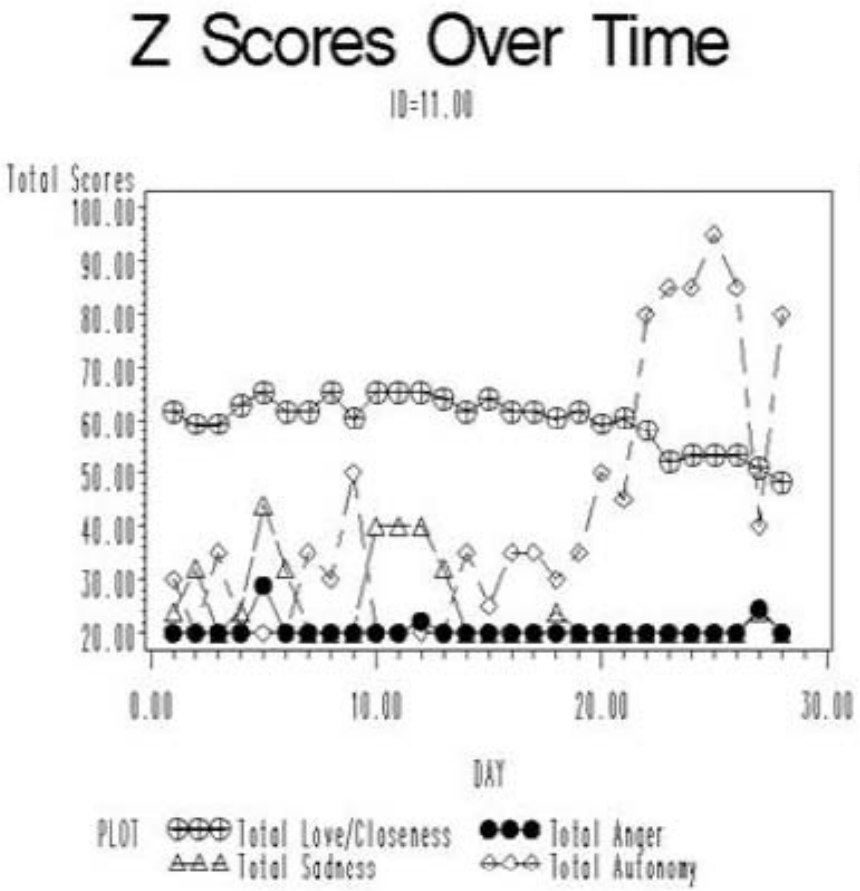
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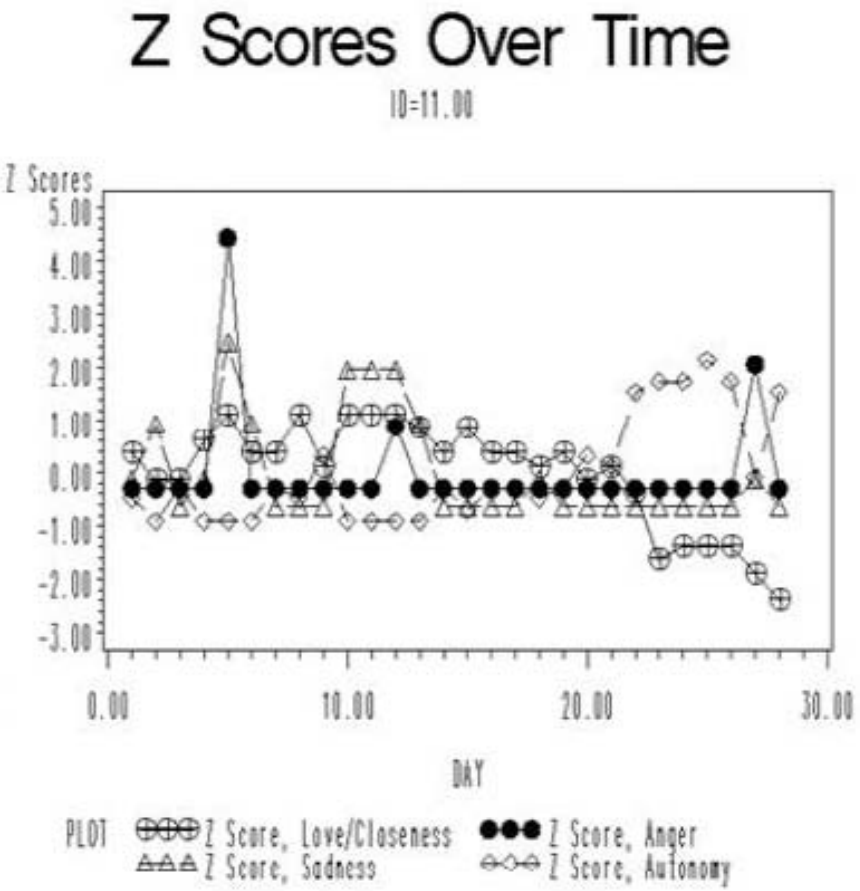
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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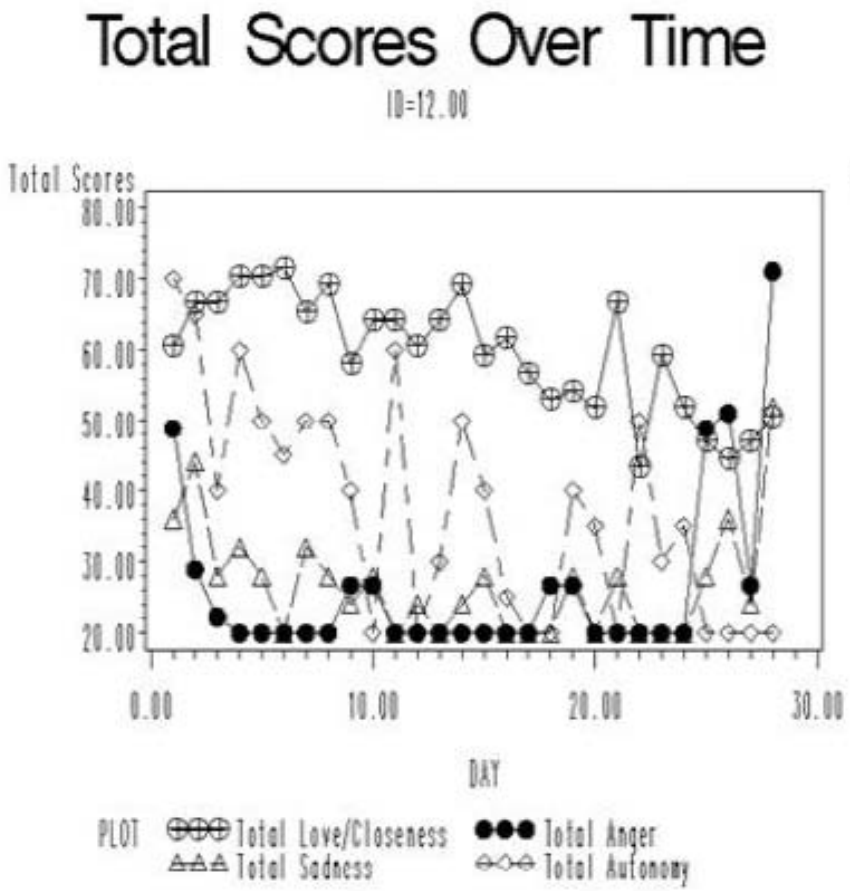
DAY
PLOT
Z Score, Love/Closeness
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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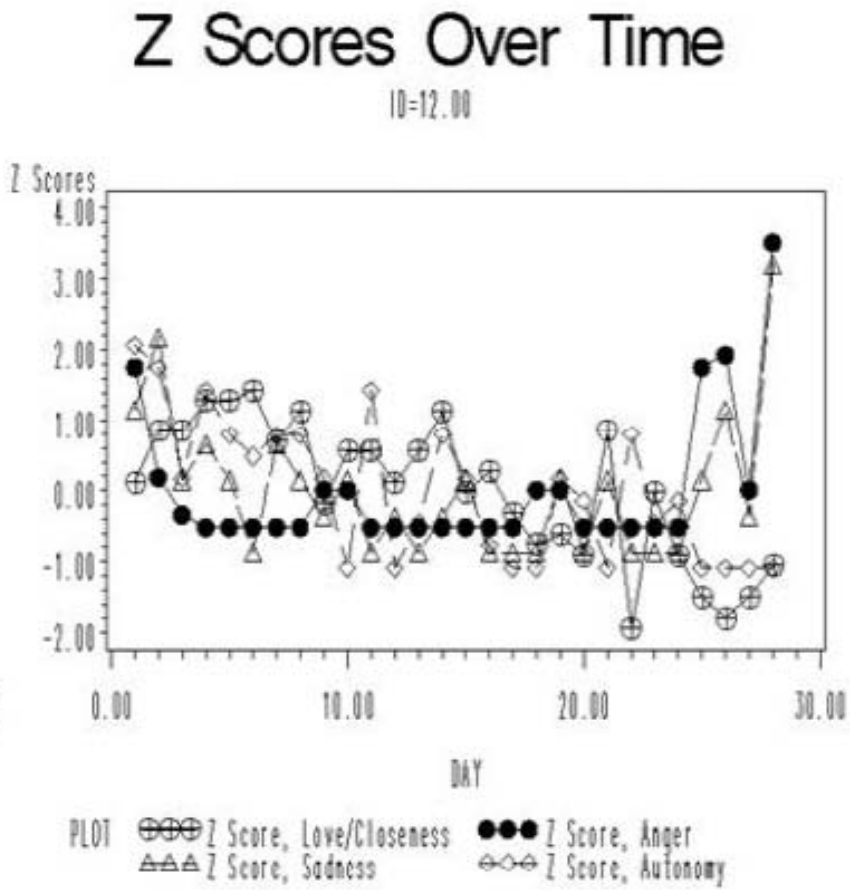
30.00
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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1.00
0.00
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-2.00
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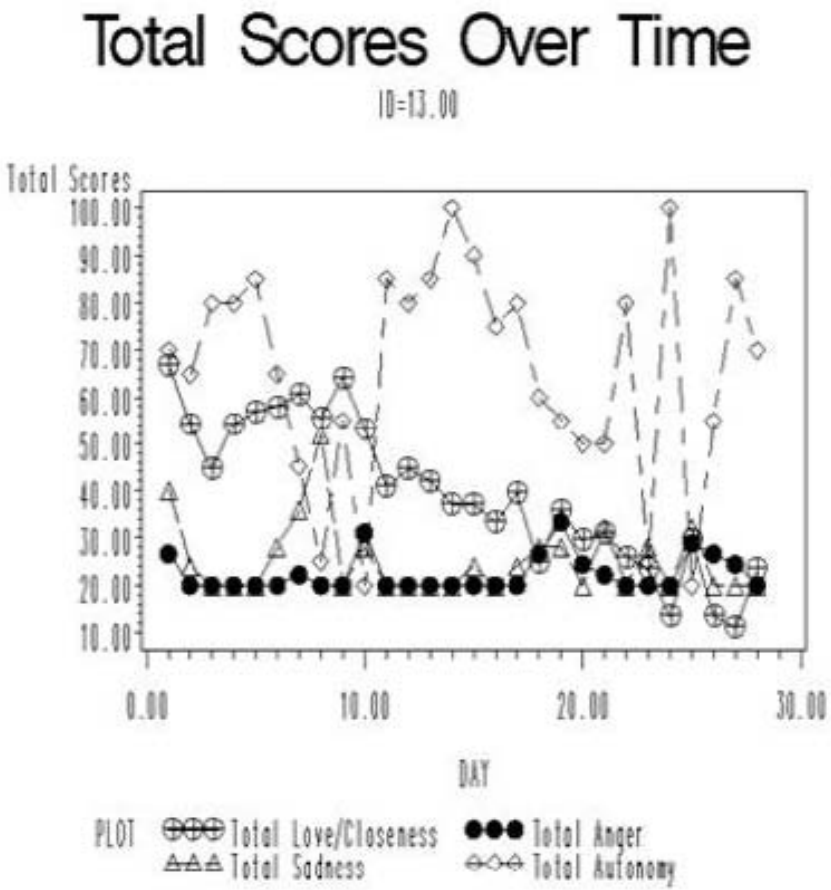
30.00
DAY
PLOT
Z Score, Love/Closeness
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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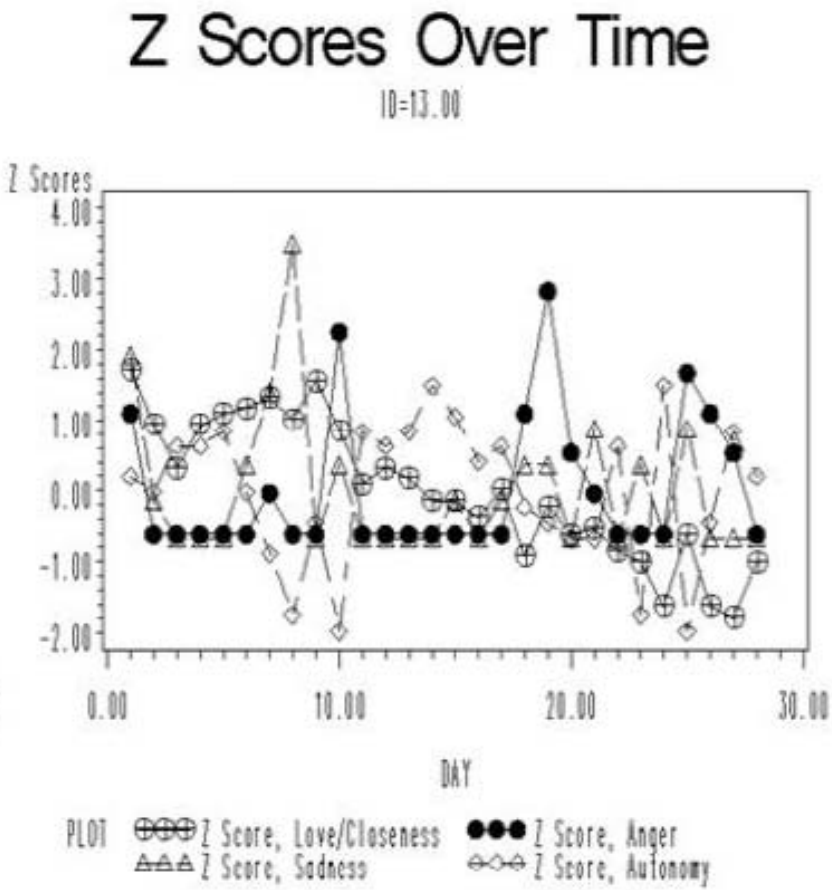
20.00
30.00
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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2.00
1.00
0.00
-1.00
-2.00
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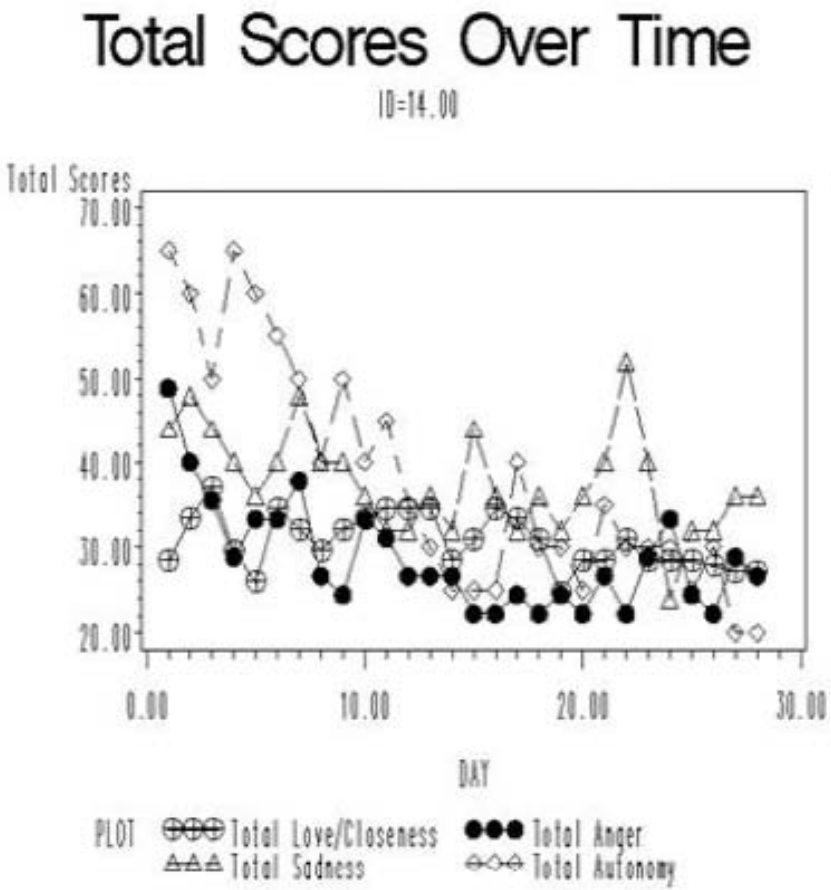
10.00
20.00
30.00
DAY
PLOT
Z Score, Love/Closeness
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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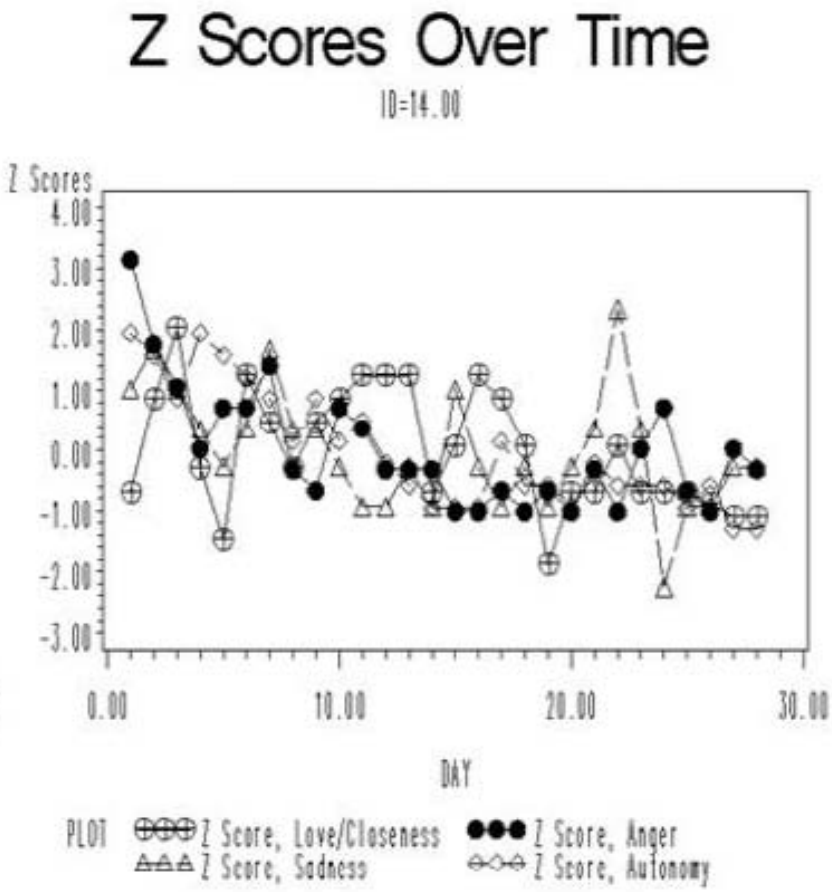
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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2.00
1.00
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-2.00
-3.00
0.00
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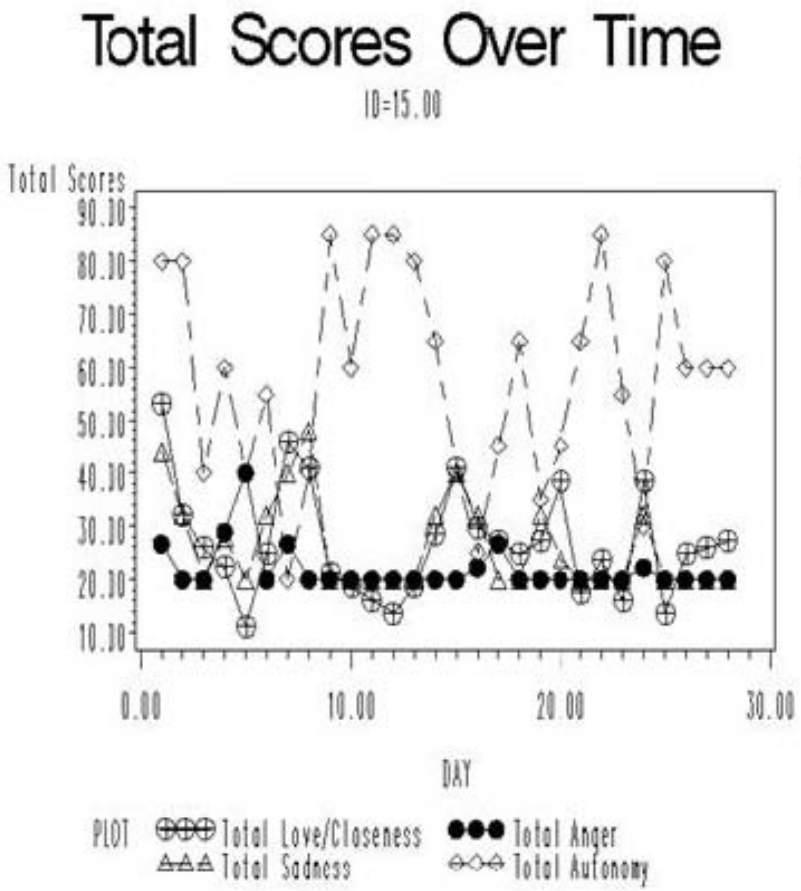
20.00
30.00
DAY
PLOT
Z Score, Love/Closeness
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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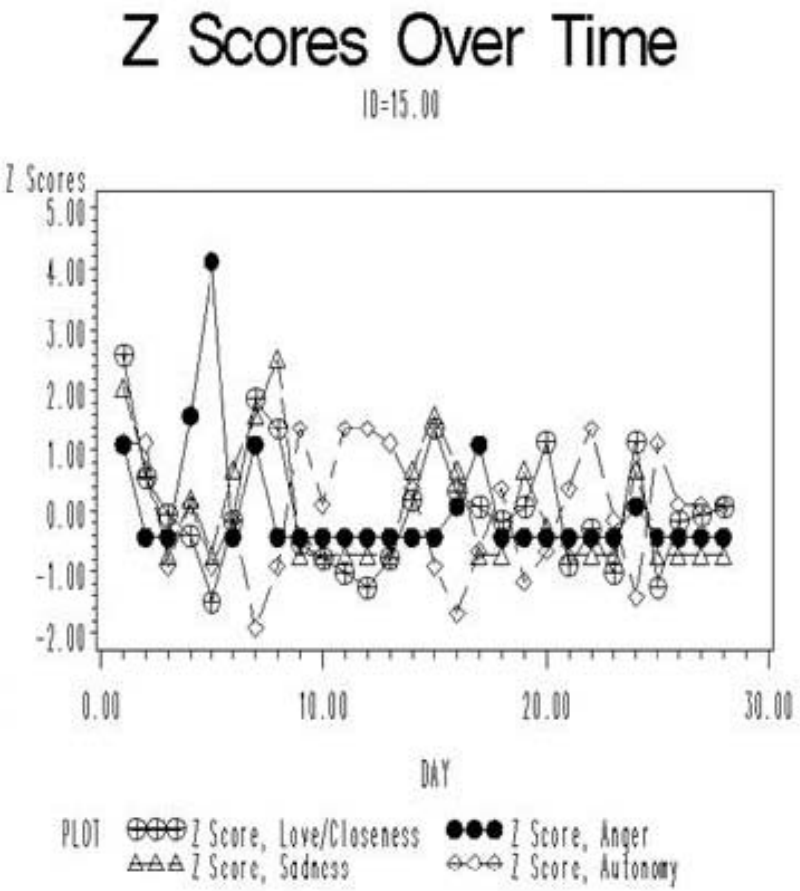
30.00
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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3.00
2.00
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0.00
-1.00
-2.00
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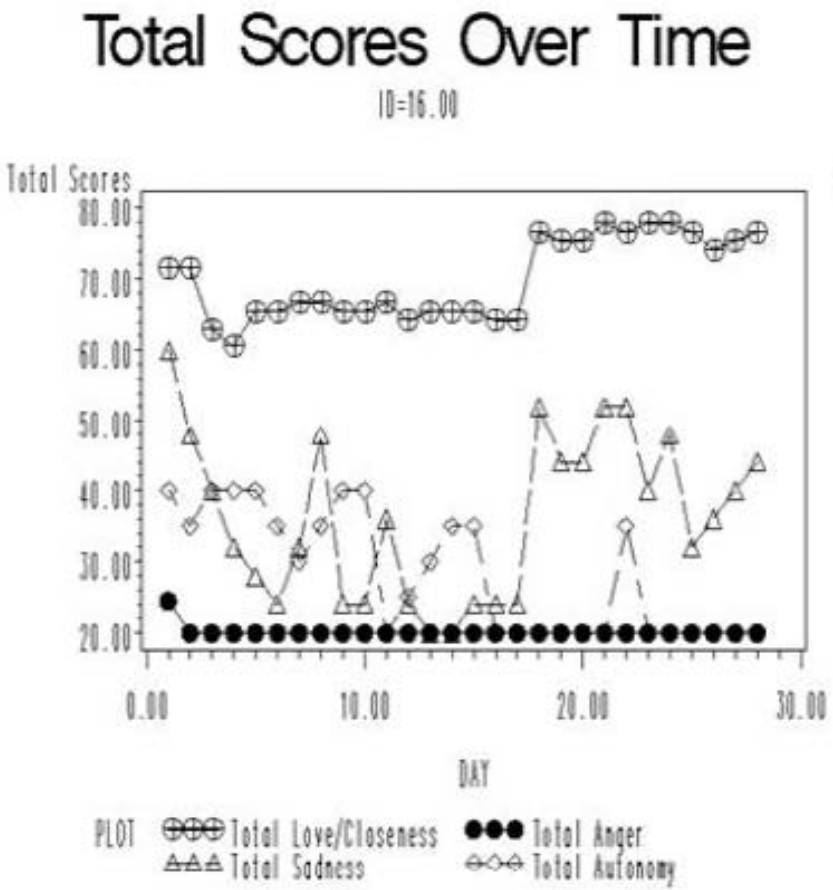
20.00
30.00
DAY
PLOT
Z Score, Love/Closeness
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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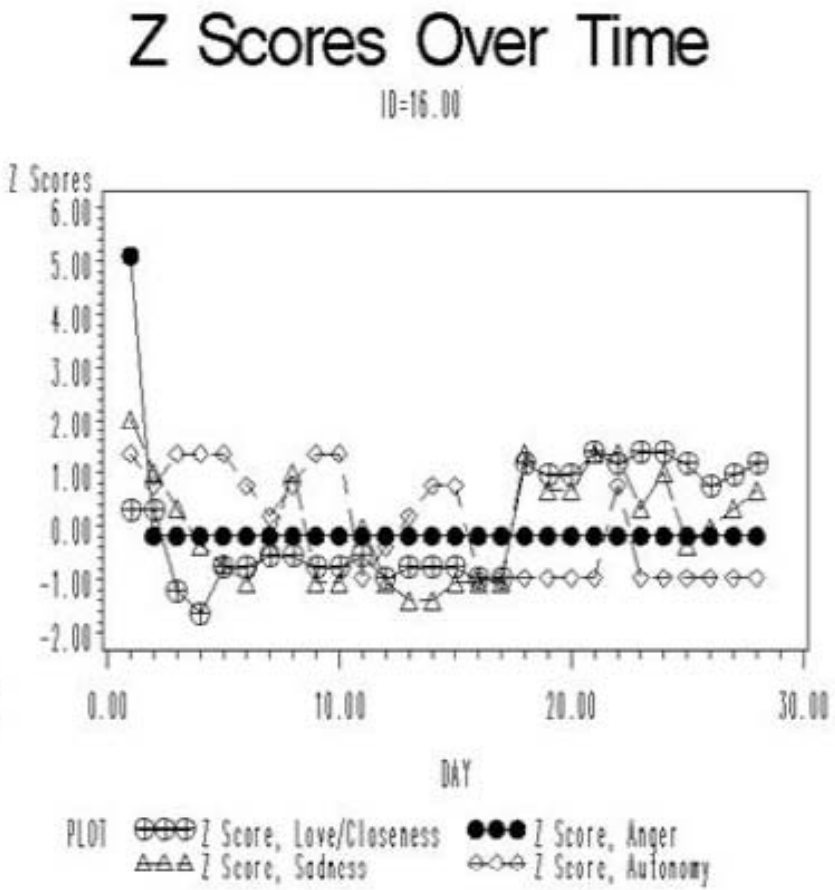
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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3.00
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1.00
0.00
-1.00
-2.00
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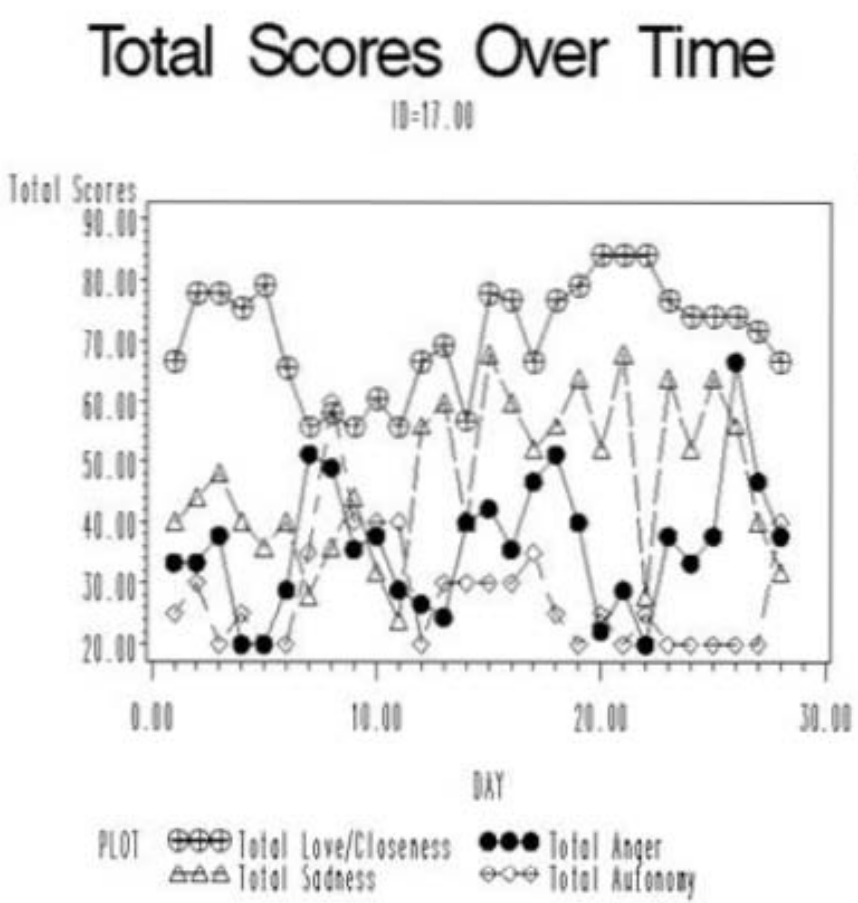
20.00
30.00
DAY
PLOT
Z Score, Love/Closeness
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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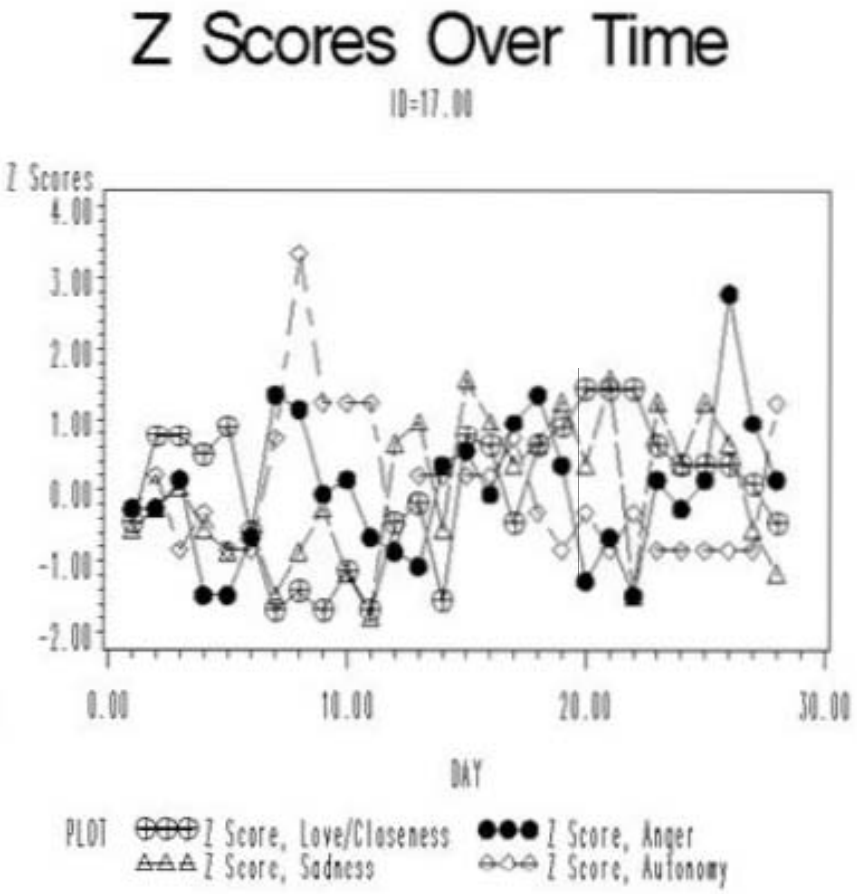
30.00
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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DAY
PLOT
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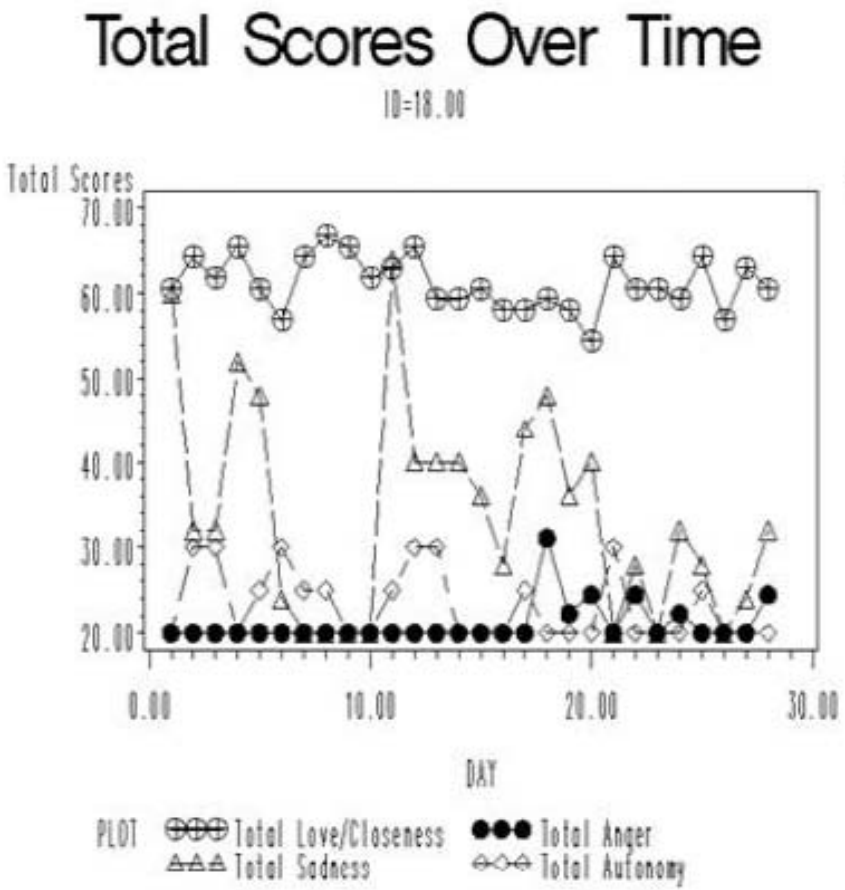
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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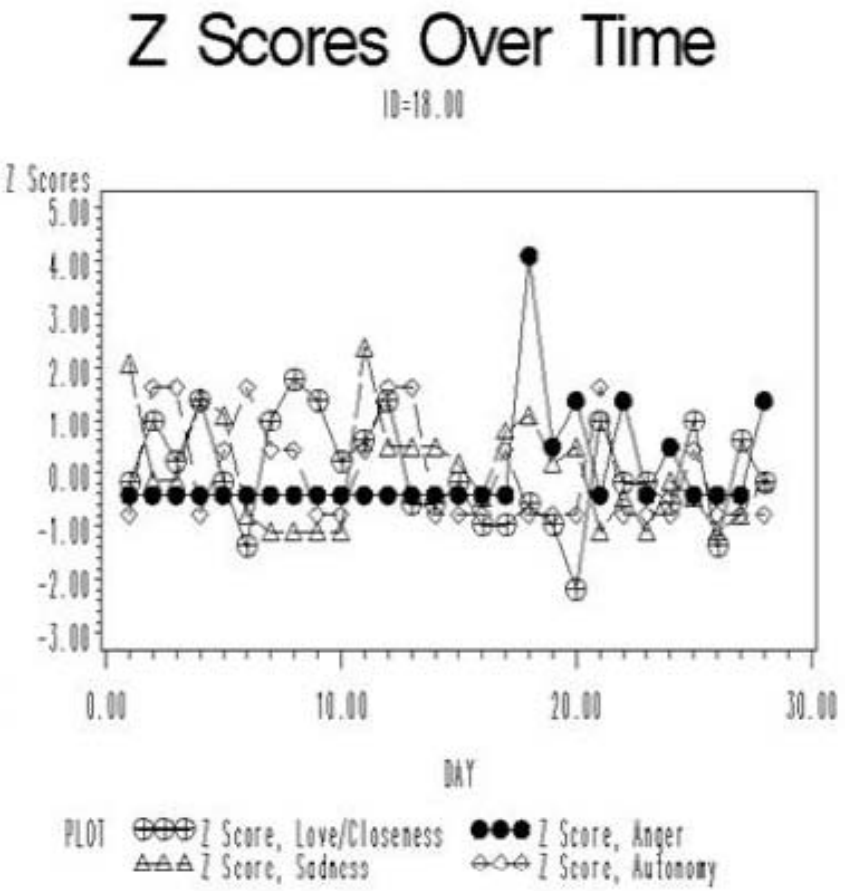
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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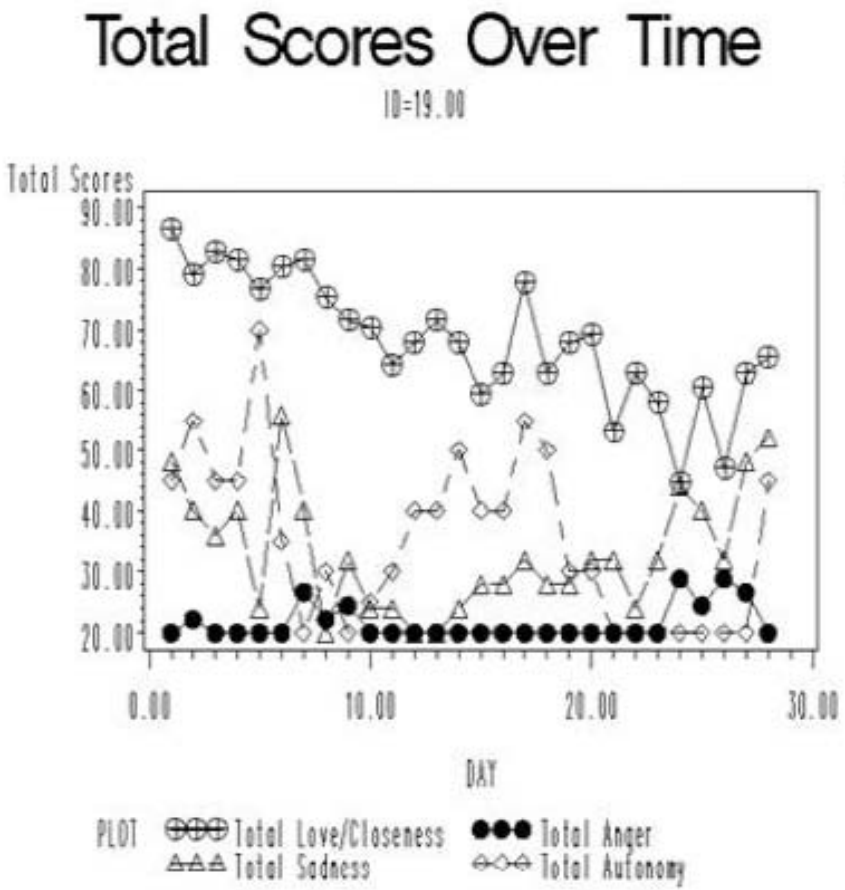
30.00
DAY
PLOT
Z Score, Love/Closeness
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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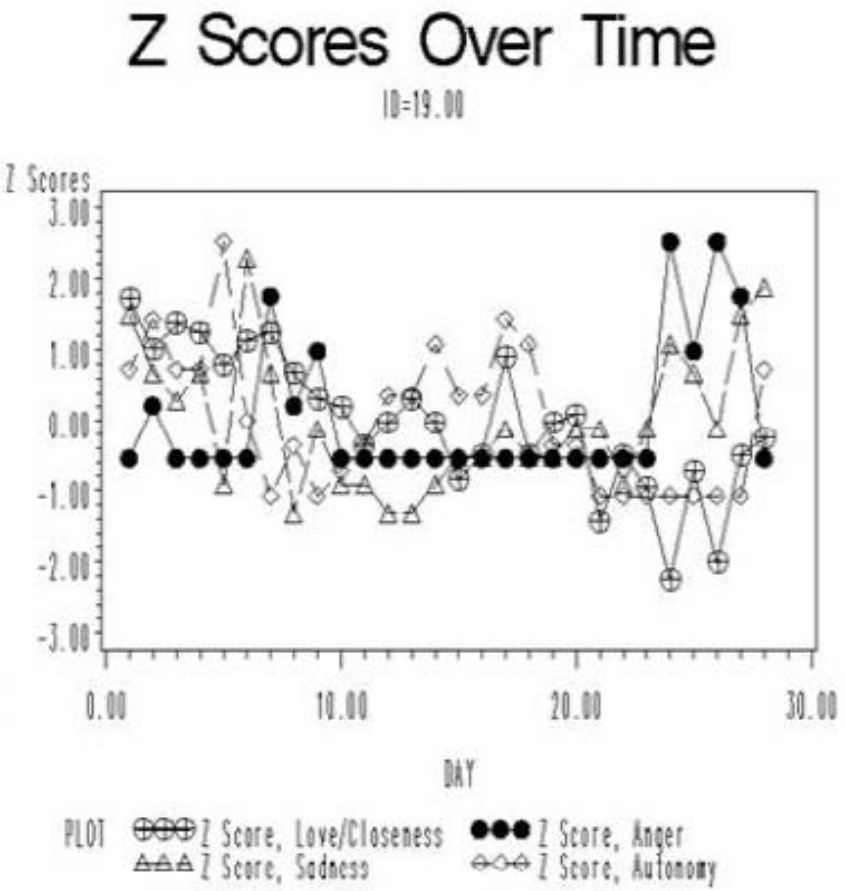
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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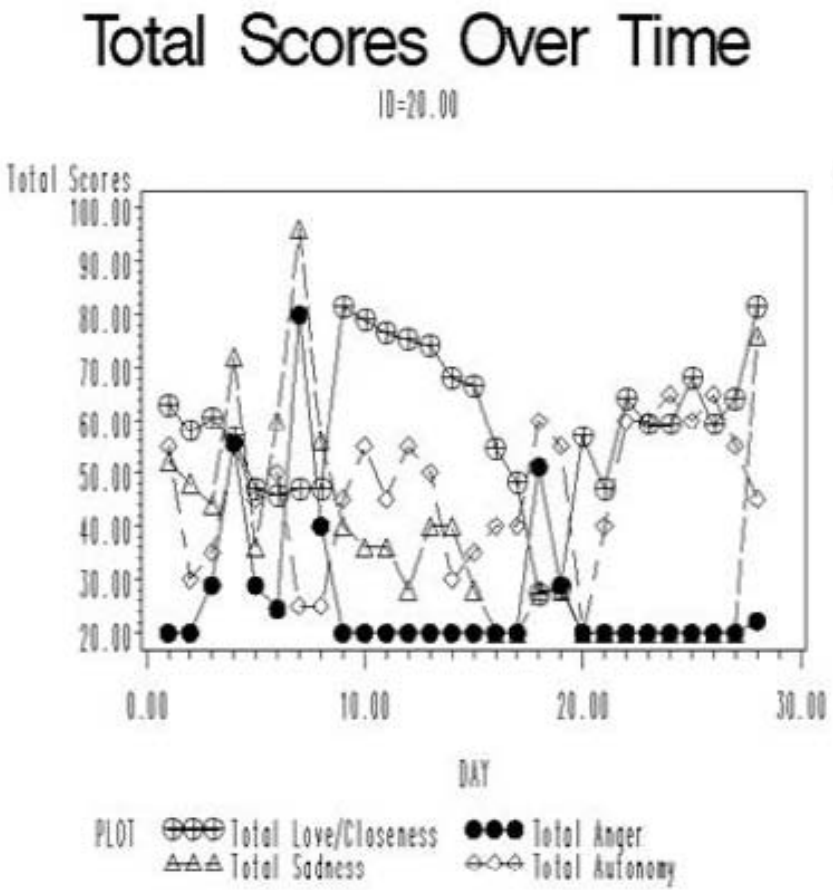
DAY
PLOT
Z Score, Love/Closeness
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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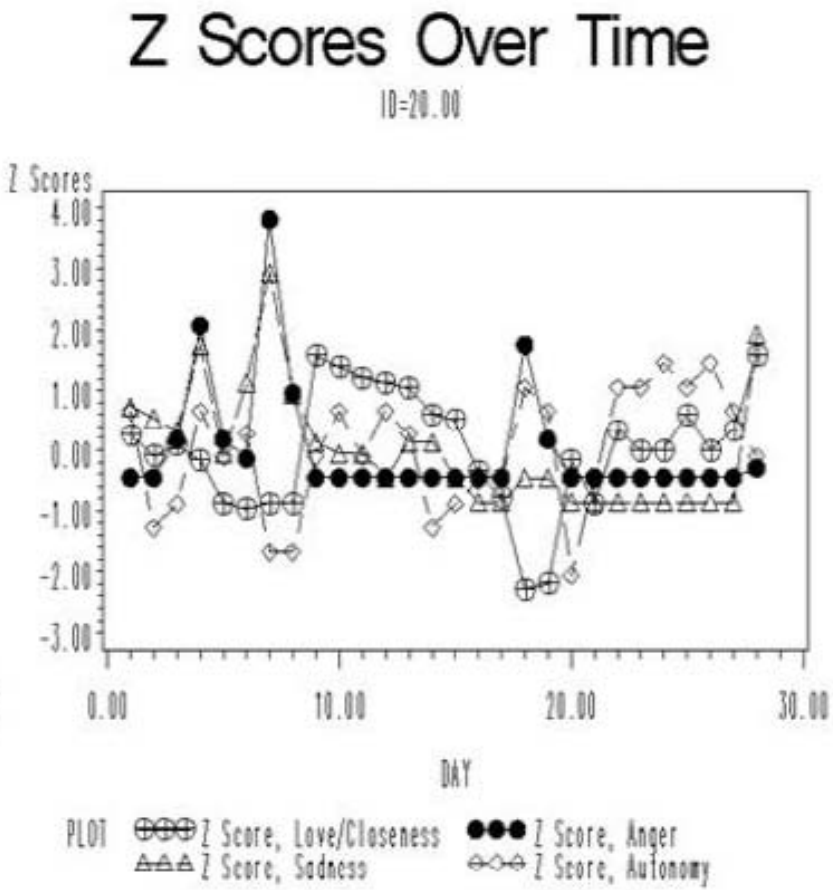
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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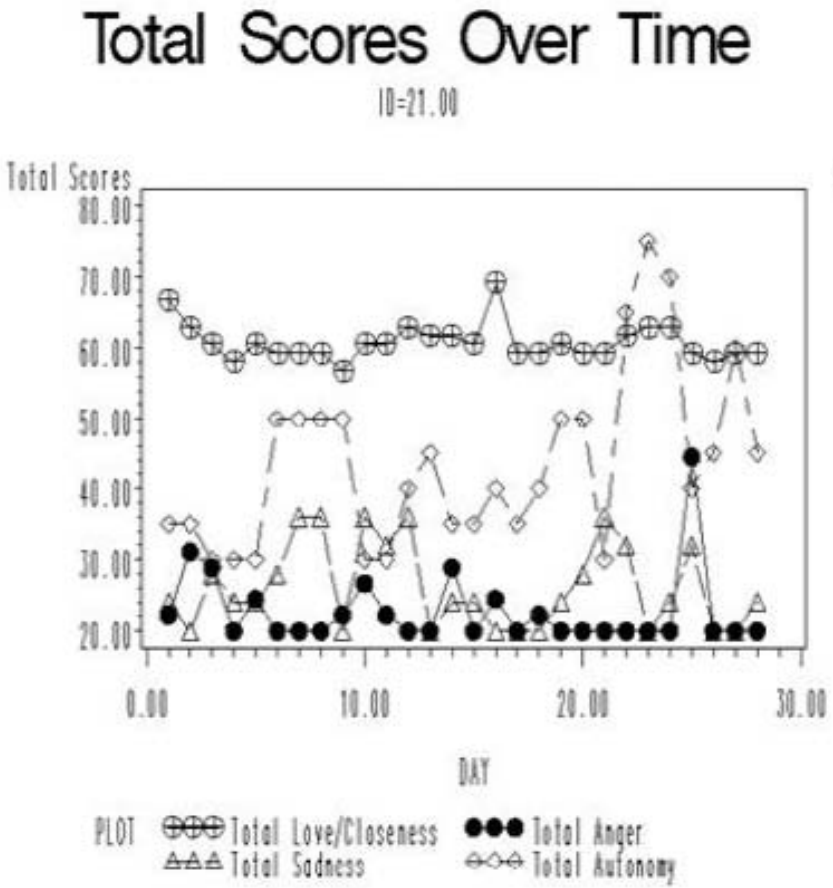
30.00
DAY
PLOT
Z Score, Love/Closeness
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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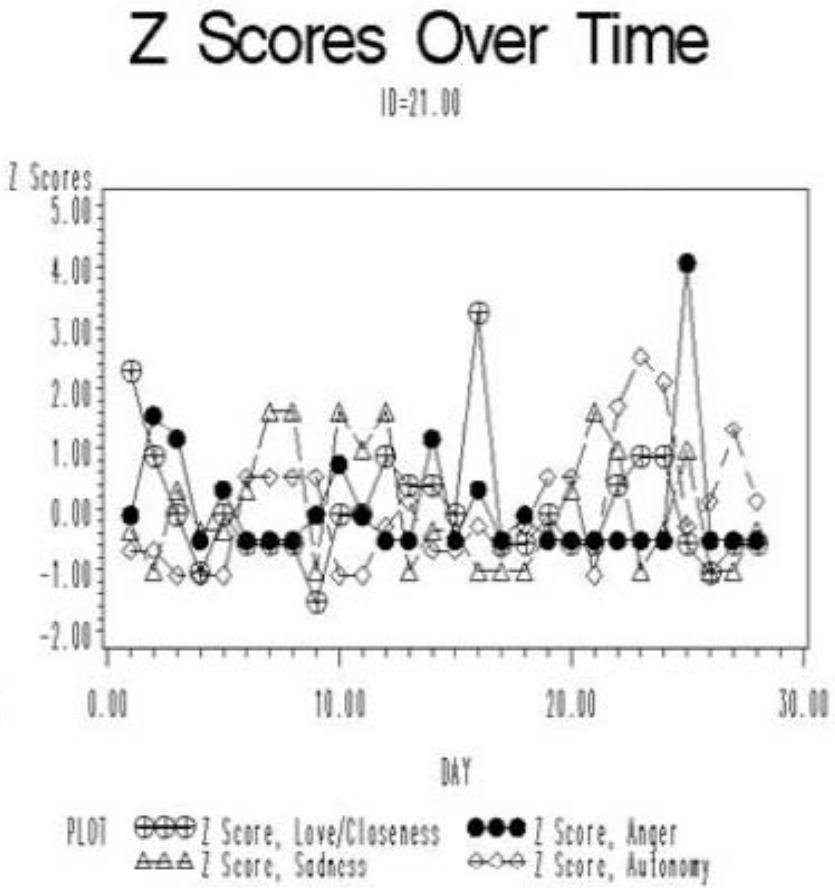
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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-1.00
-2.00
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30.00
DAY
PLOT
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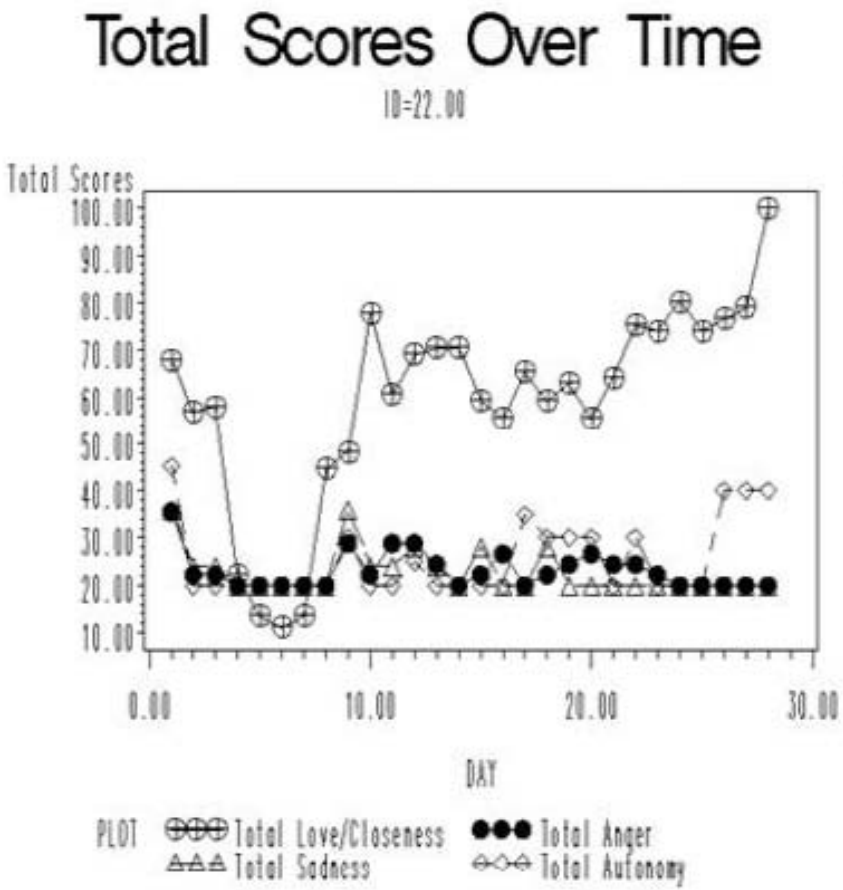
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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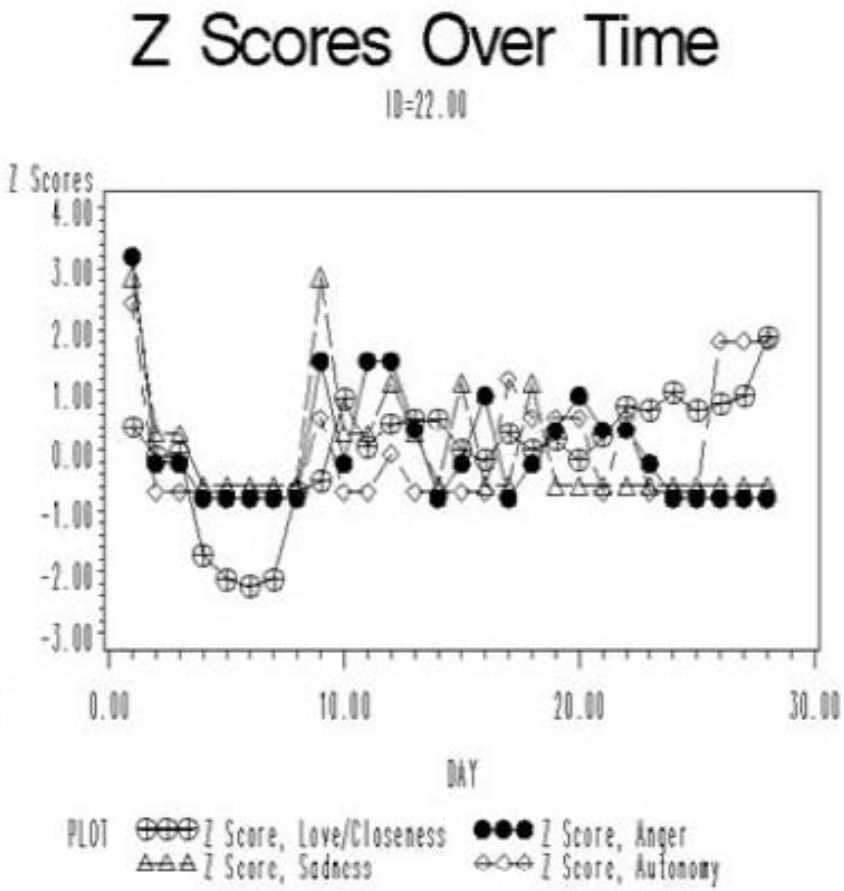
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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Z Score, Anger
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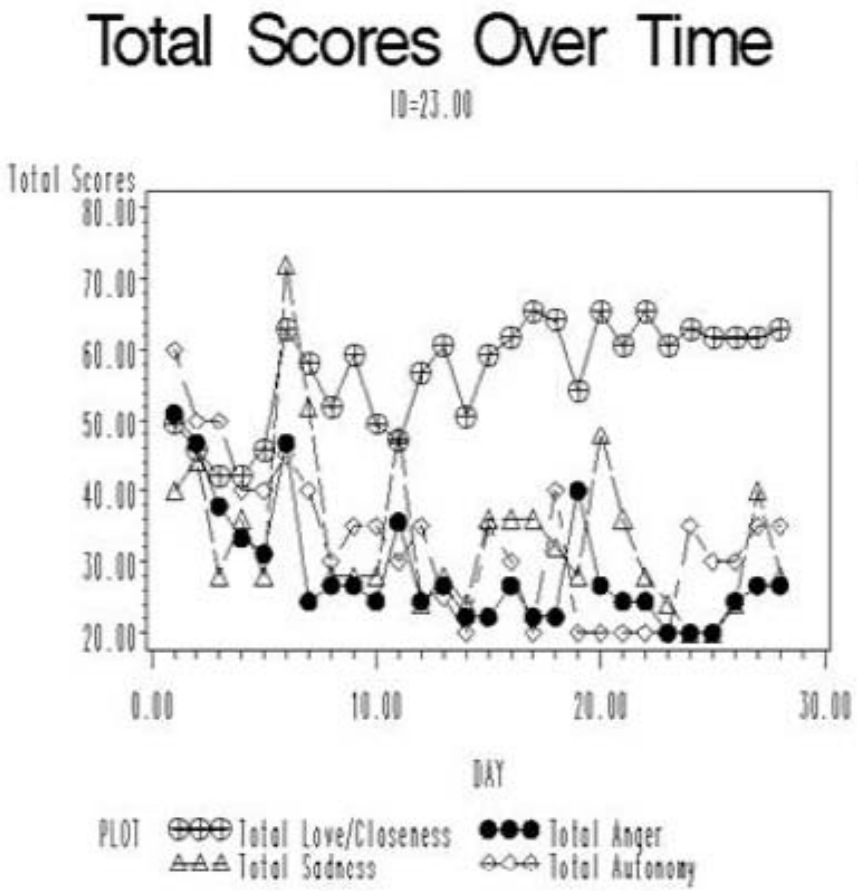
Z Score, Autonomy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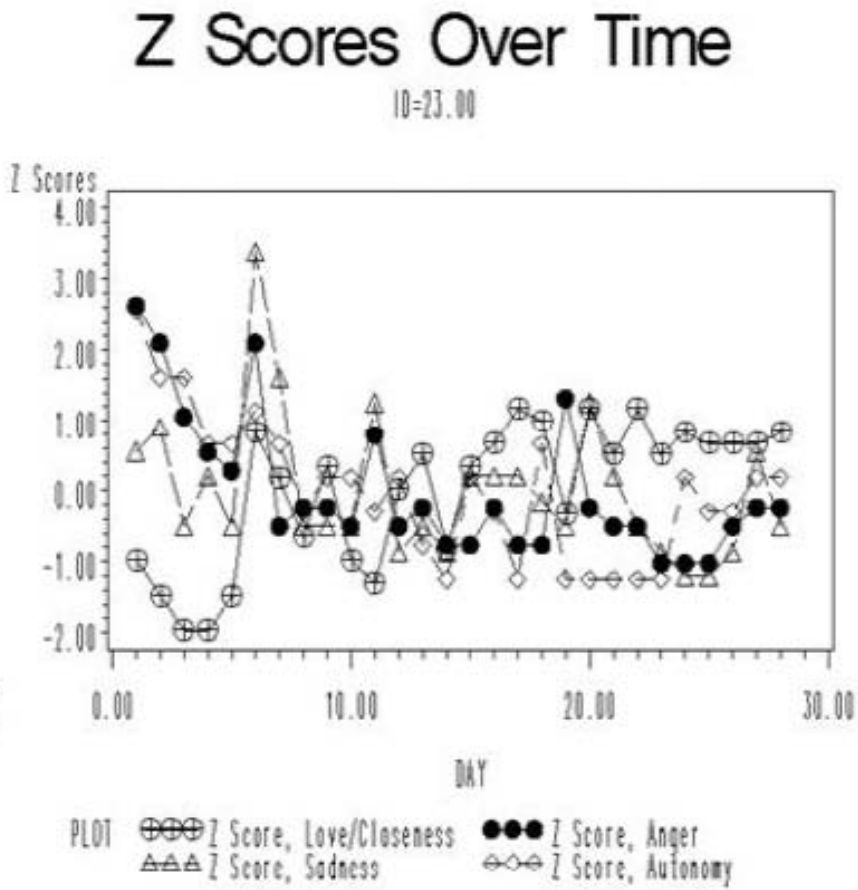
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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Z Score, Anger
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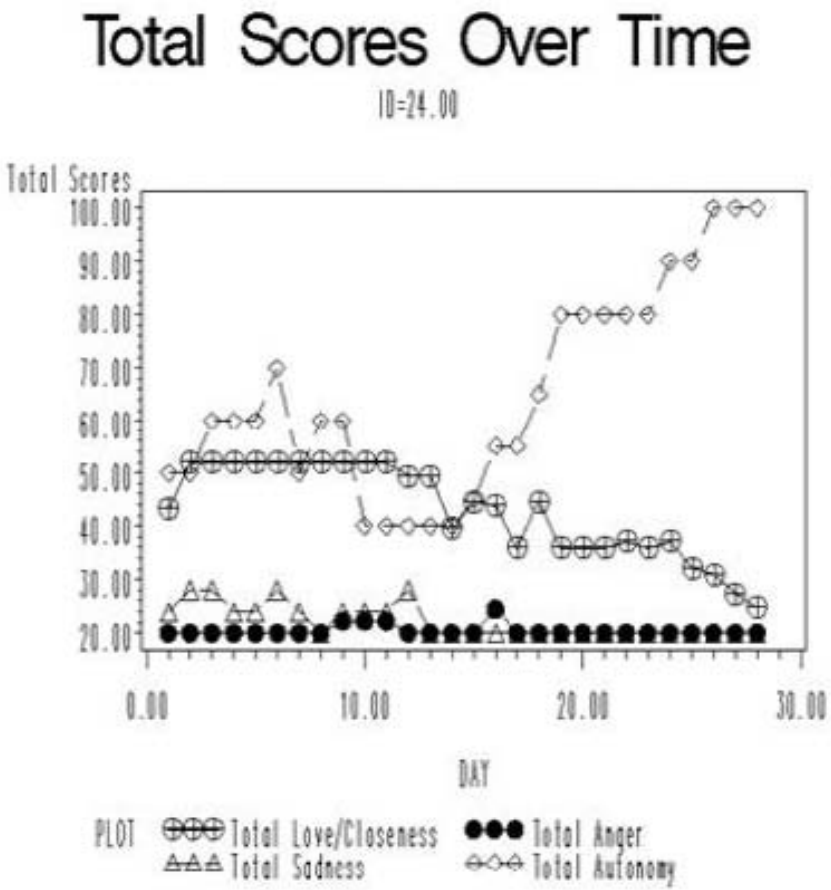
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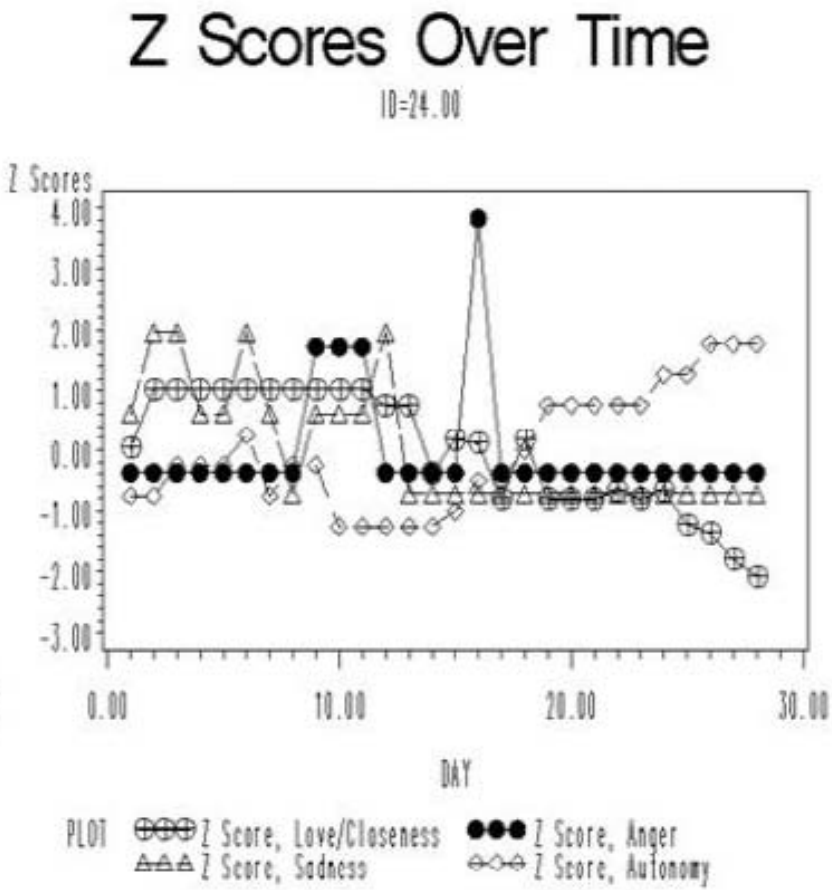
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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Z Score, Anger
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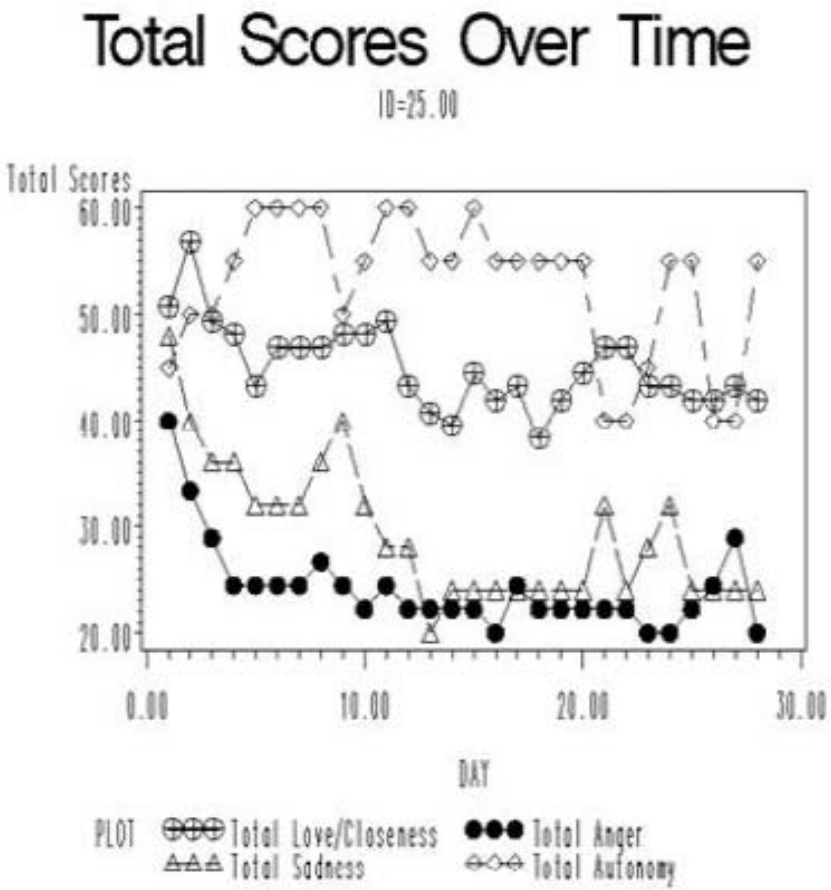
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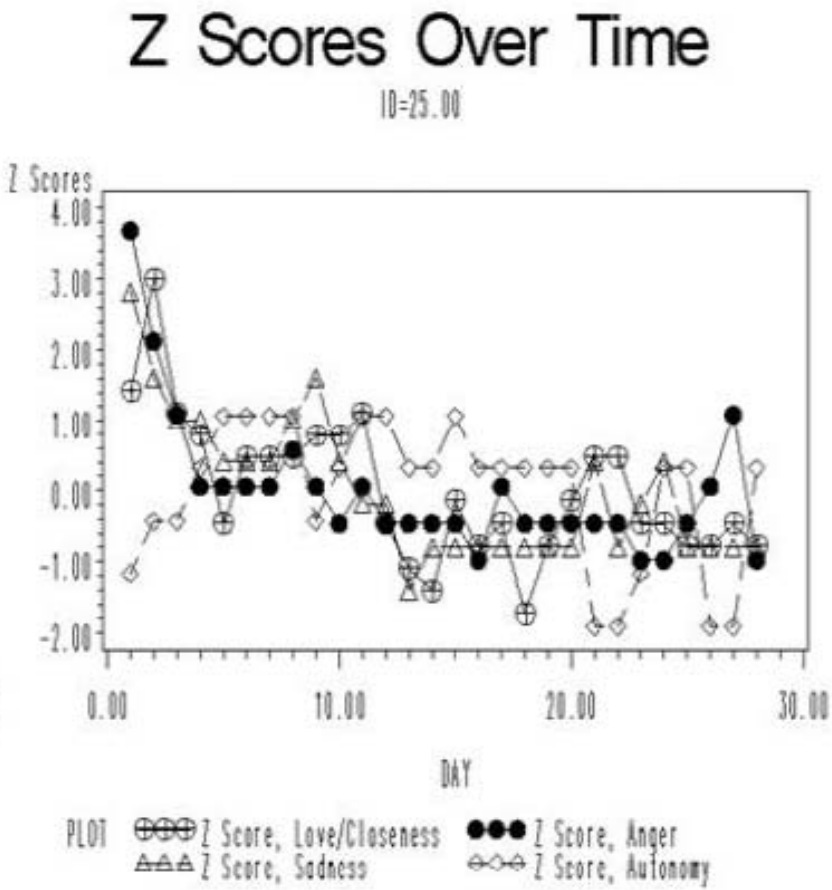
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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Z Score, Anger
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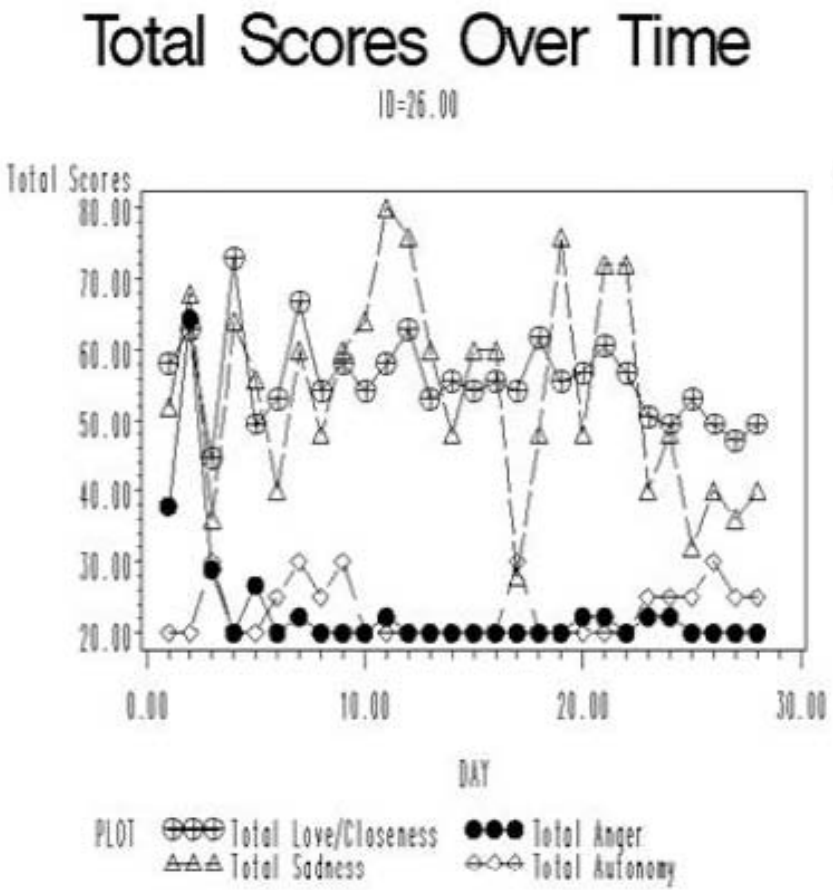
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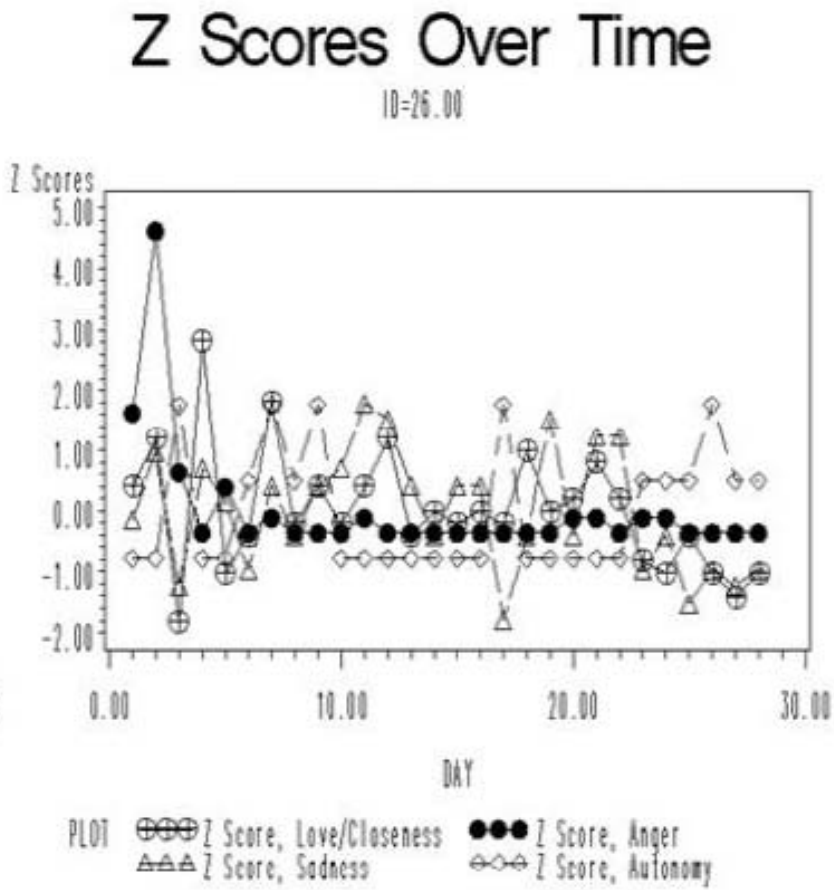
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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Z Score, Anger
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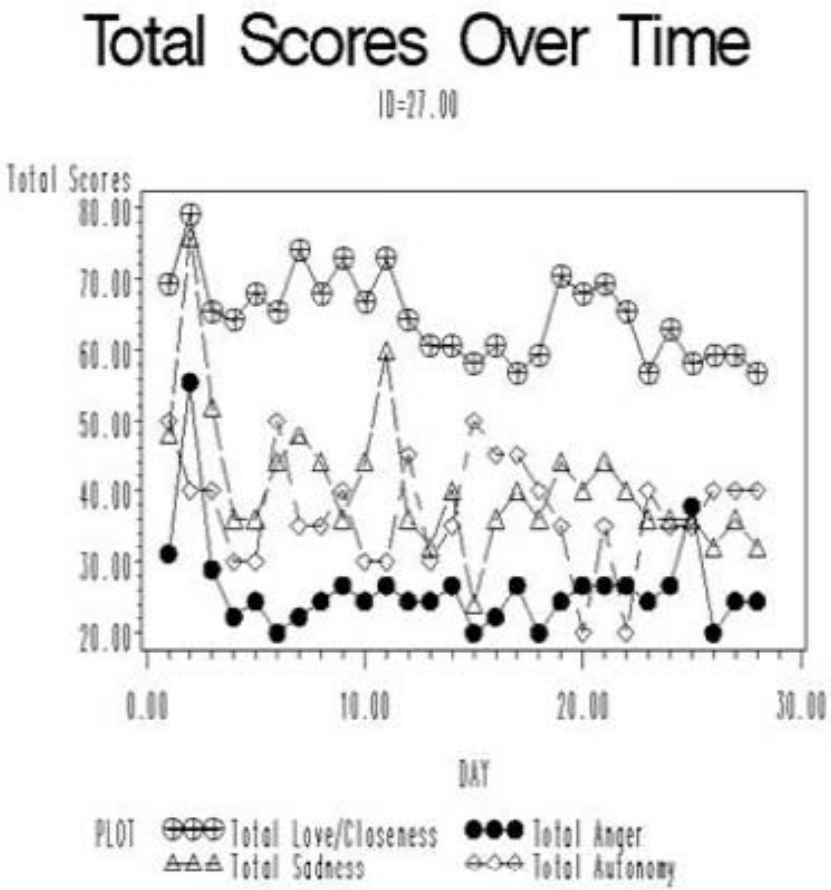
Z Score, Autonomy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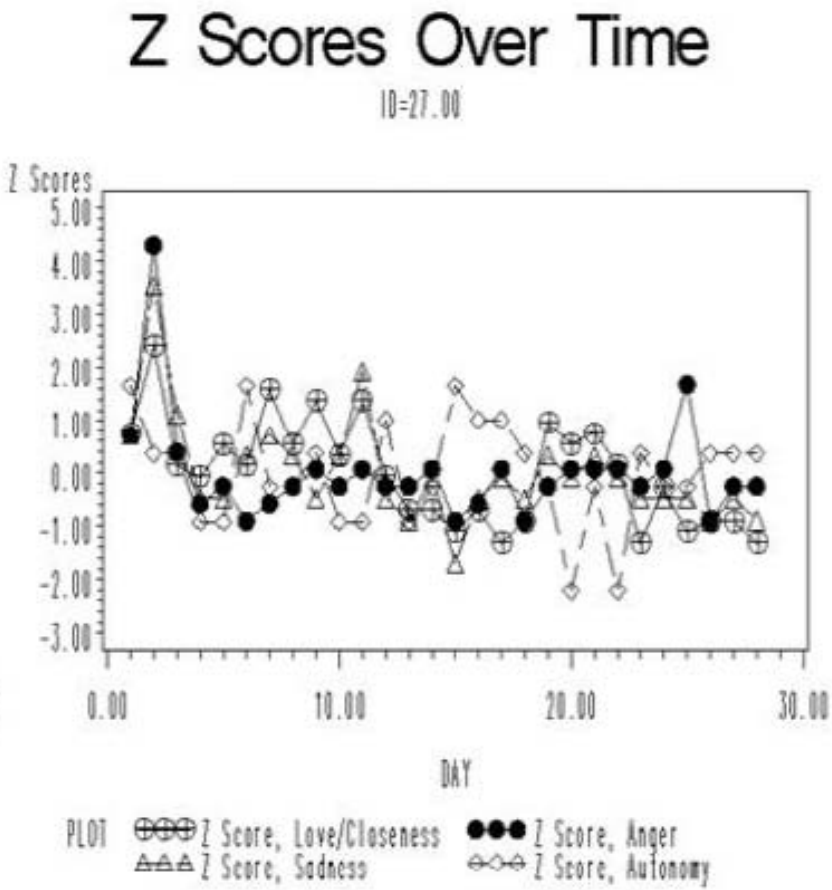
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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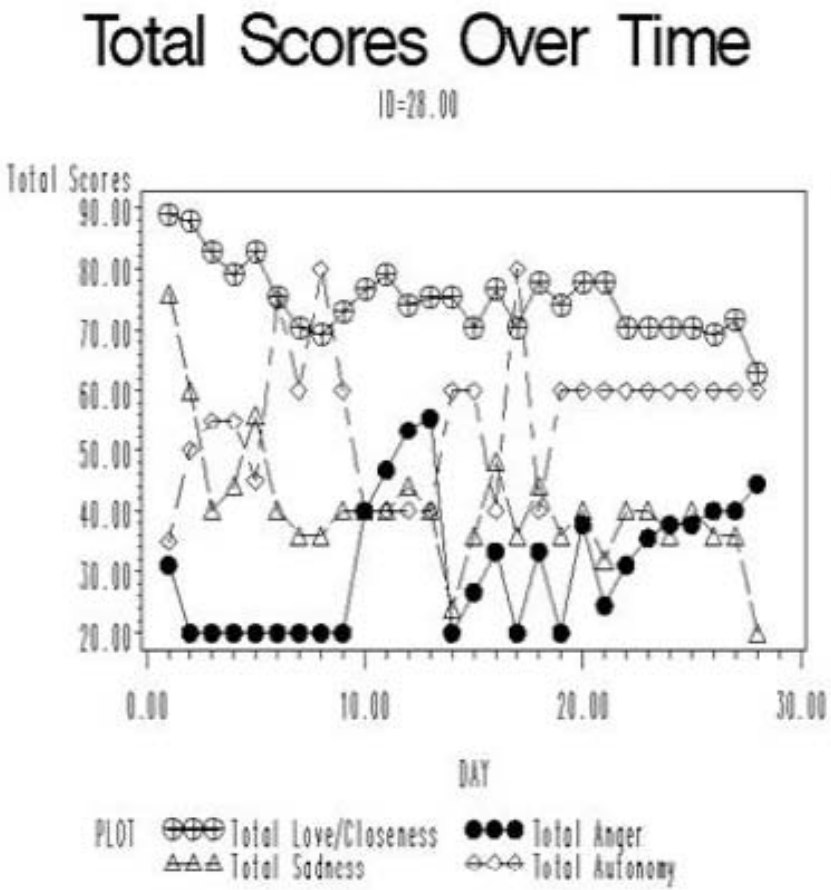
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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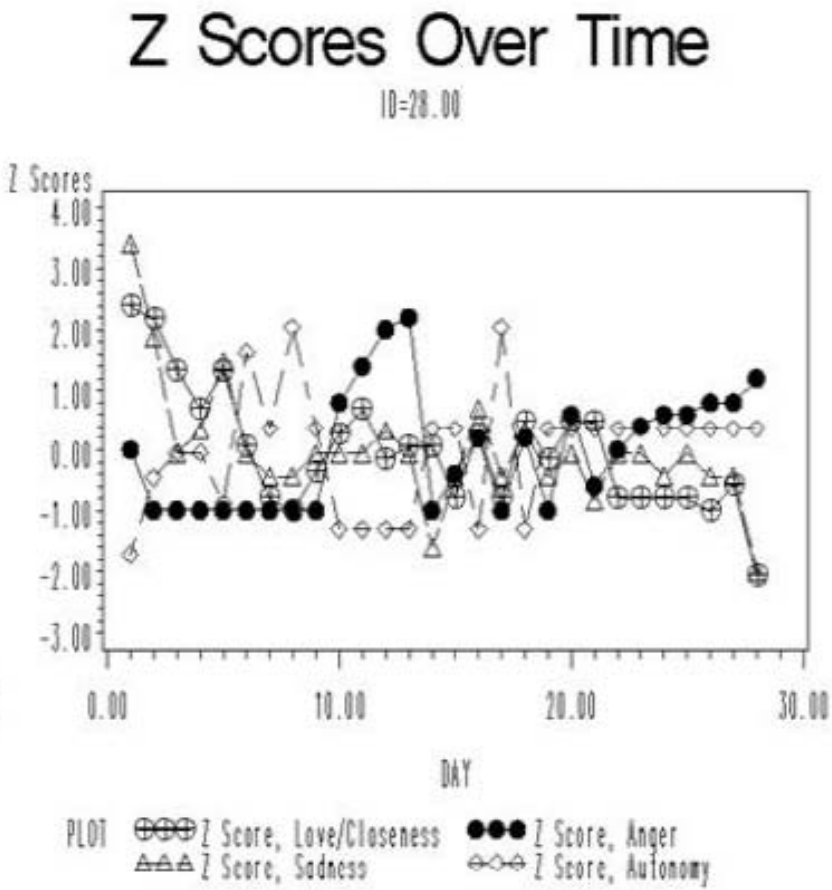
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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2.00
1.00
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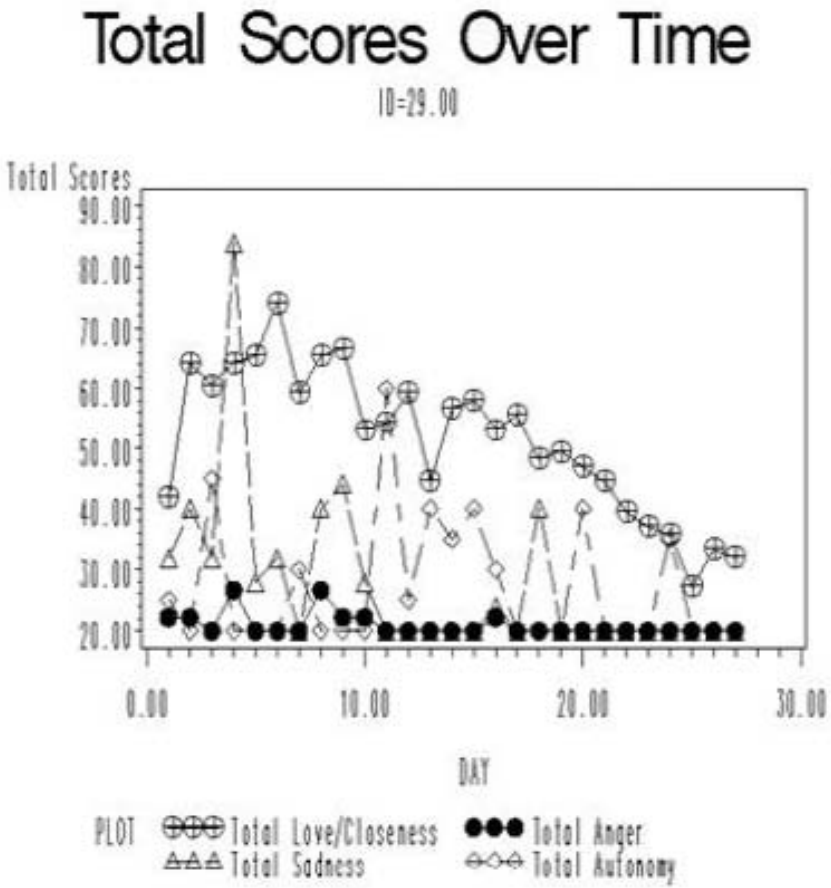
20.00
30.00
DAY
PLOT
Z Score, Love/Closeness
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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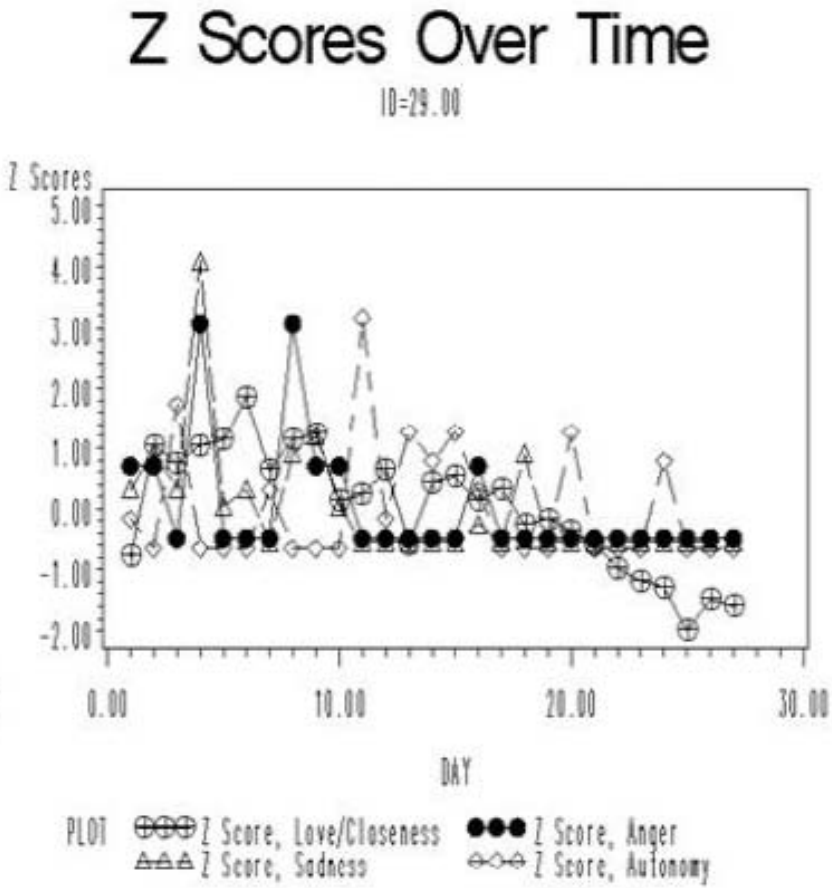
30.00
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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3.00
2.00
1.00
0.00
-1.00
-2.00
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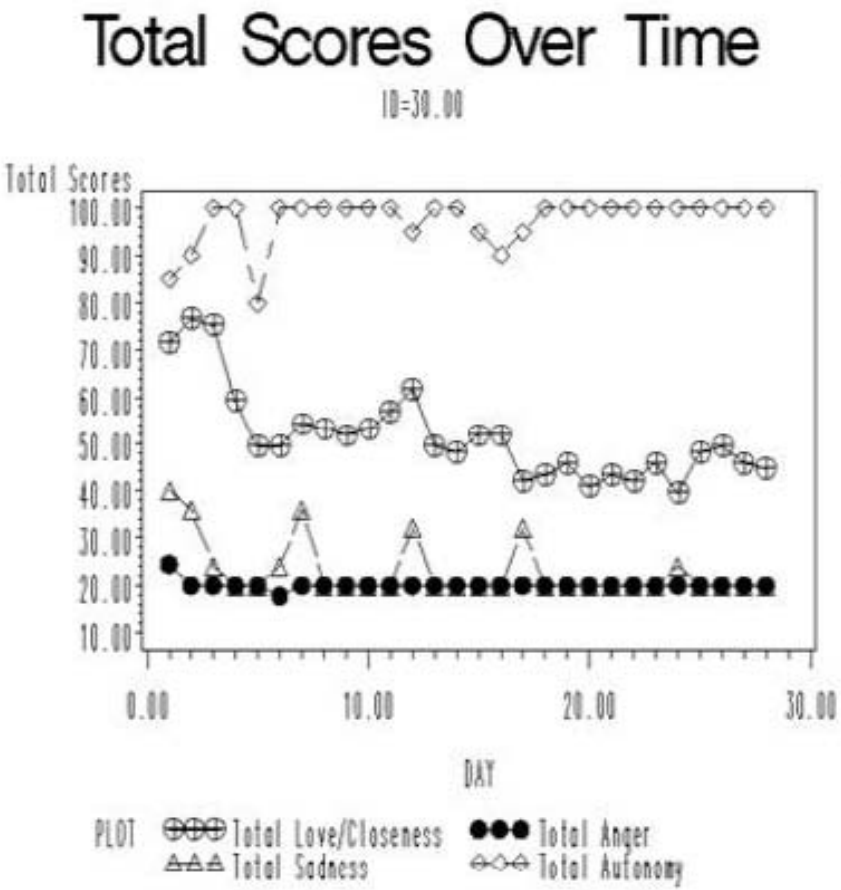
20.00
30.00
DAY
PLOT
Z Score, Love/Closeness
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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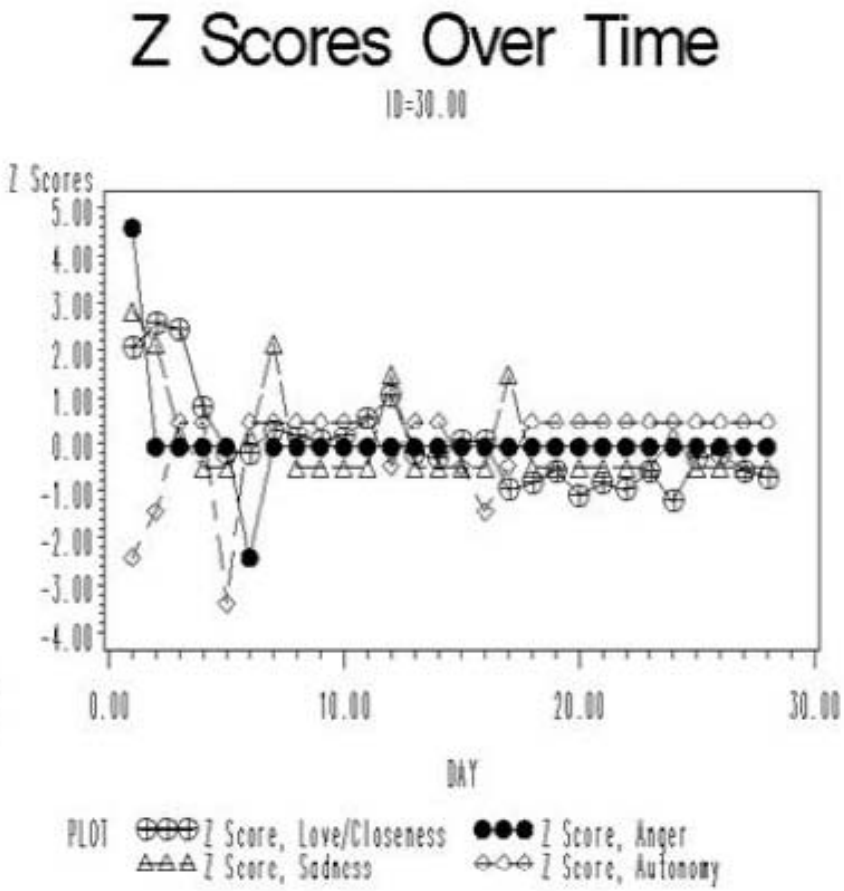
20.00
30.00
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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3.00
2.00
1.00
0.00
-1.00
-2.00
-3.00
-4.00
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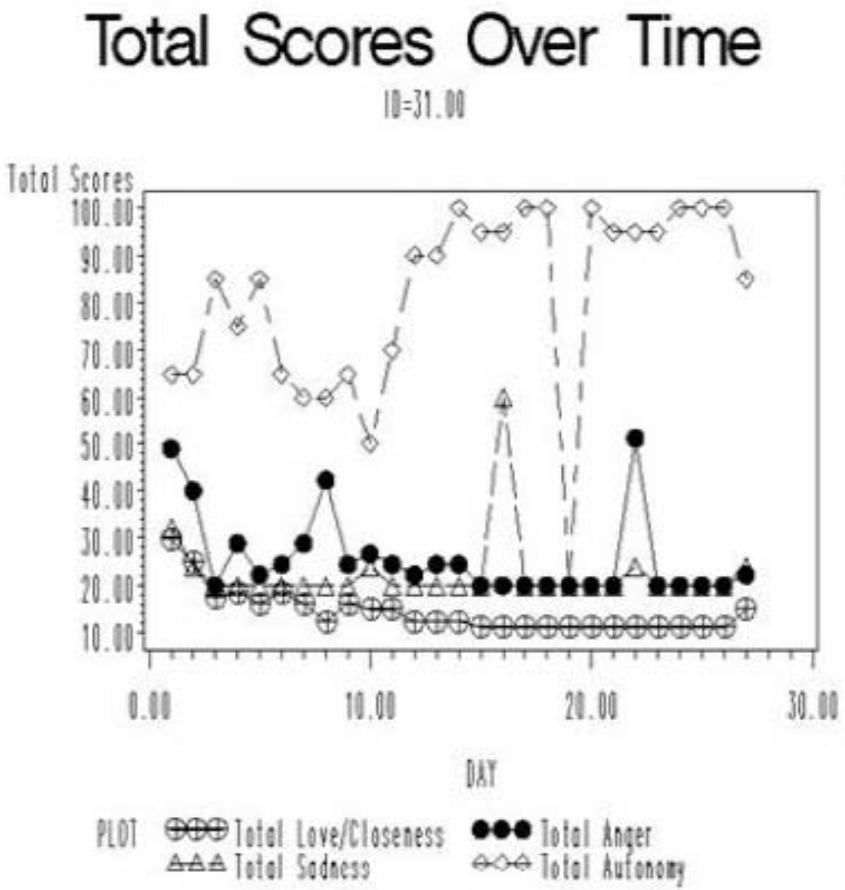
10.00
20.00
30.00
DAY
PLOT
Z Score, Love/Closeness
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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DAY
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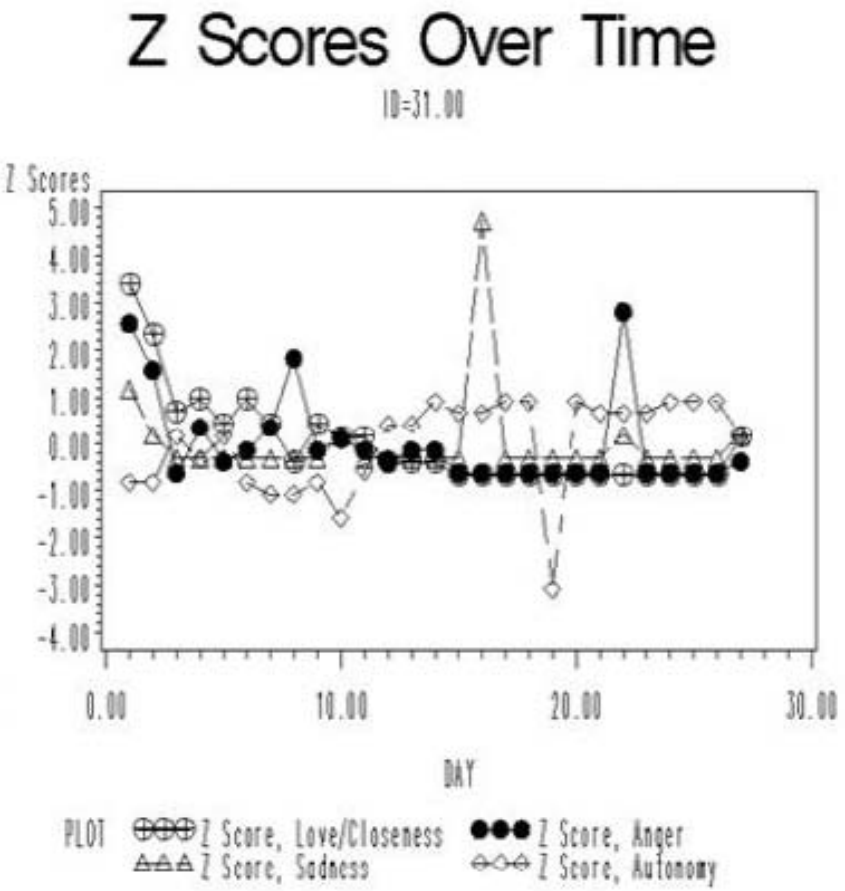
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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20.00
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DAY
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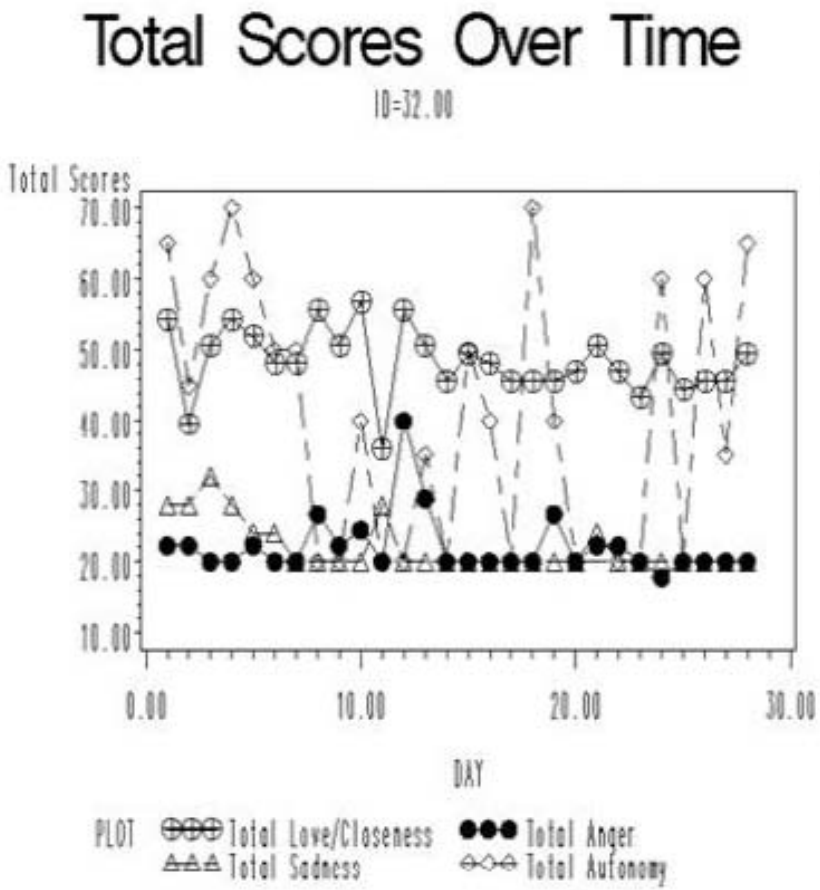
Z Score, Autonomy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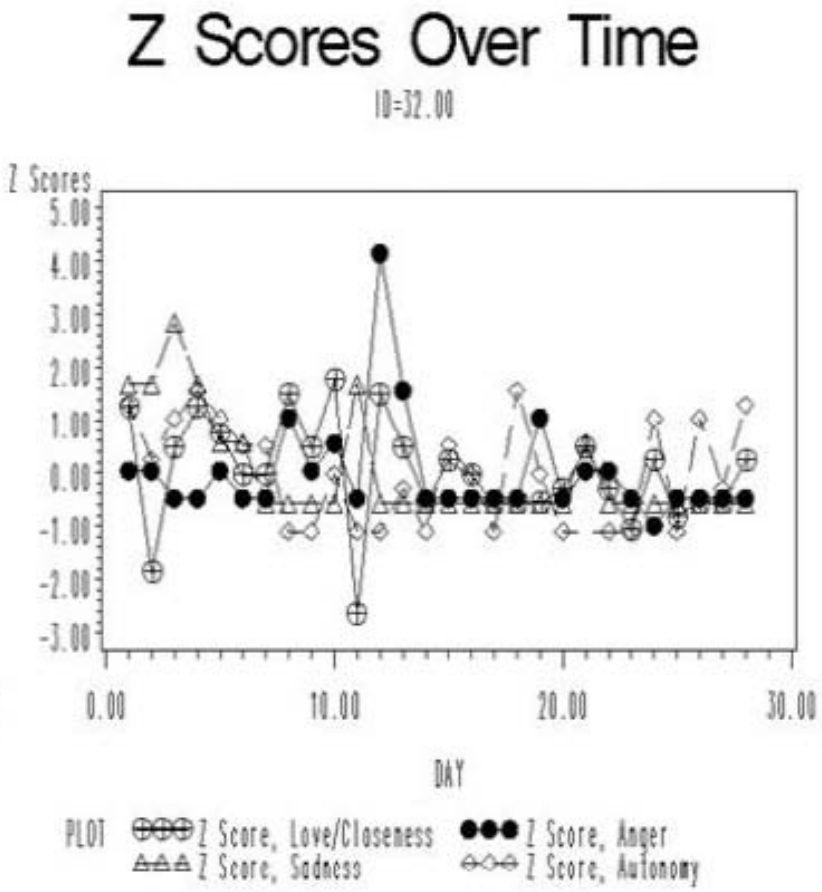
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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-3.00
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20.00
30.00
DAY
PLOT
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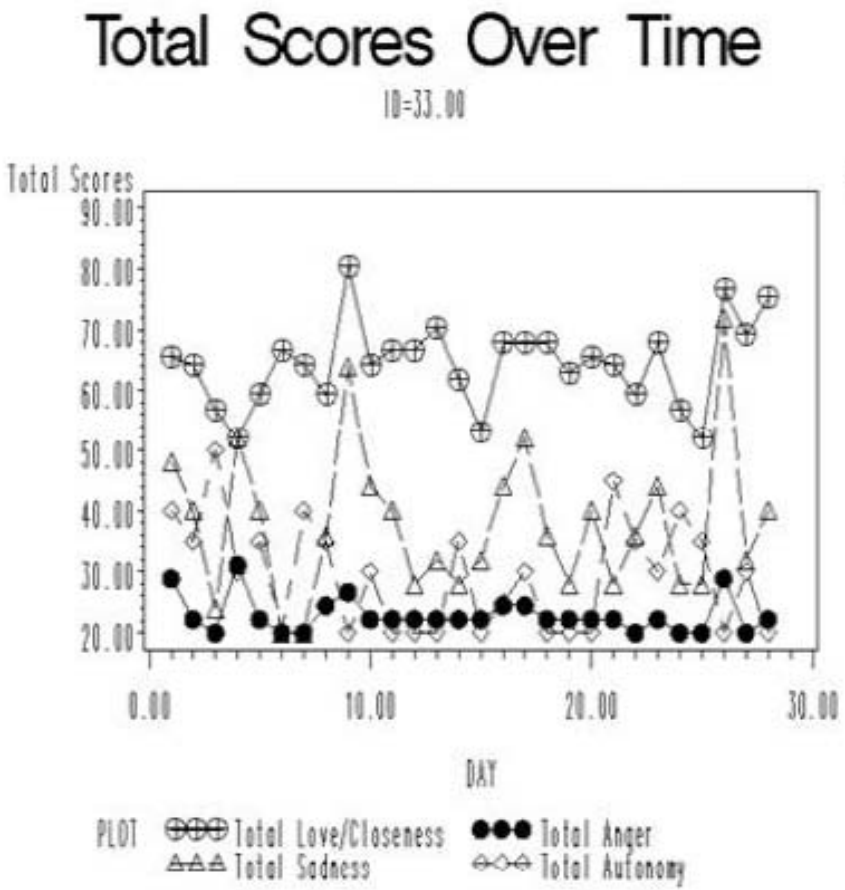
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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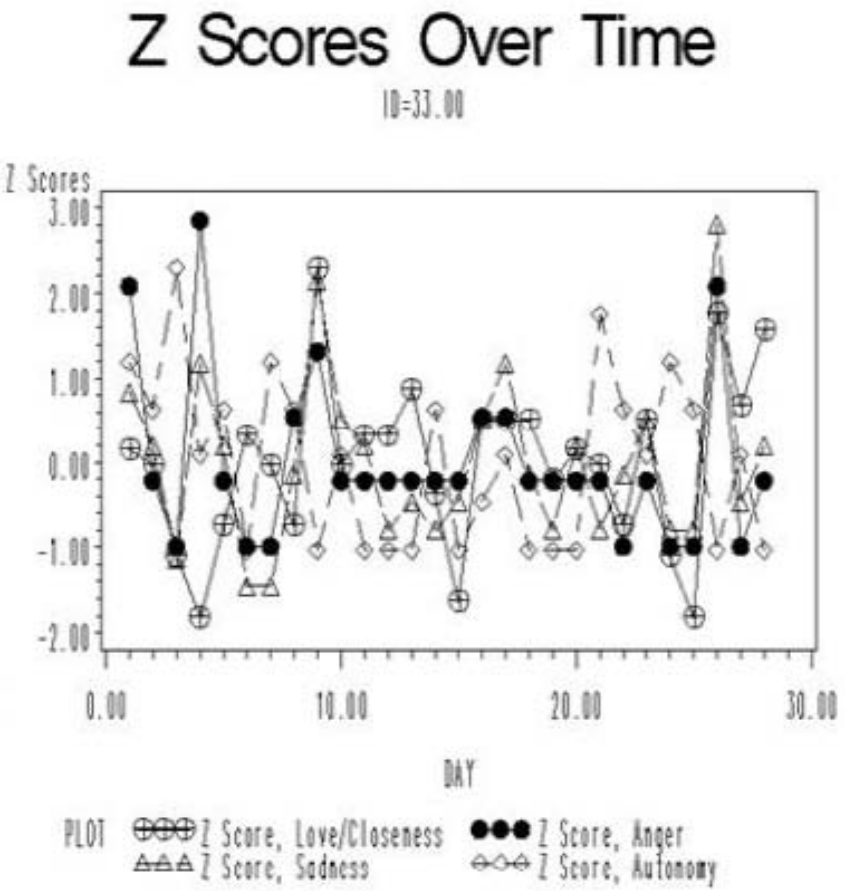
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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Z Score, Anger
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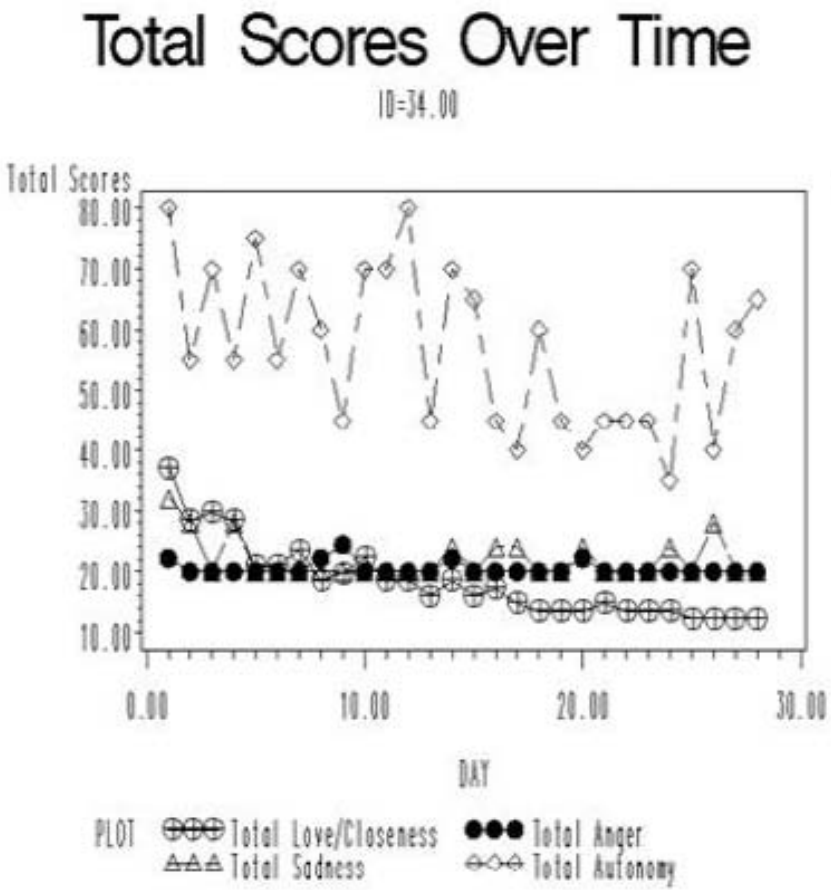
Z Score, Autonomy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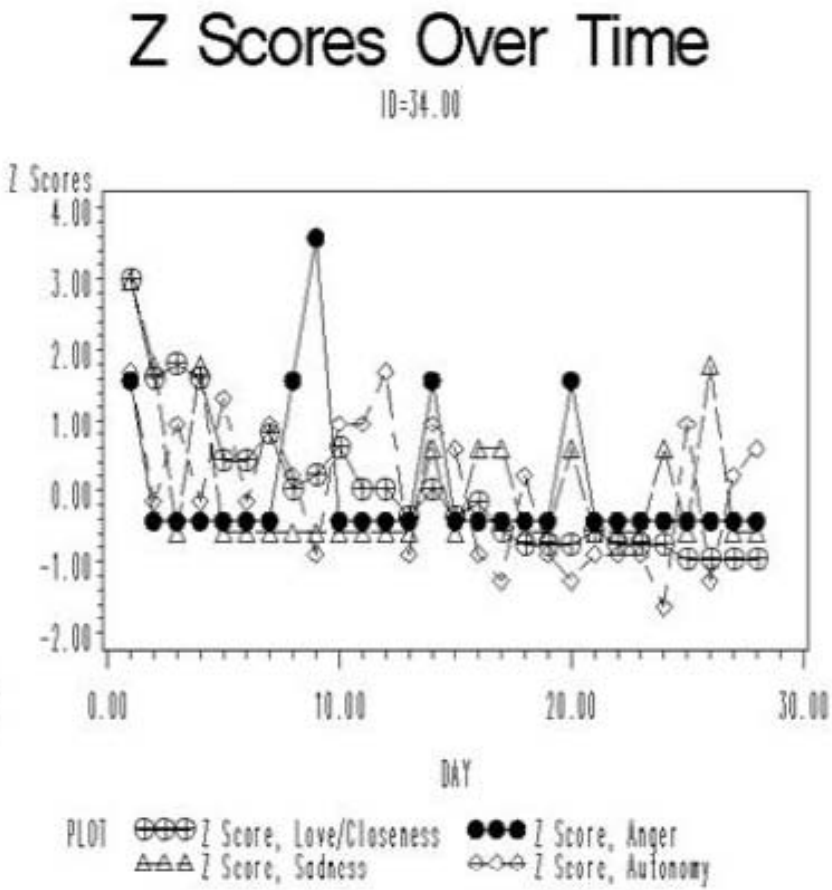
Total Anger
Total Sadness
Total Autonomy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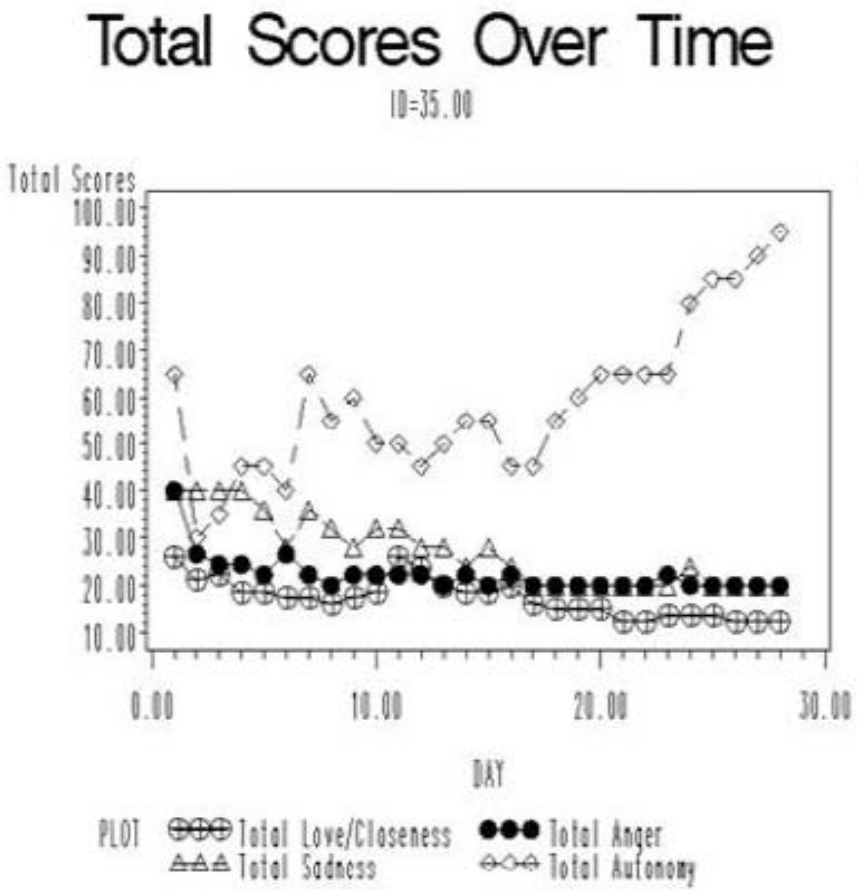
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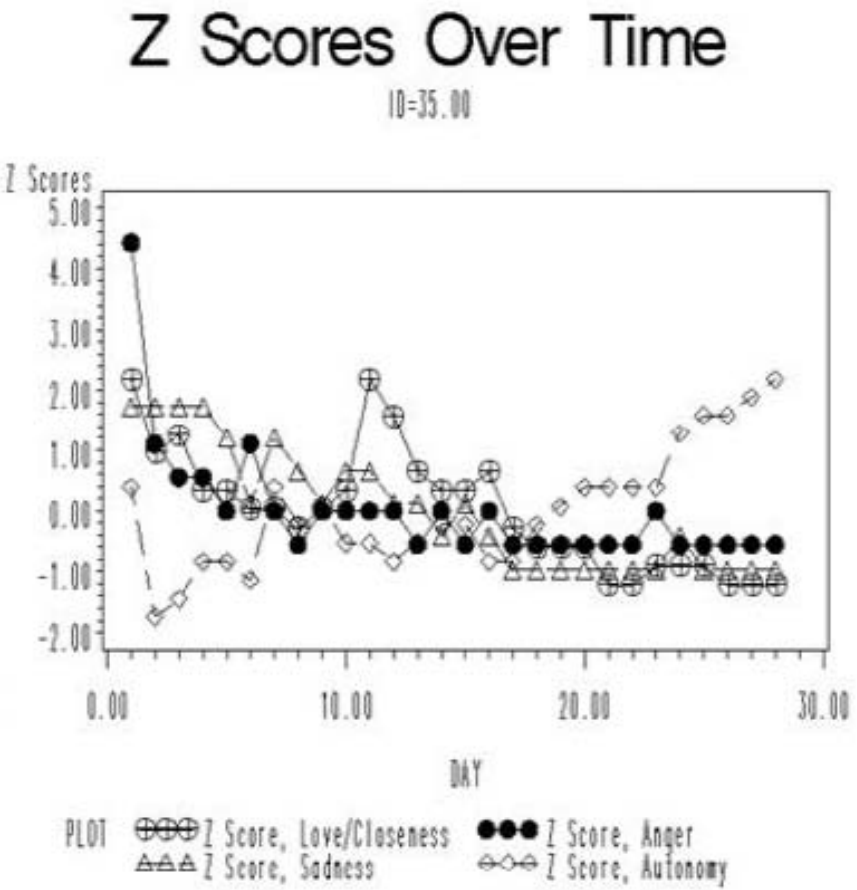
Total Anger
Total Sadness
Total Autonomy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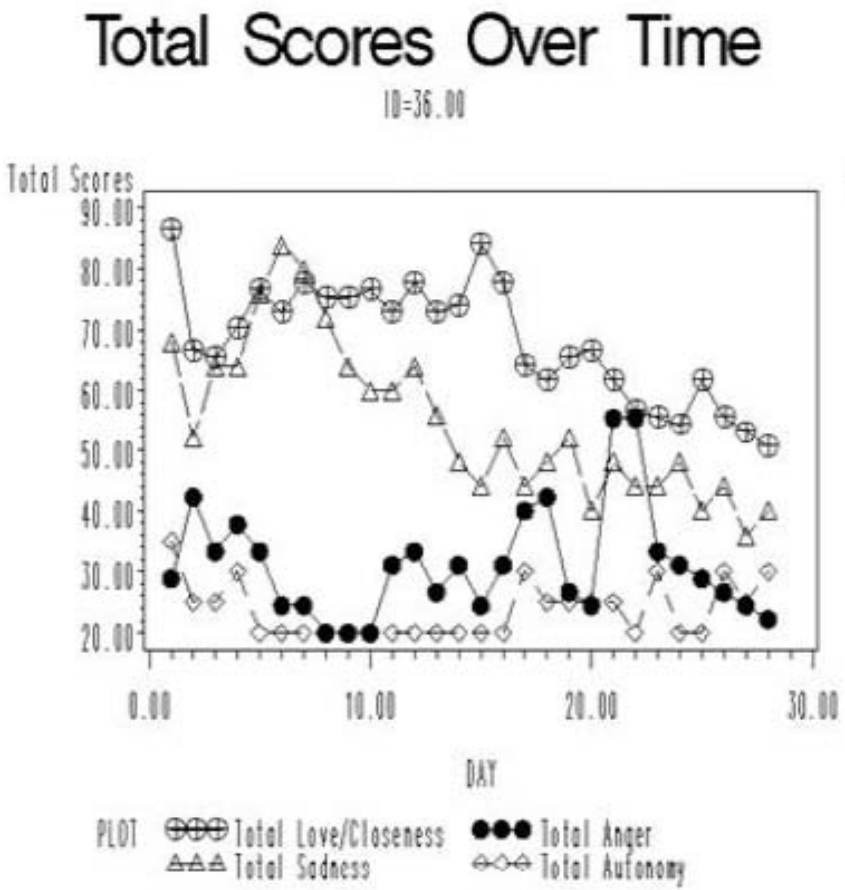
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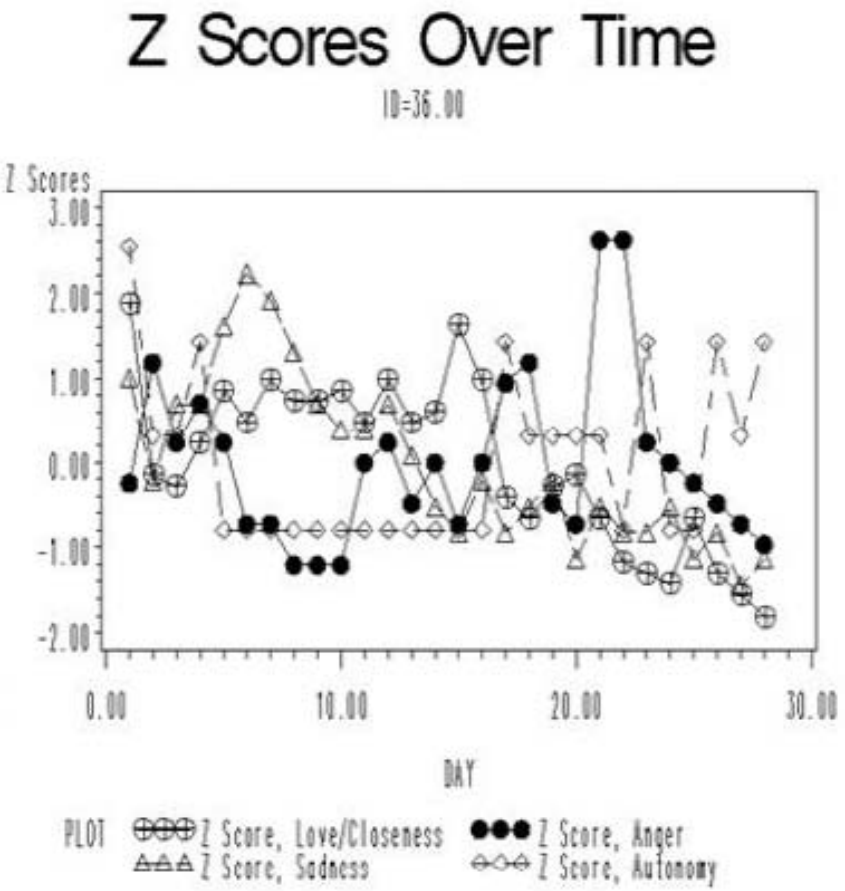
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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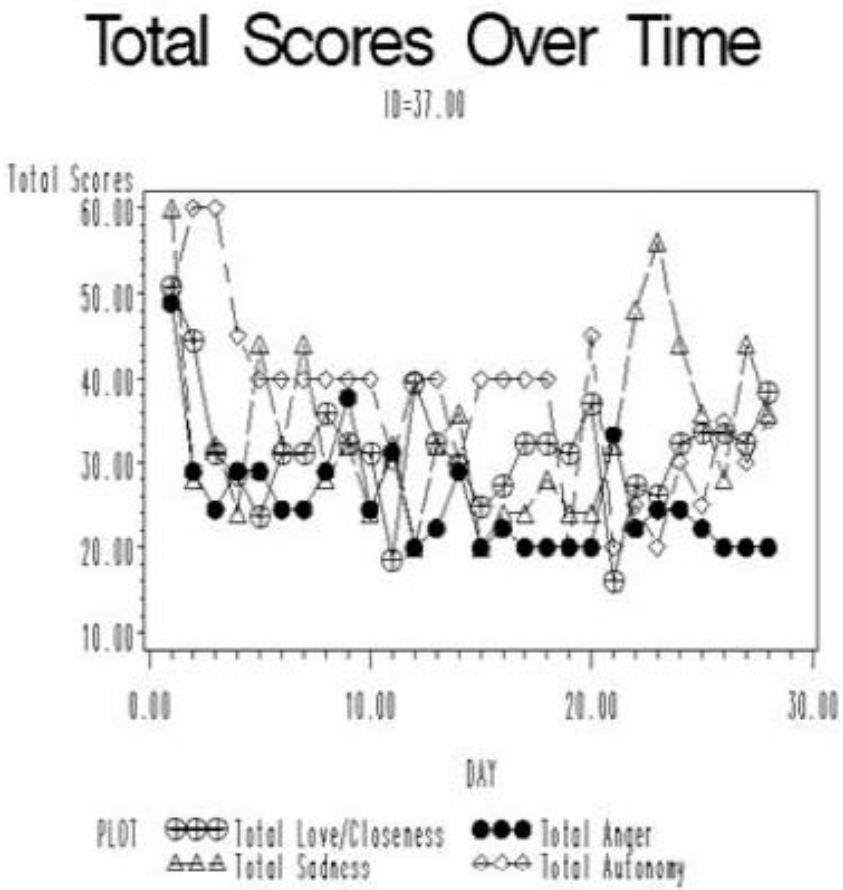
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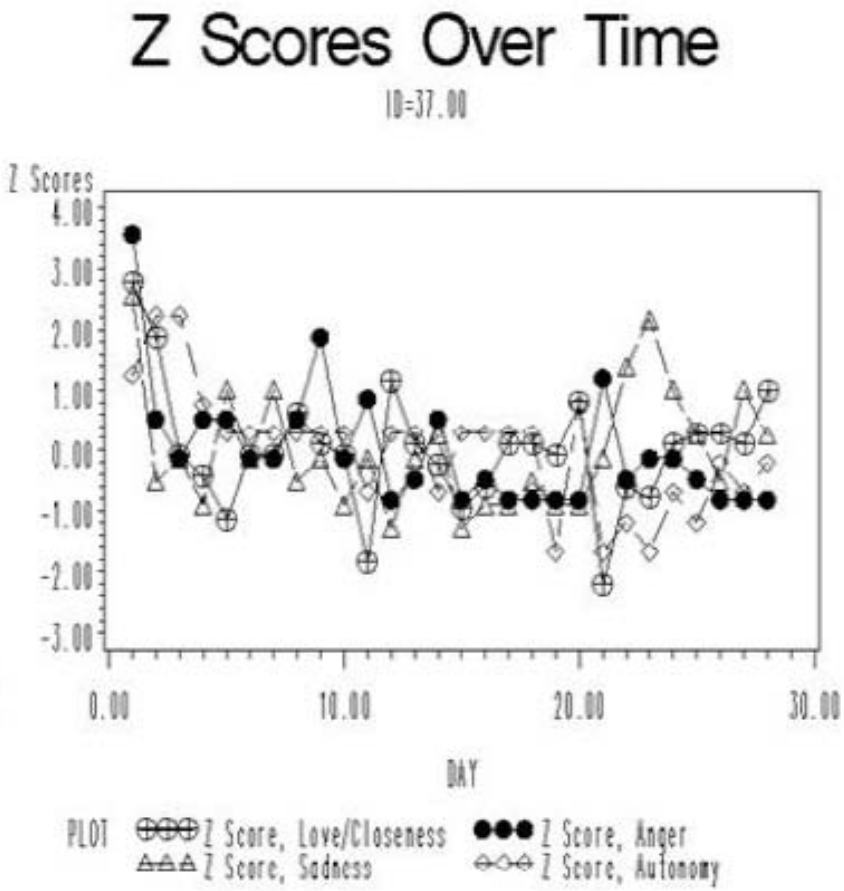
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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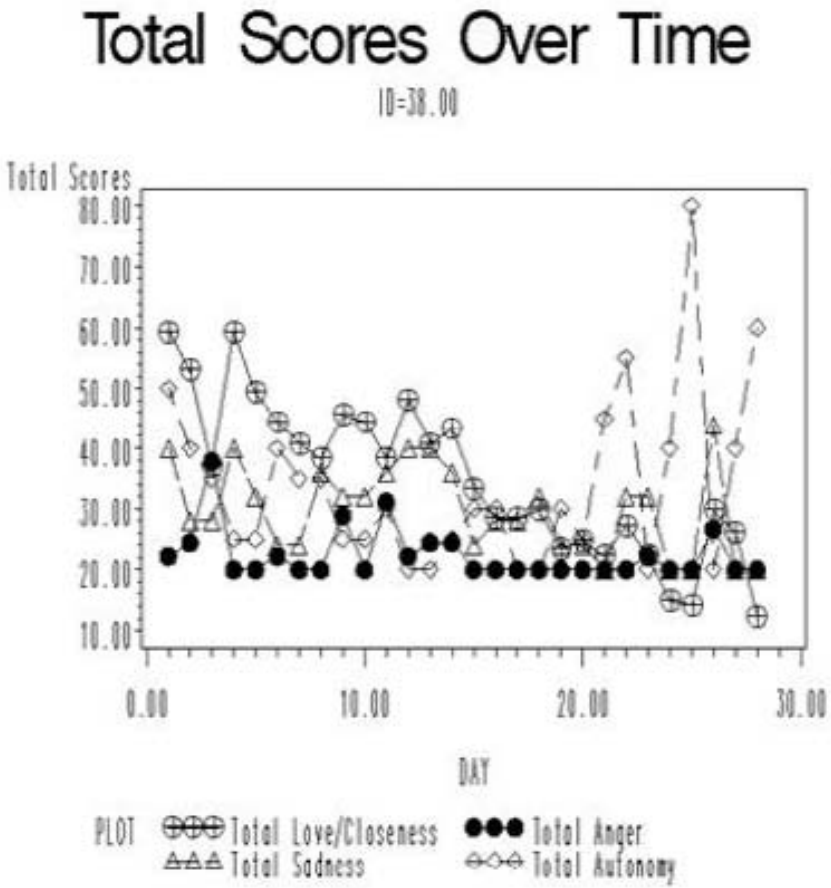
DAY
PLOT
Z Score, Love/Closeness
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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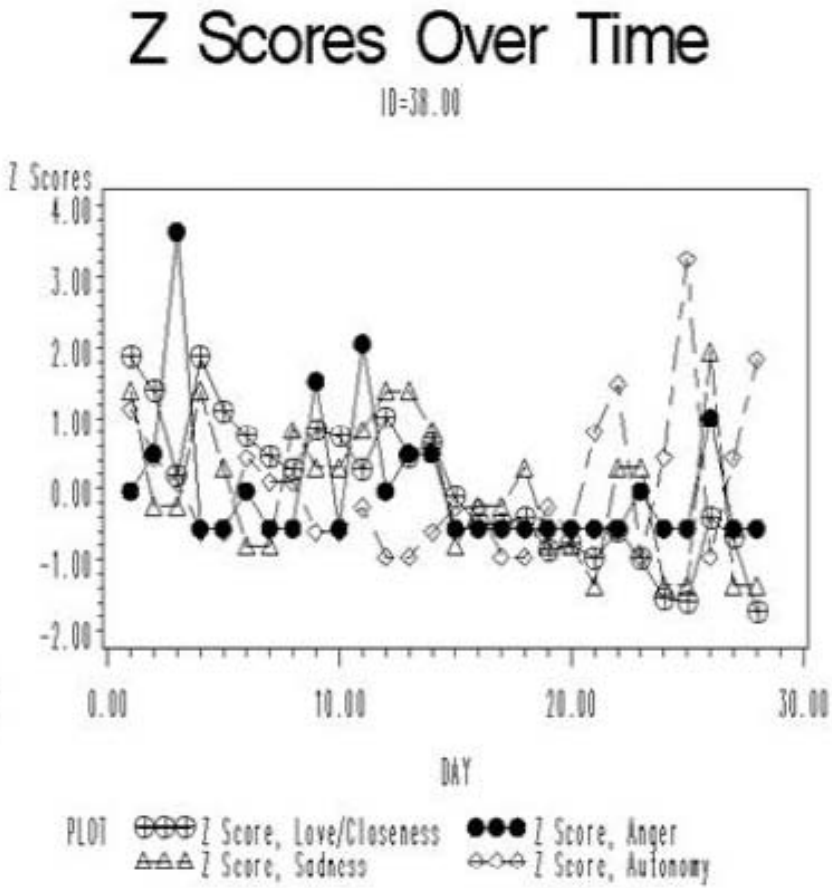
Total Anger
Total Sadness
Total Autonomy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PLOT
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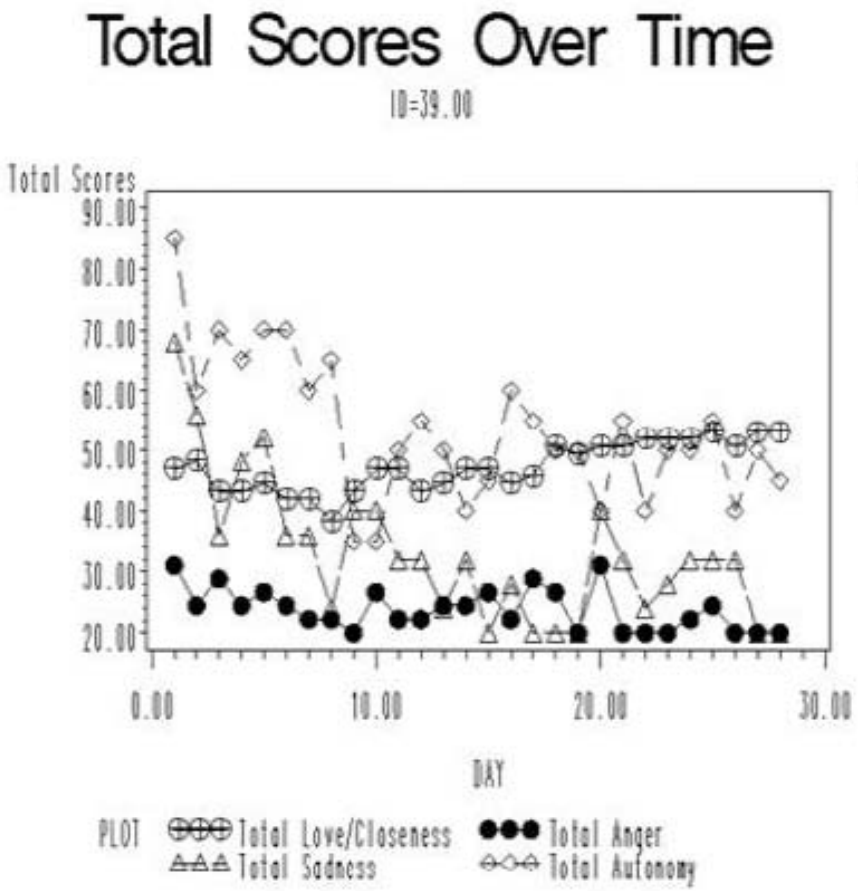
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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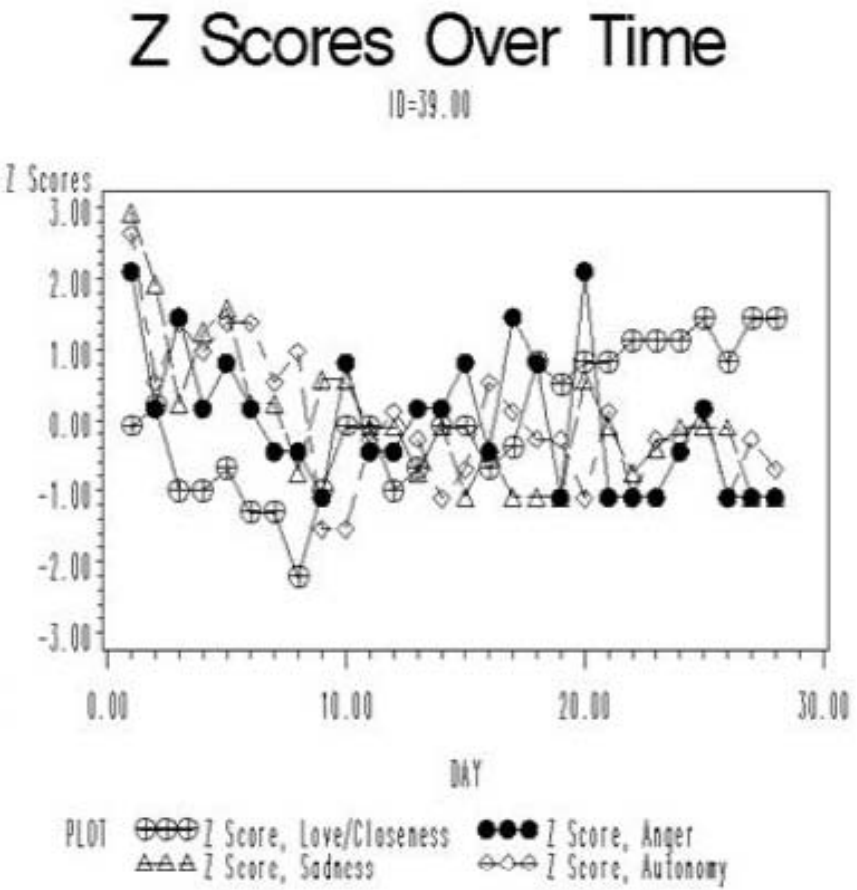
Total Sadness
Total Autonomy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Z Score, Anger
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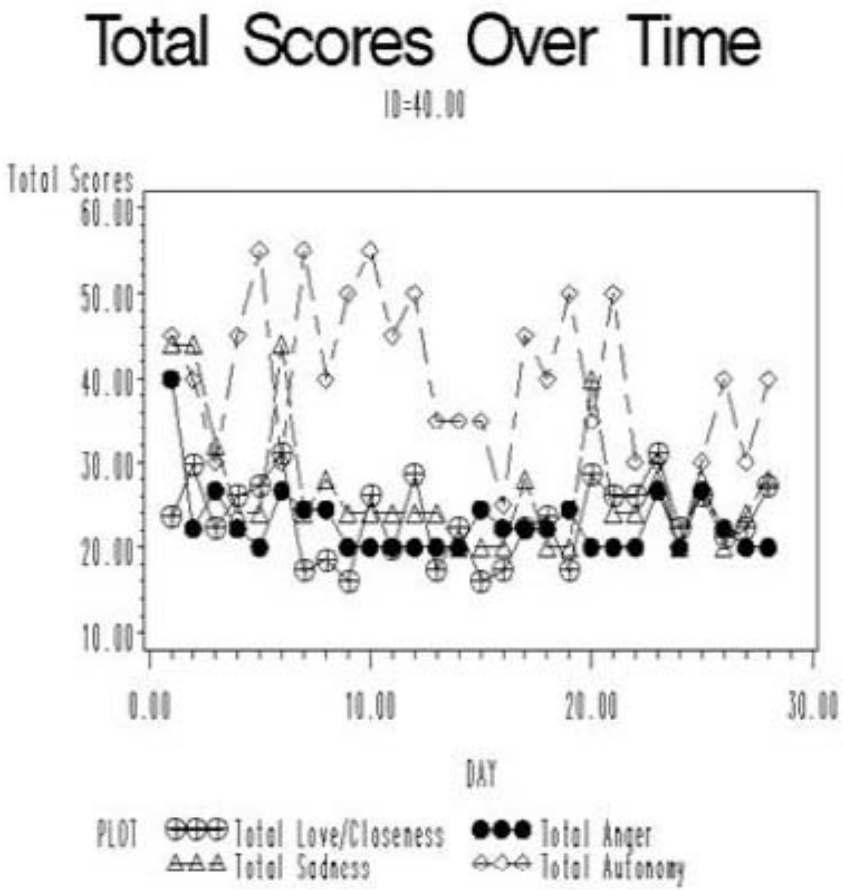
Z Score, Autonomy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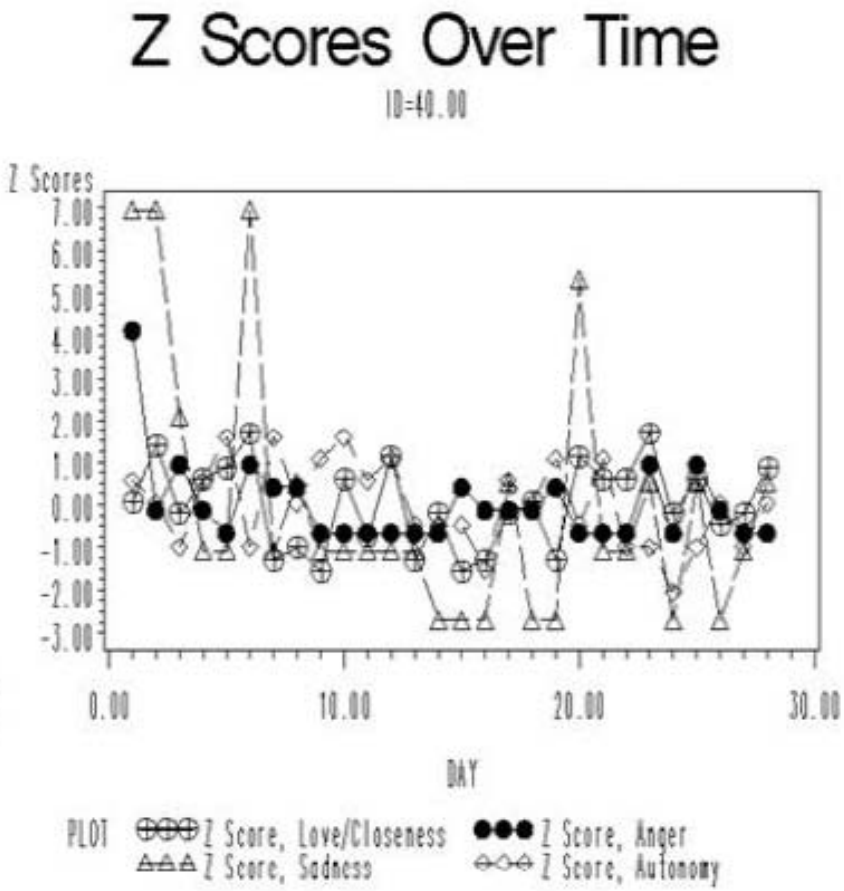
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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DAY
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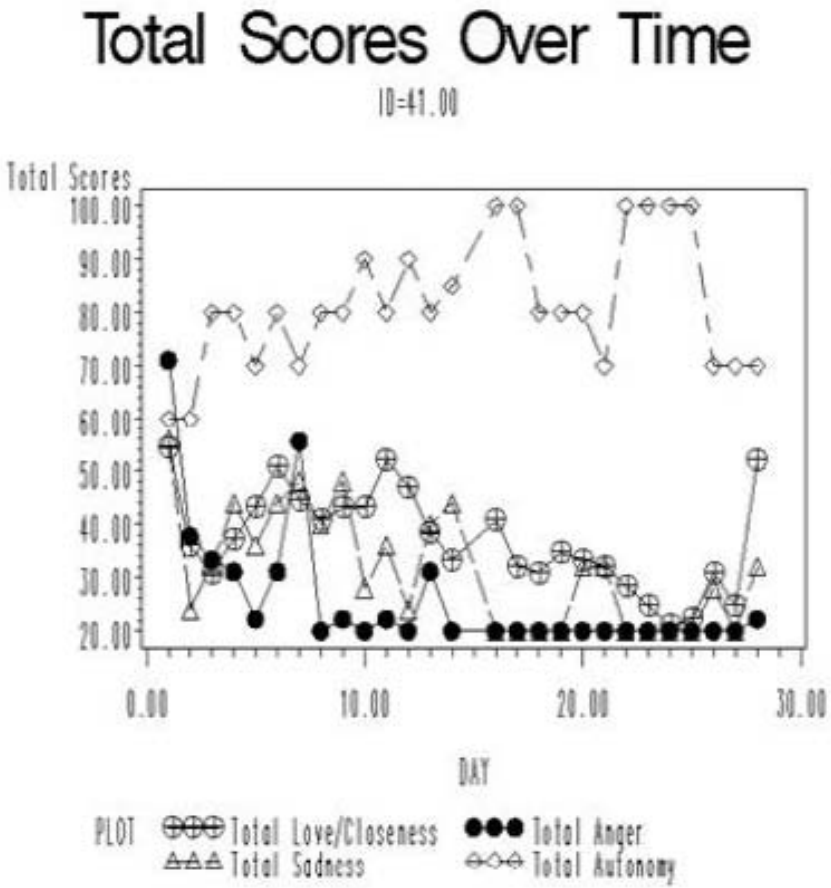
Z Score, Anger
Z Score, Sadness
Z Score, Autonomy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DAY
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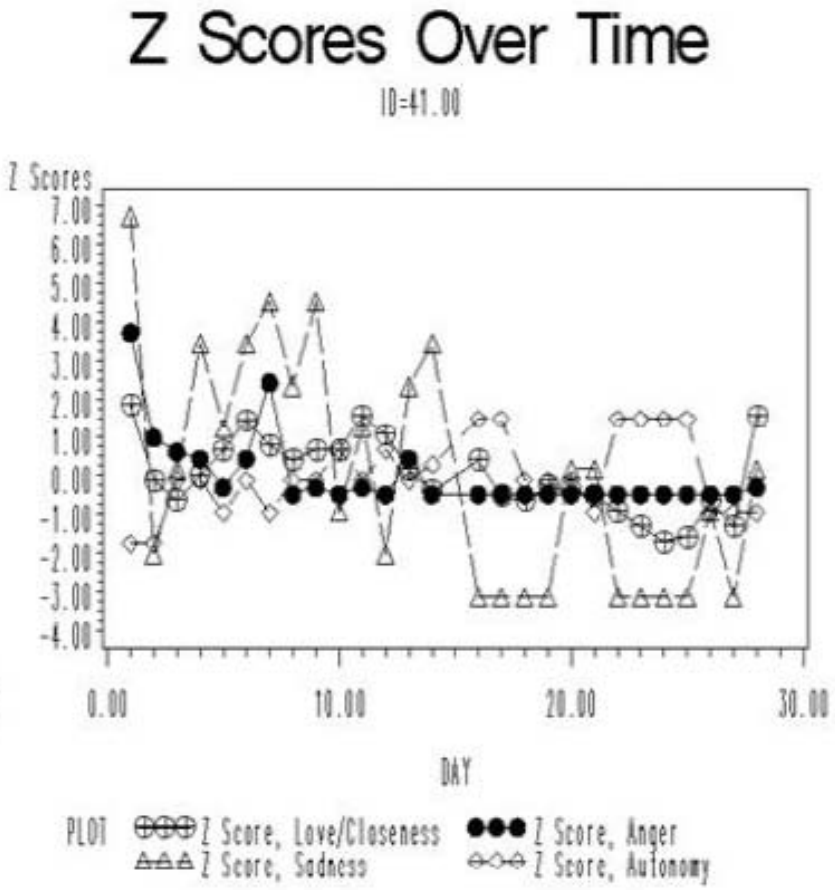
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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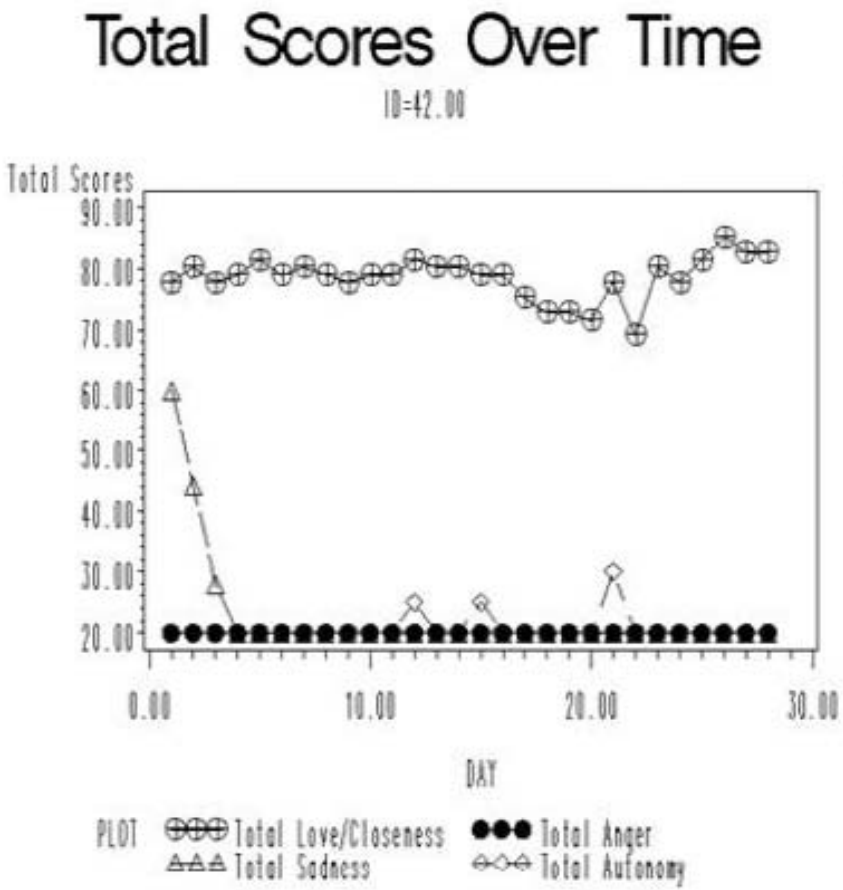
Z Score, Autonomy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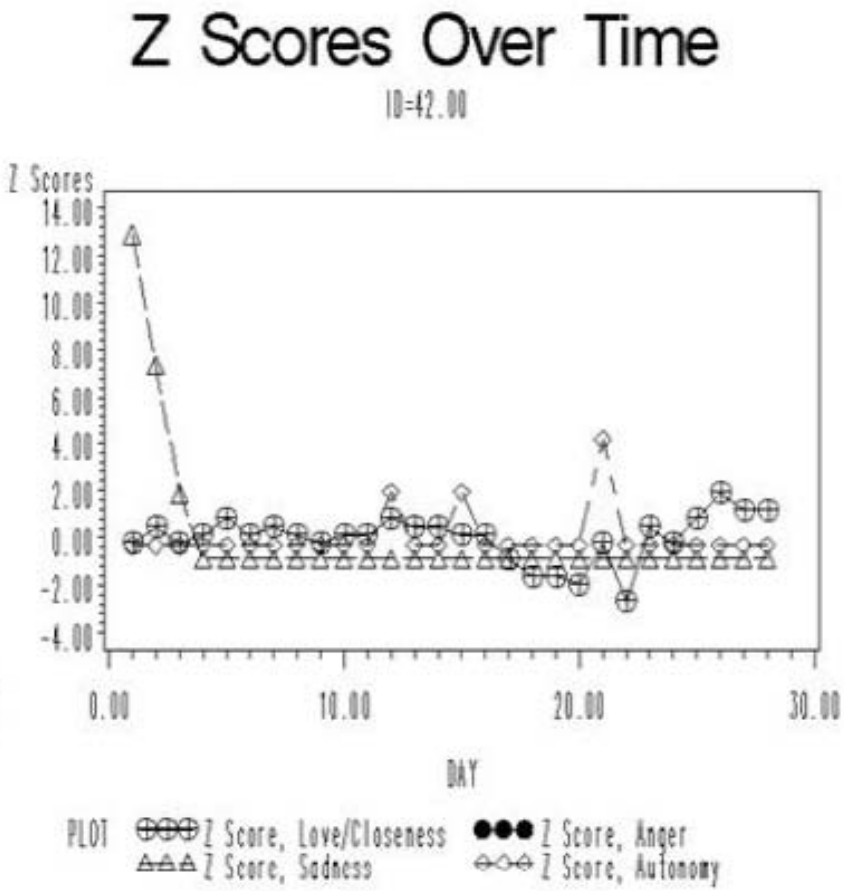
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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Z Score, Anger
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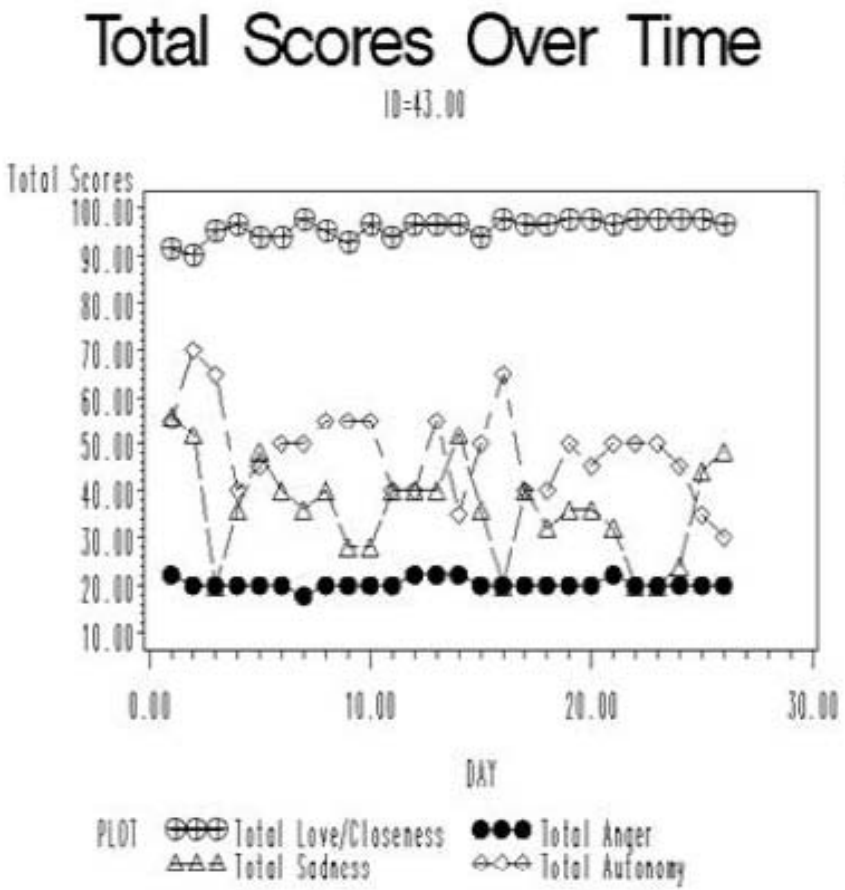
Z Score, Autonomy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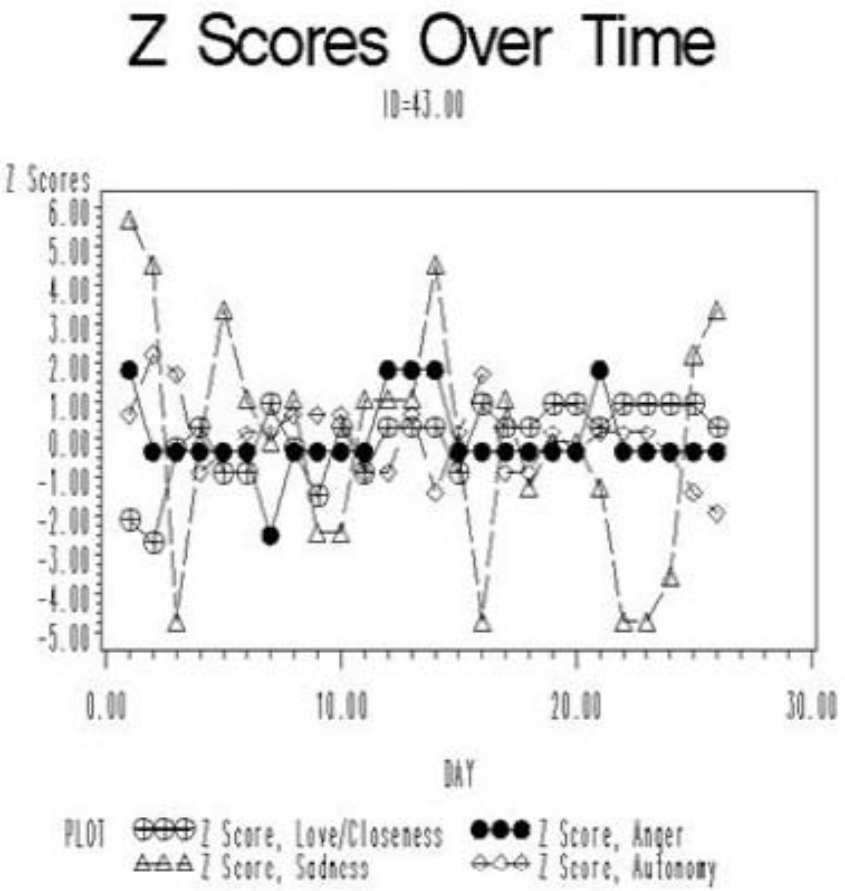
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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-2.00
-3.00
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DAY
PLOT
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Z Score, Anger
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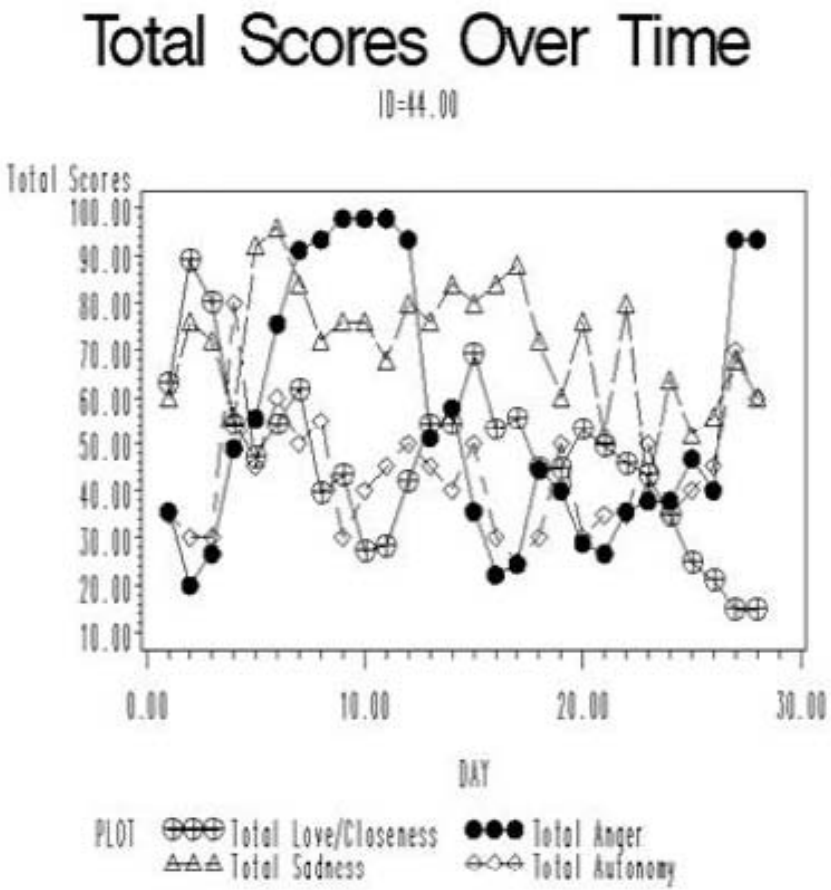
Z Score, Autonomy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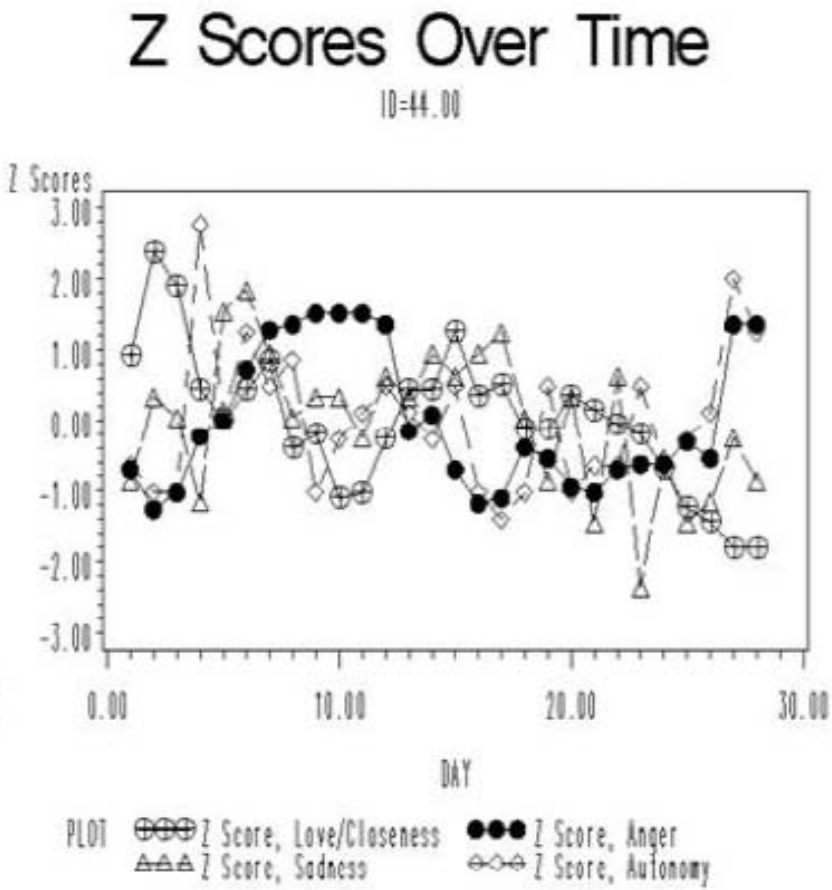
DAY
PLOT
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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DAY
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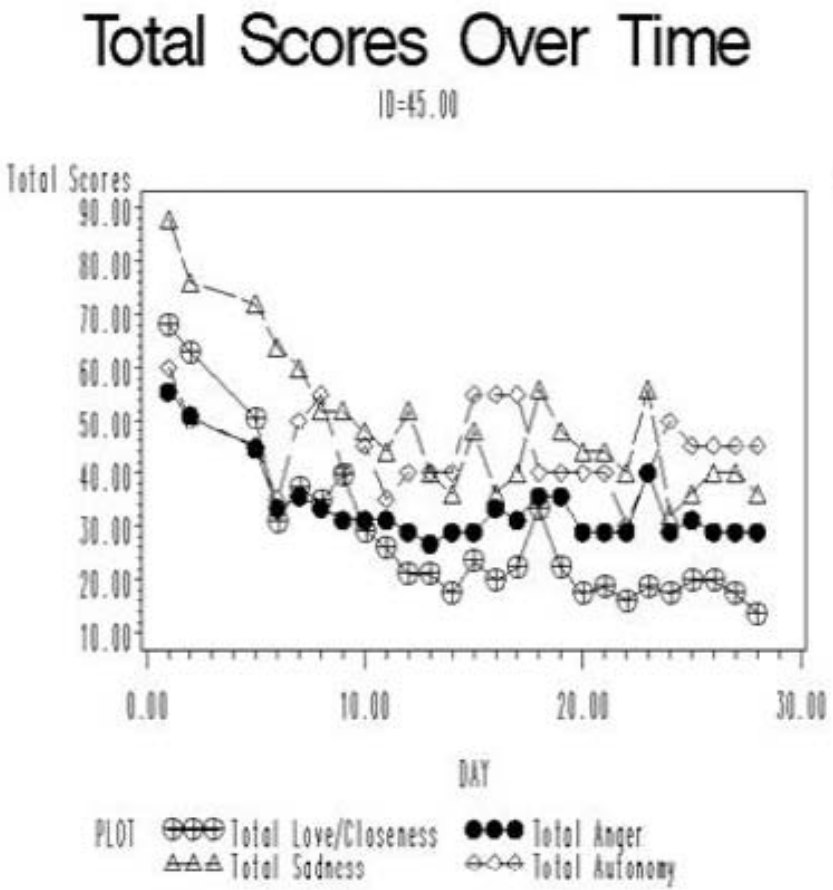
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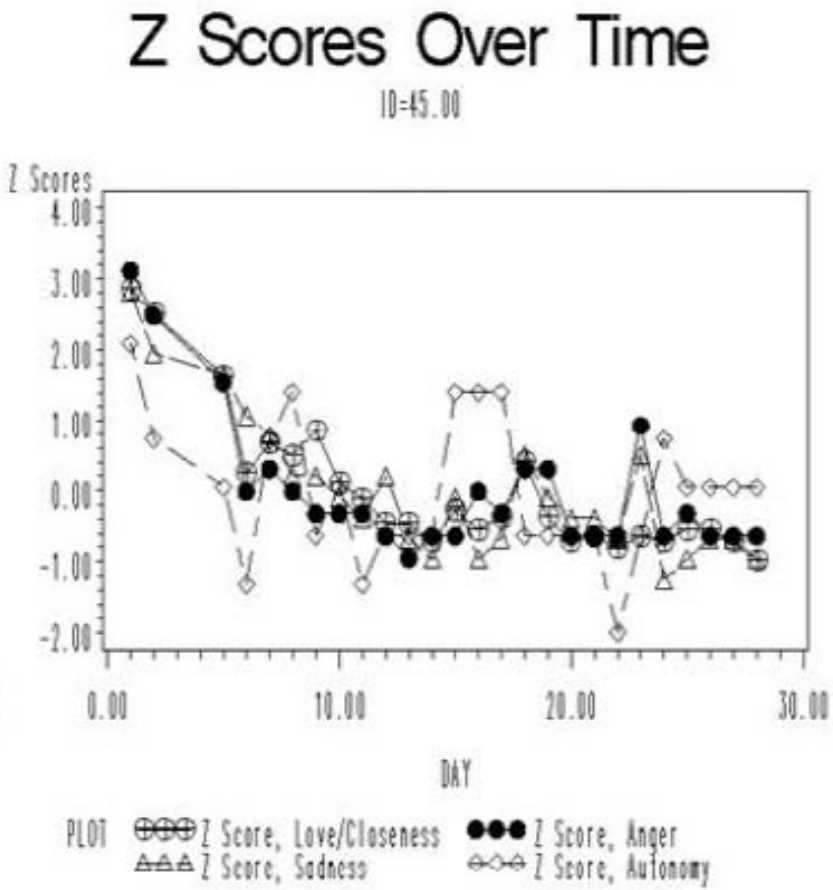
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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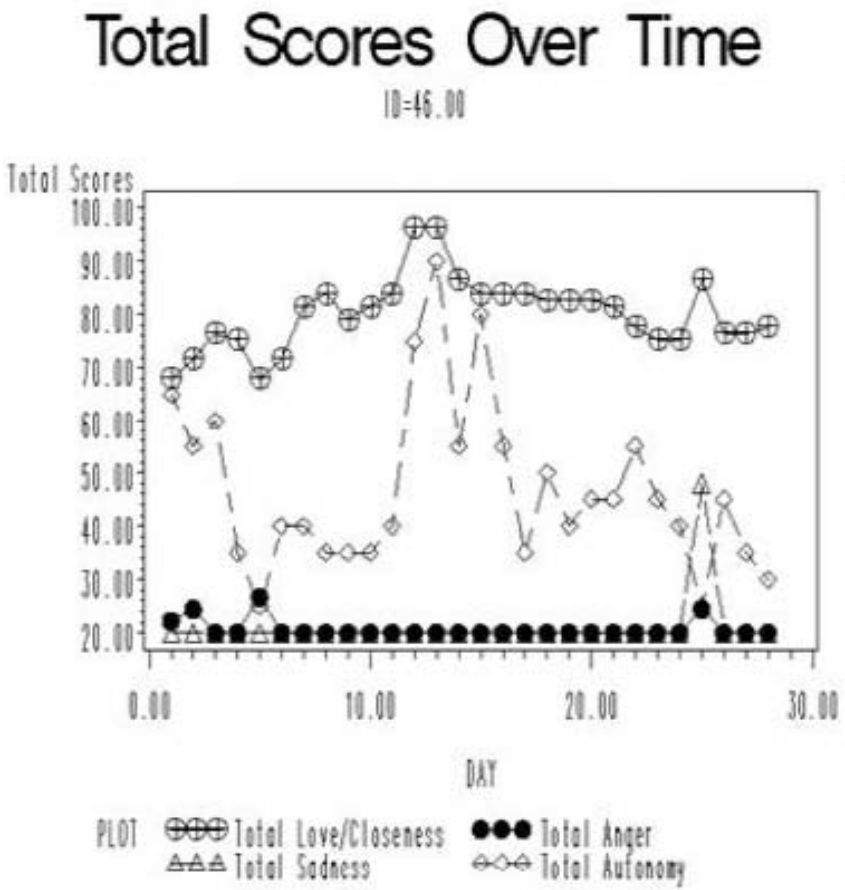
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Total Anger
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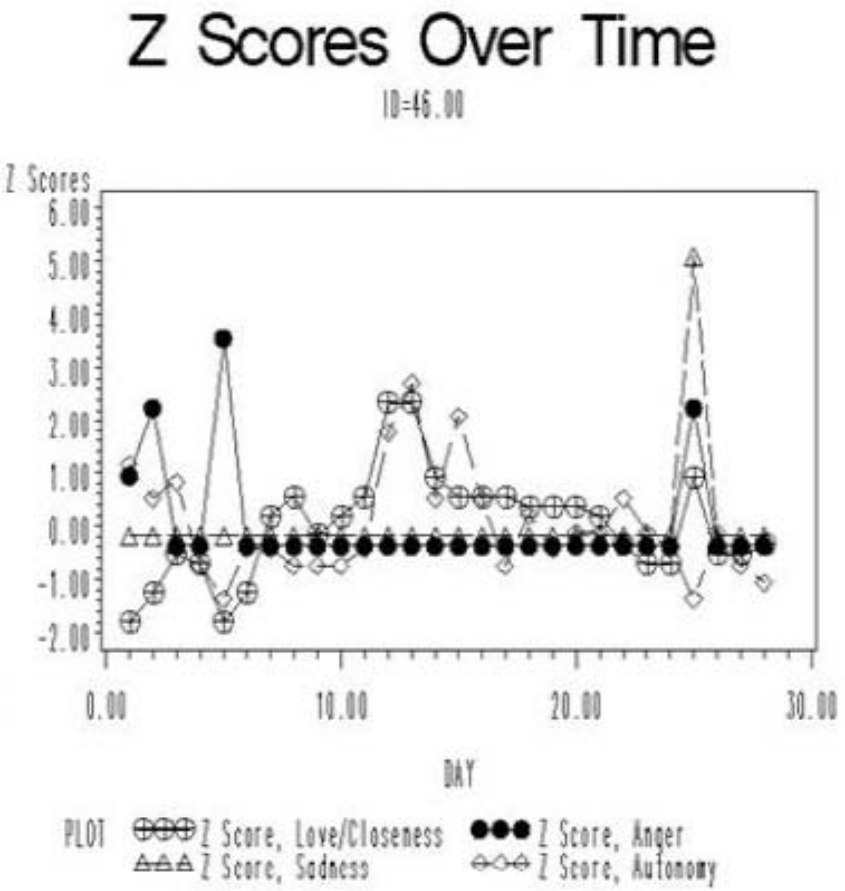
Total Autonomy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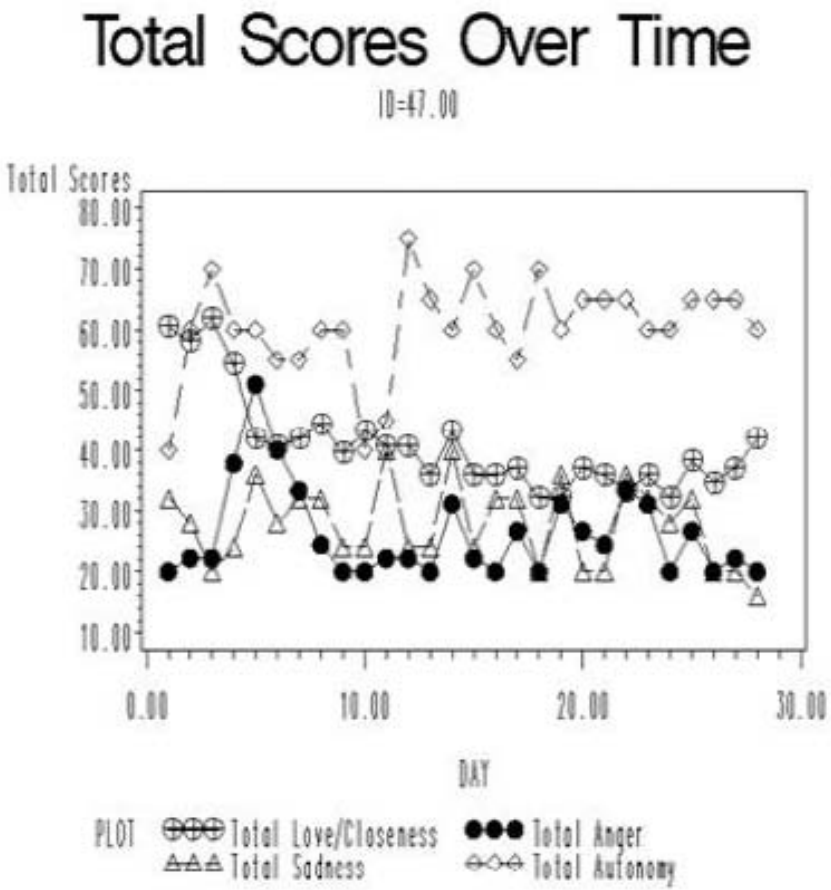
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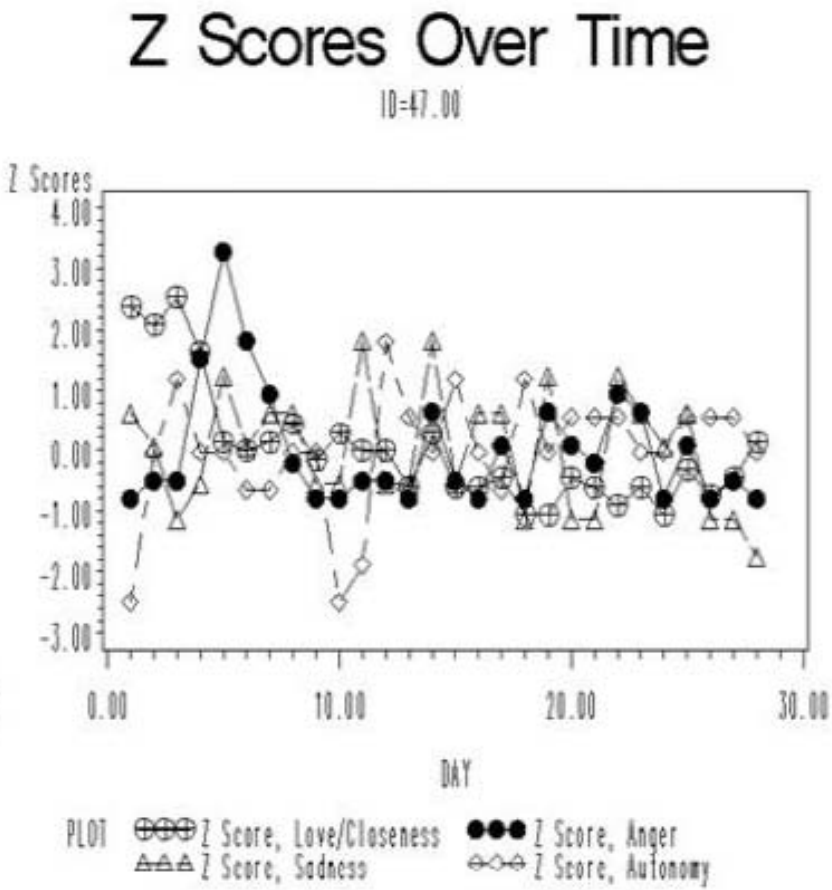
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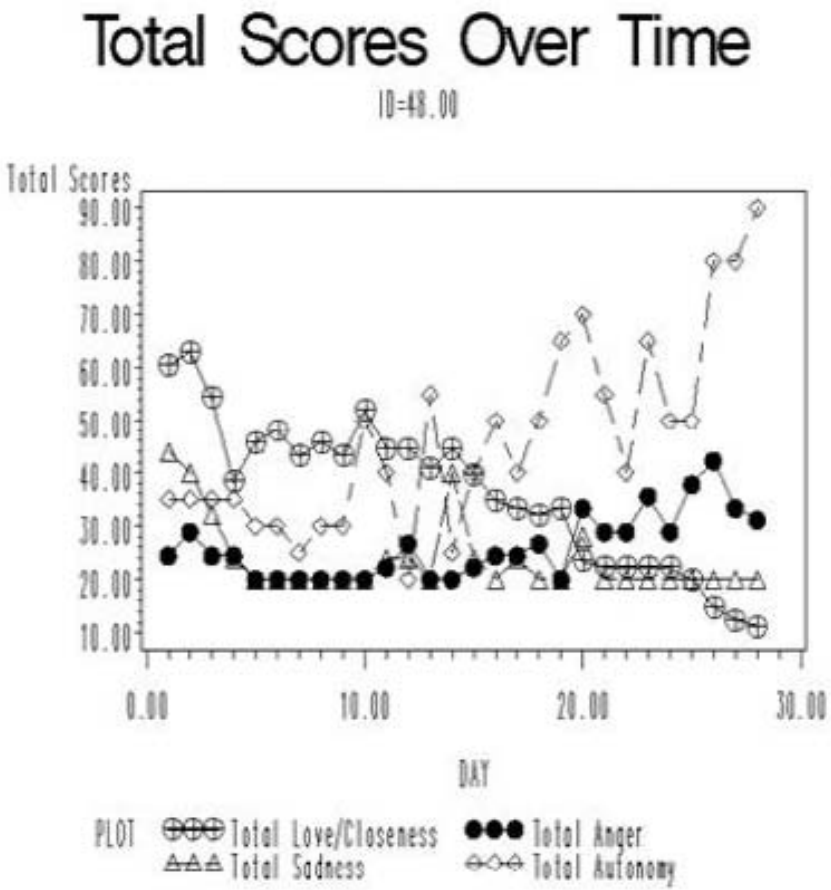
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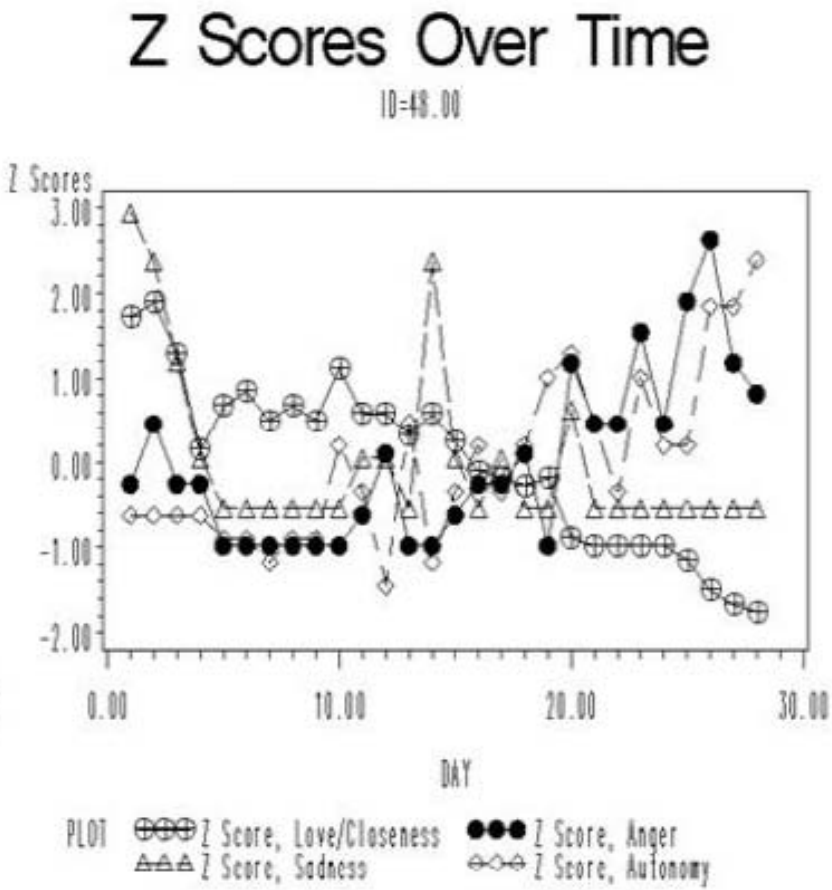
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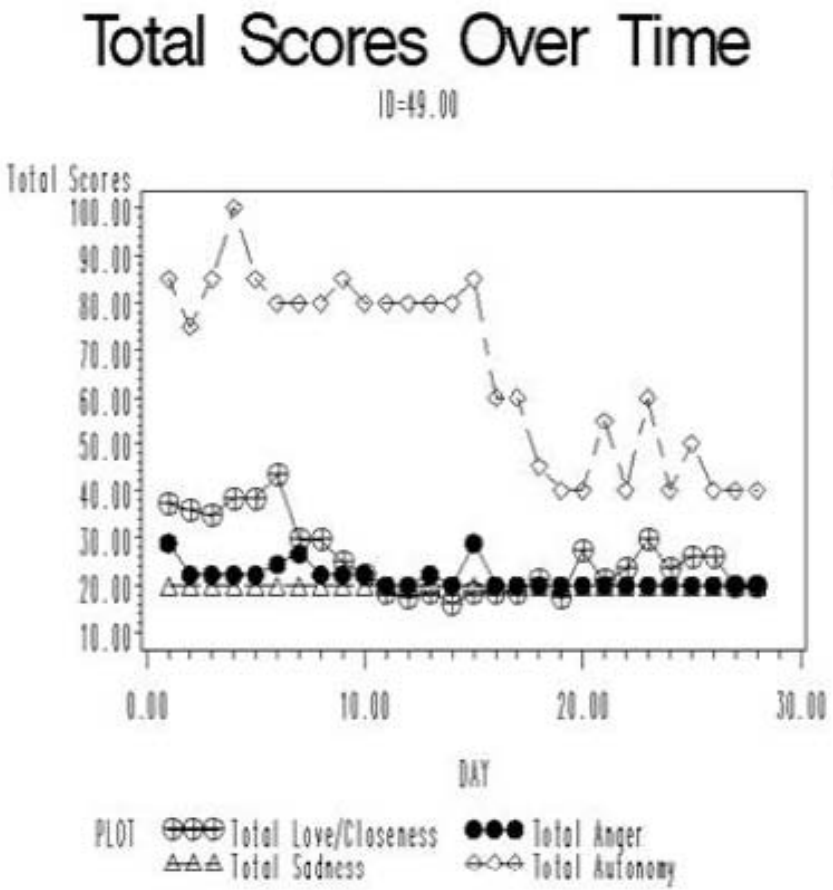
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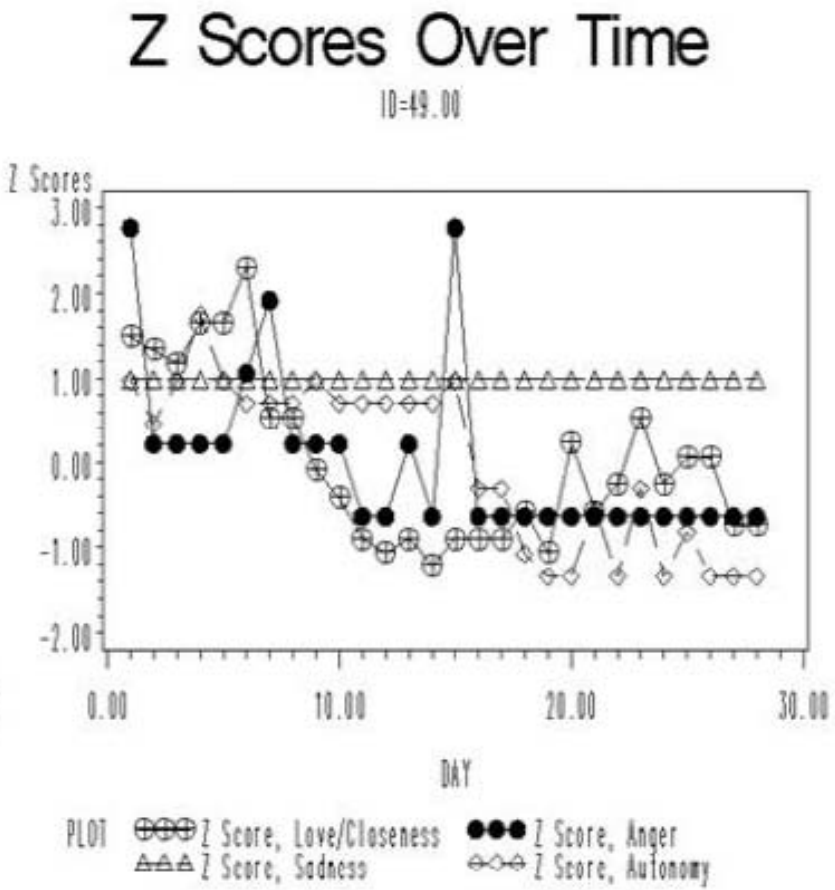
Total Sadness
Total Autonomy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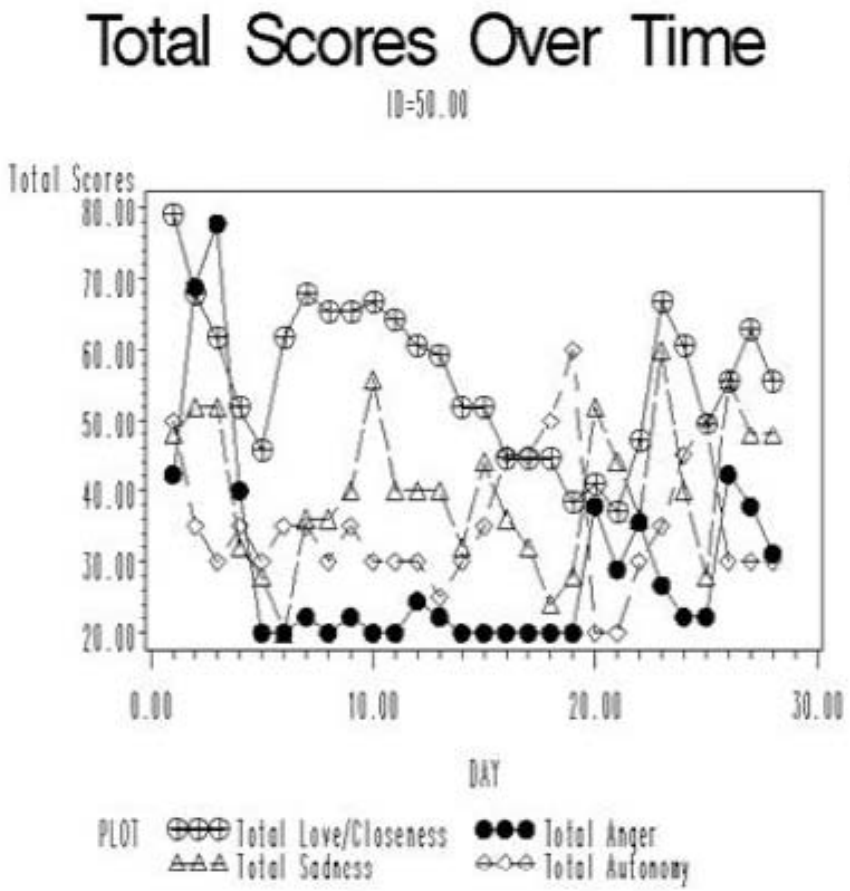
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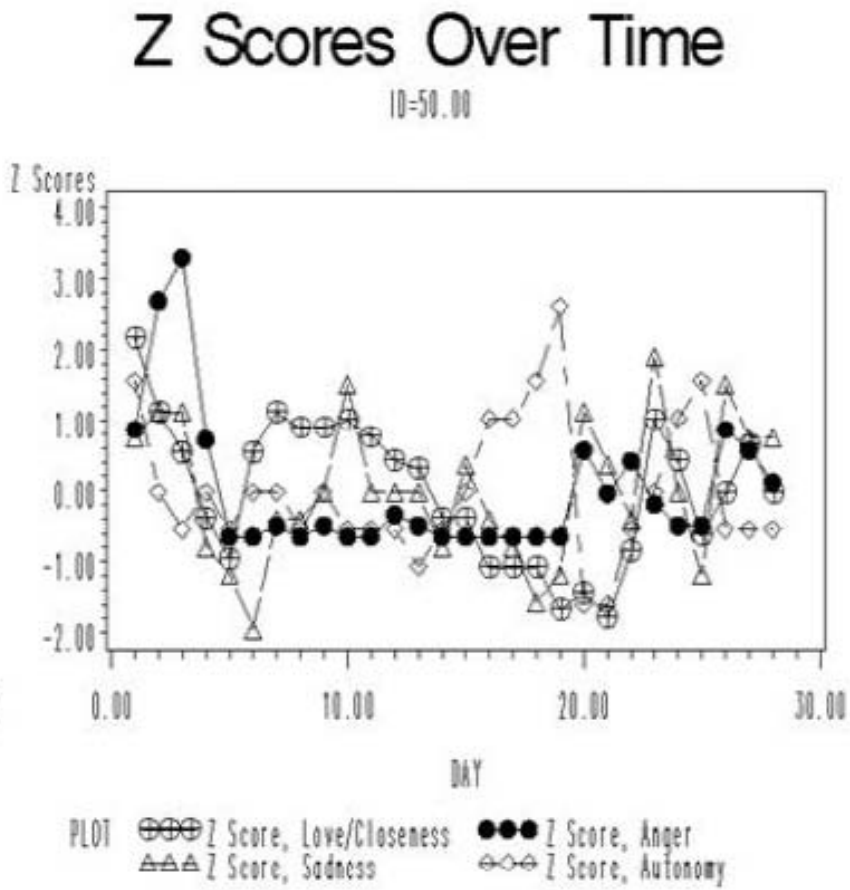
Total Love/Closeness
Total Anger
Total Sadness
Total Autonomy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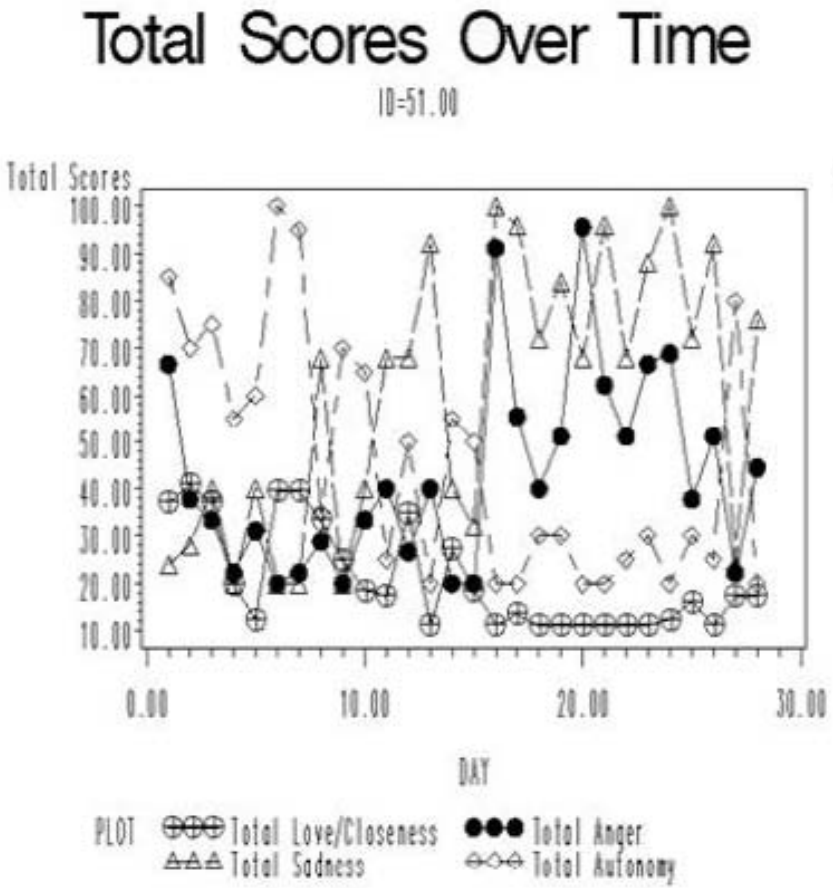
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Total Sadness
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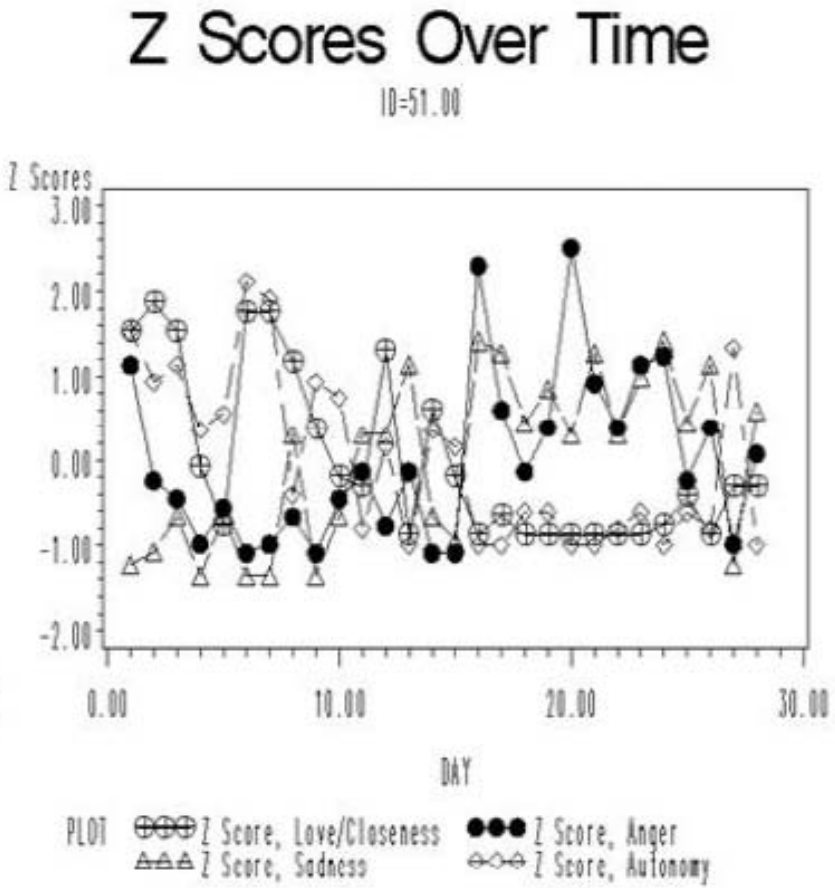
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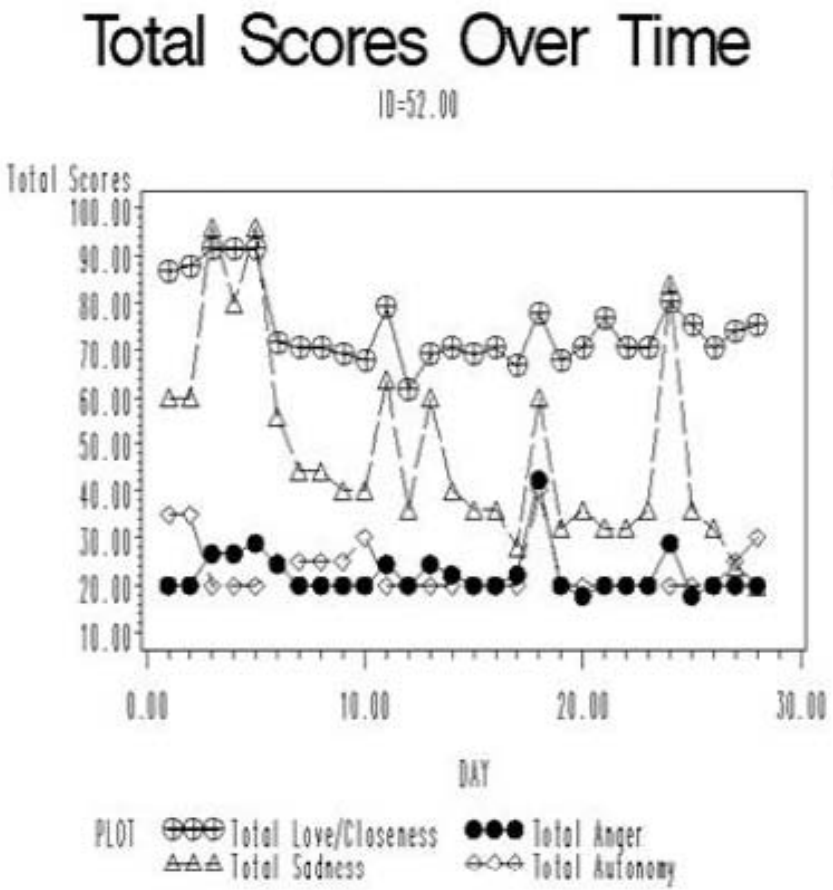
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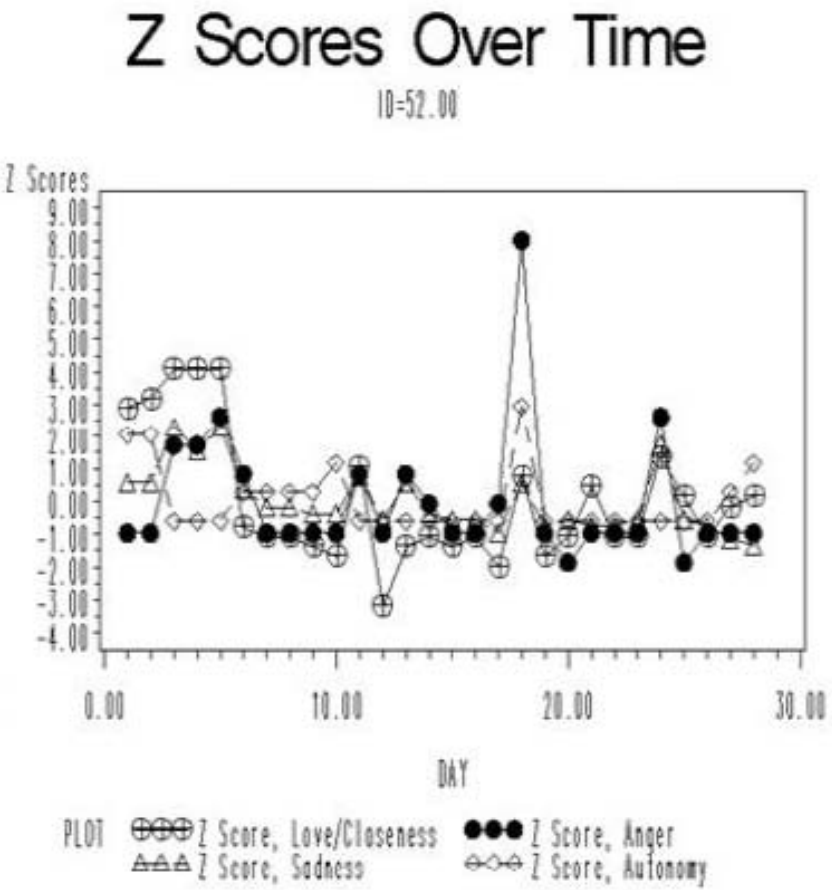
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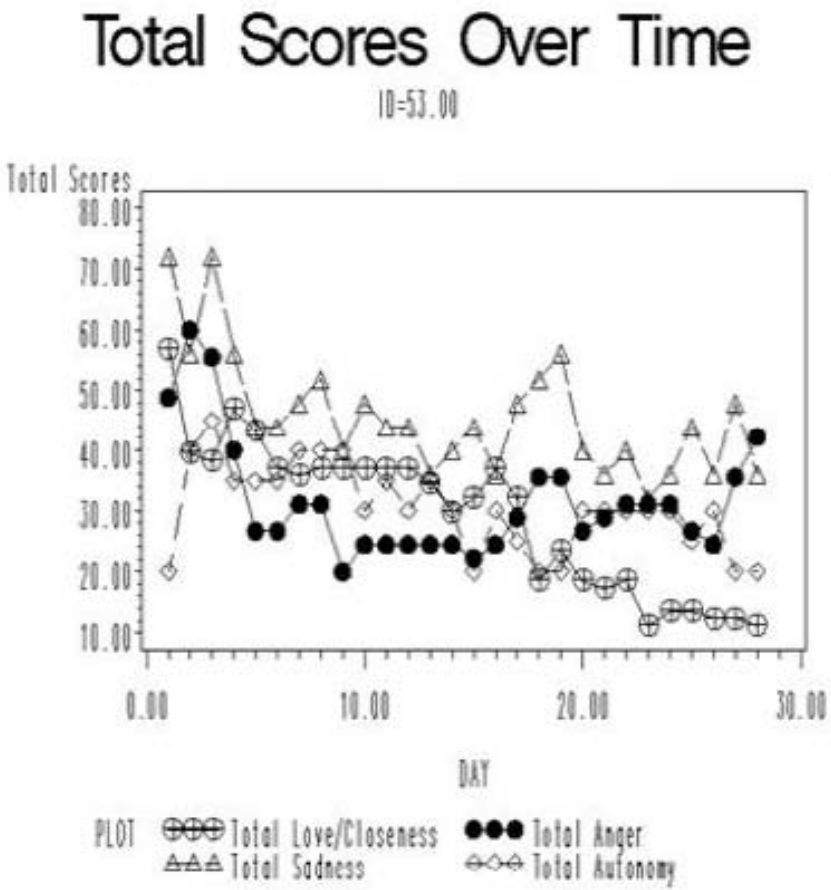
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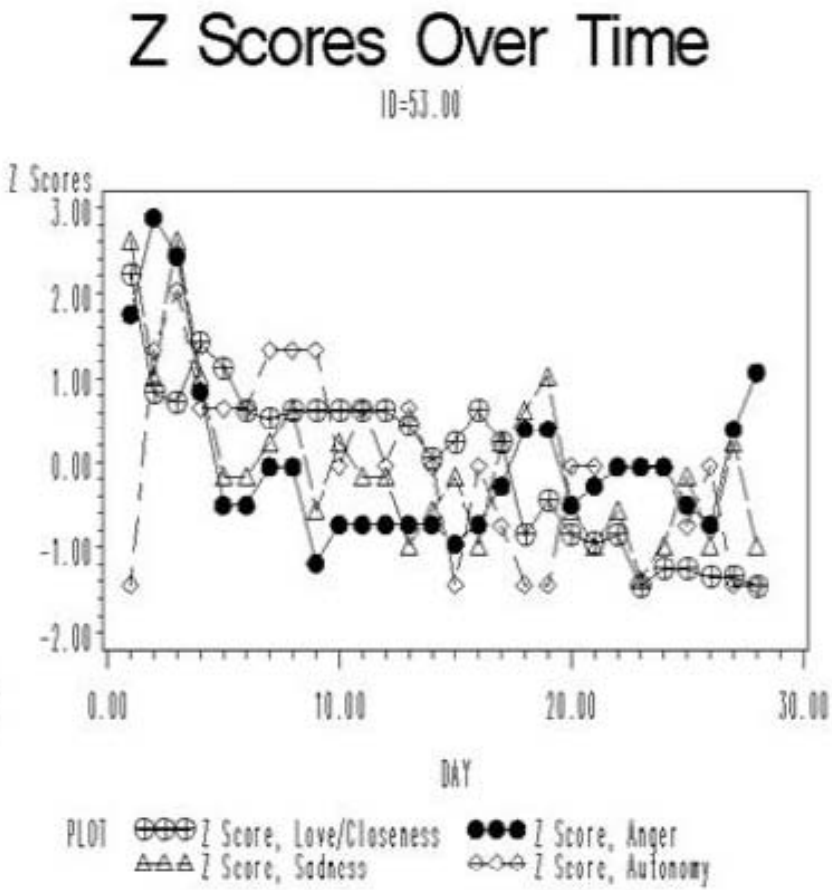
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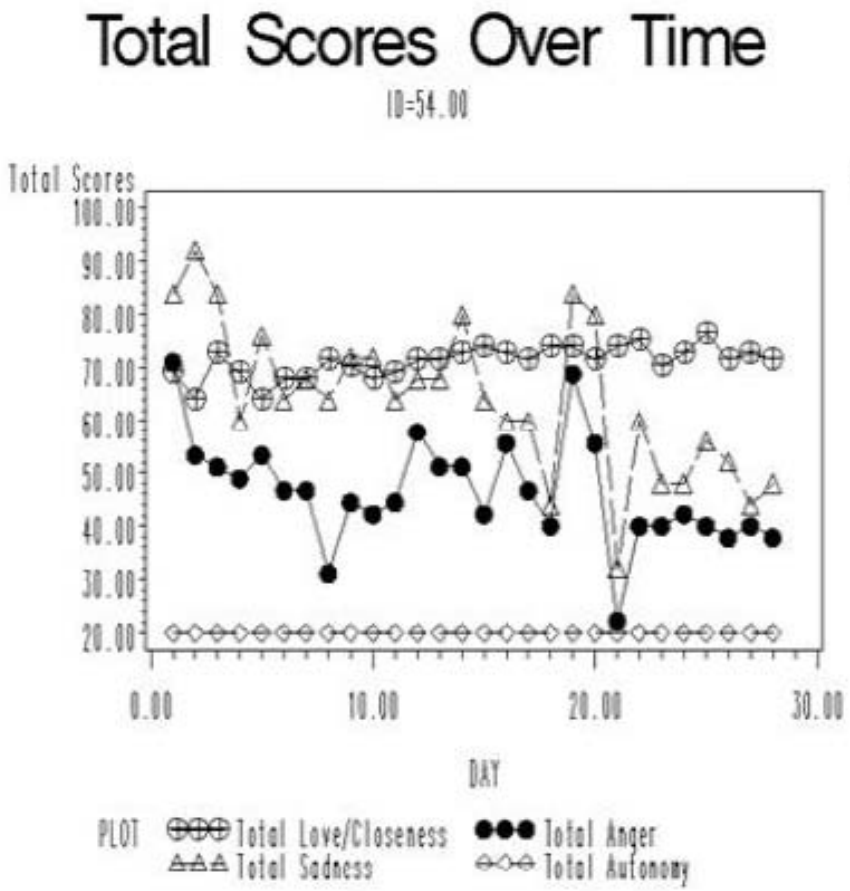
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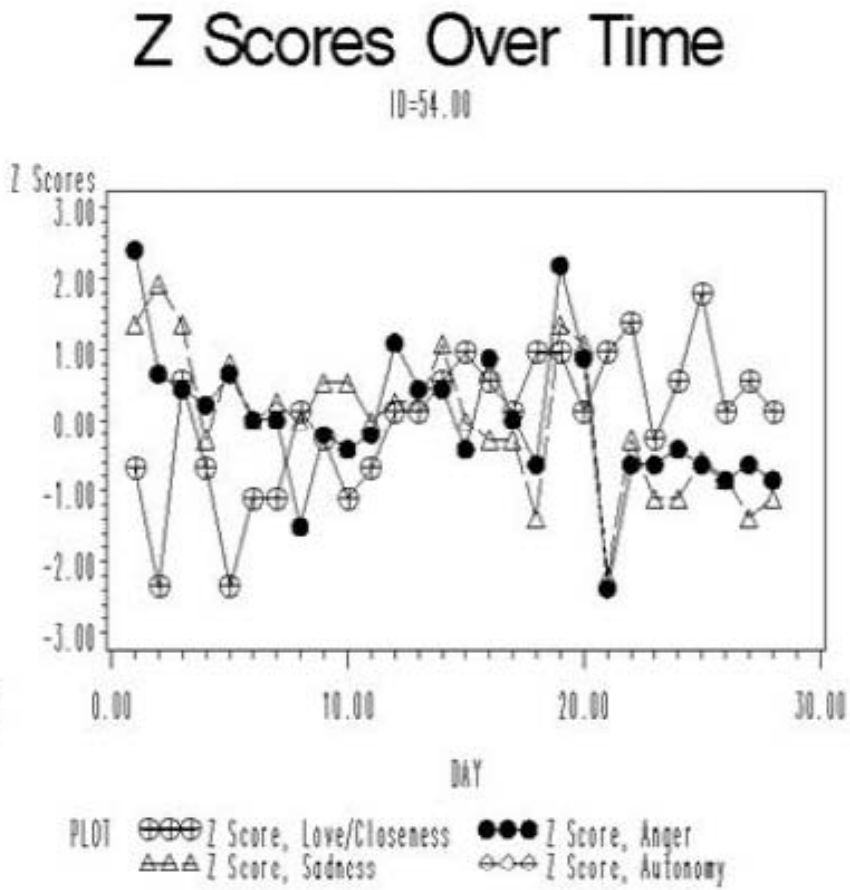
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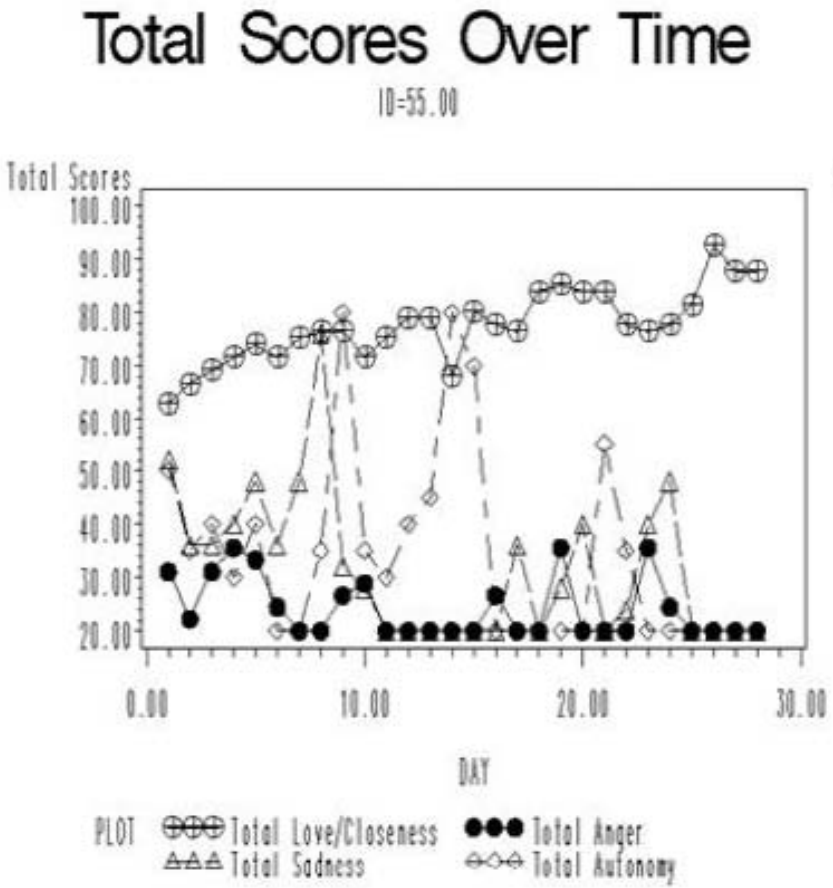
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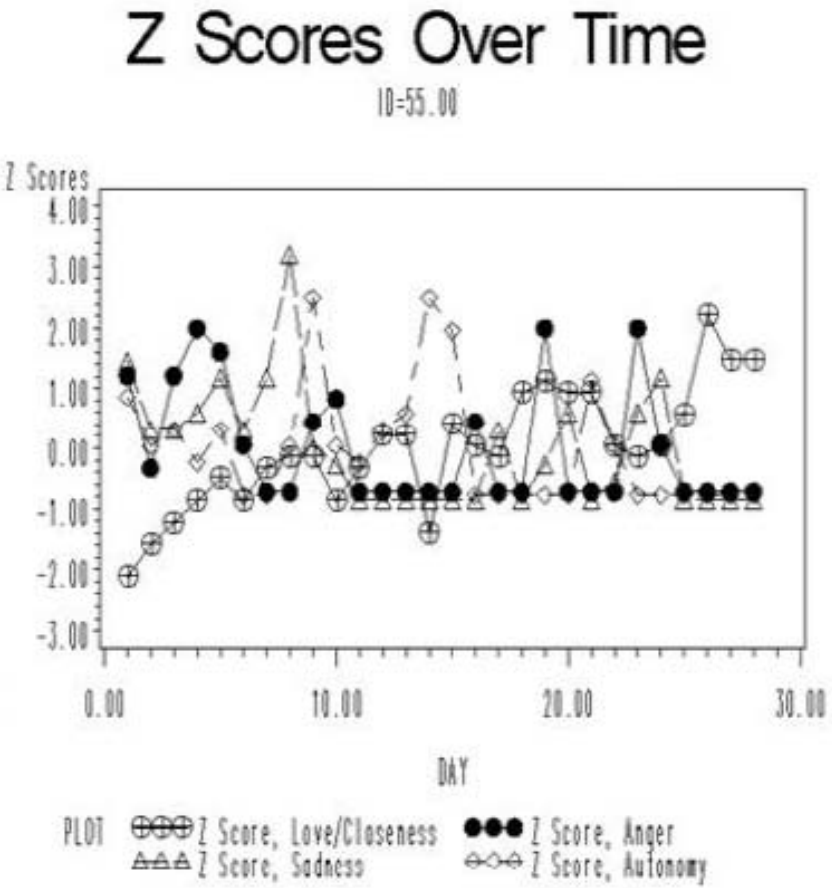
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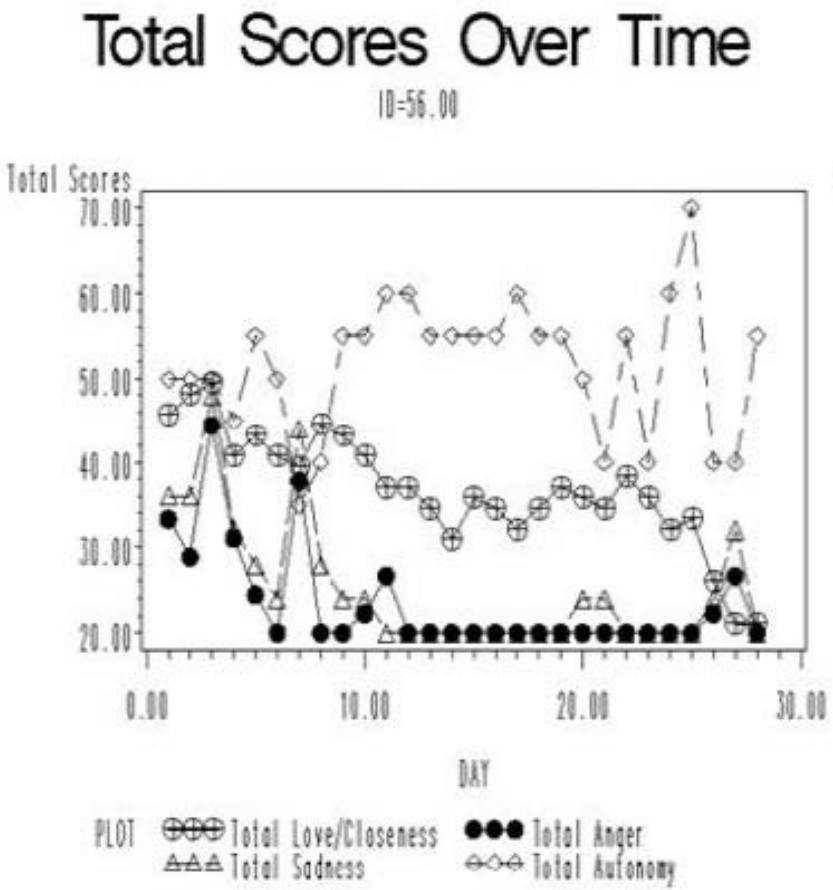
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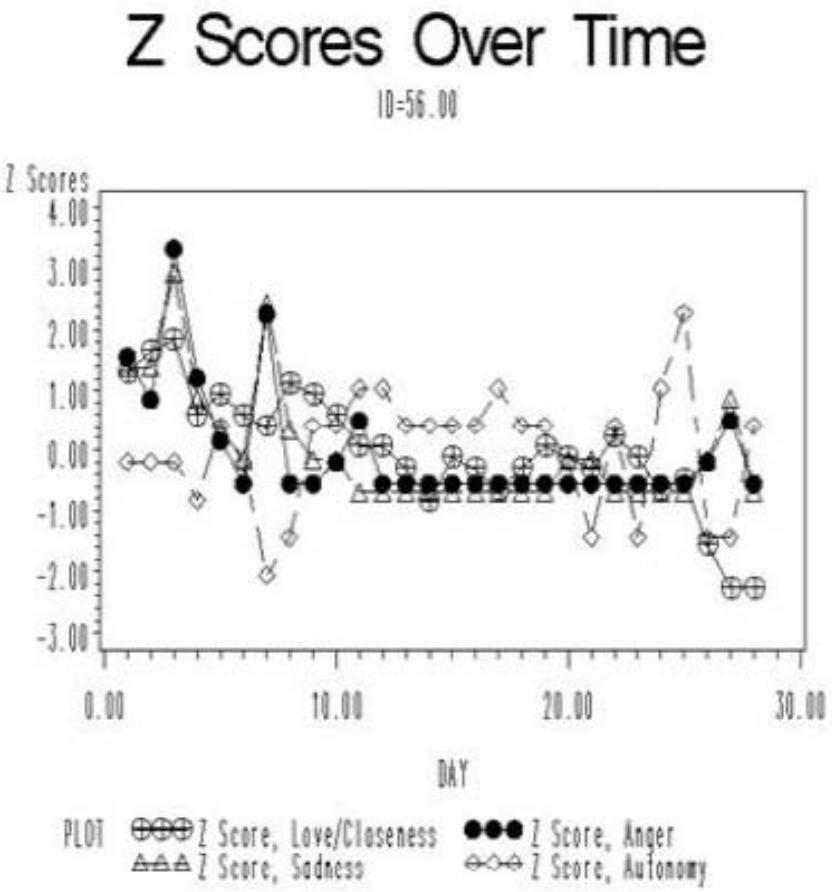
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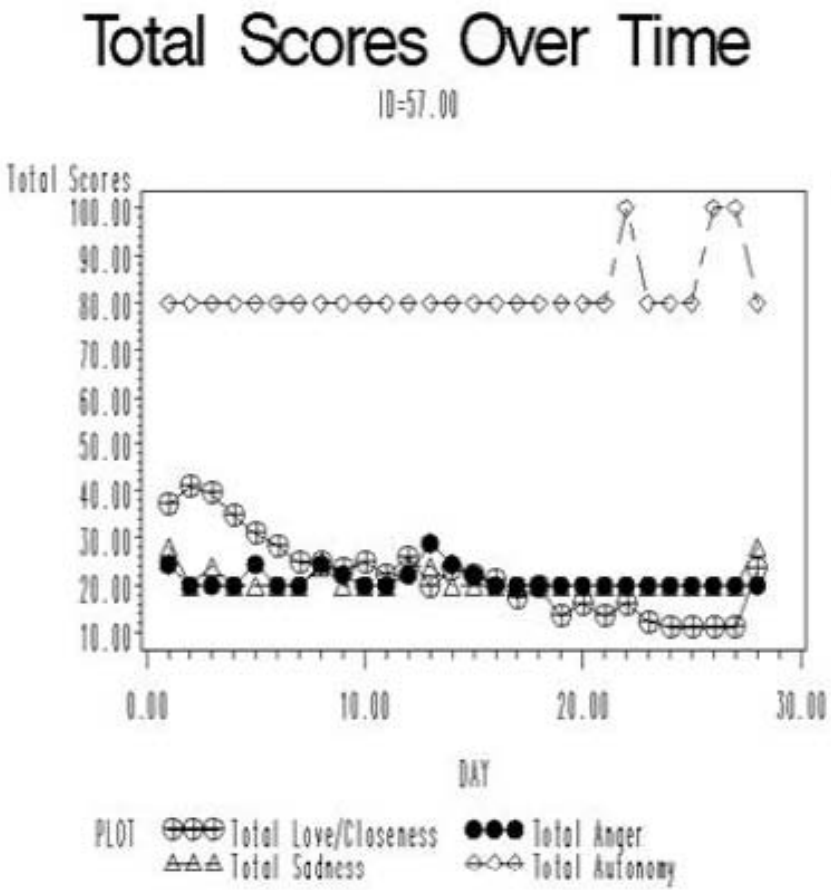
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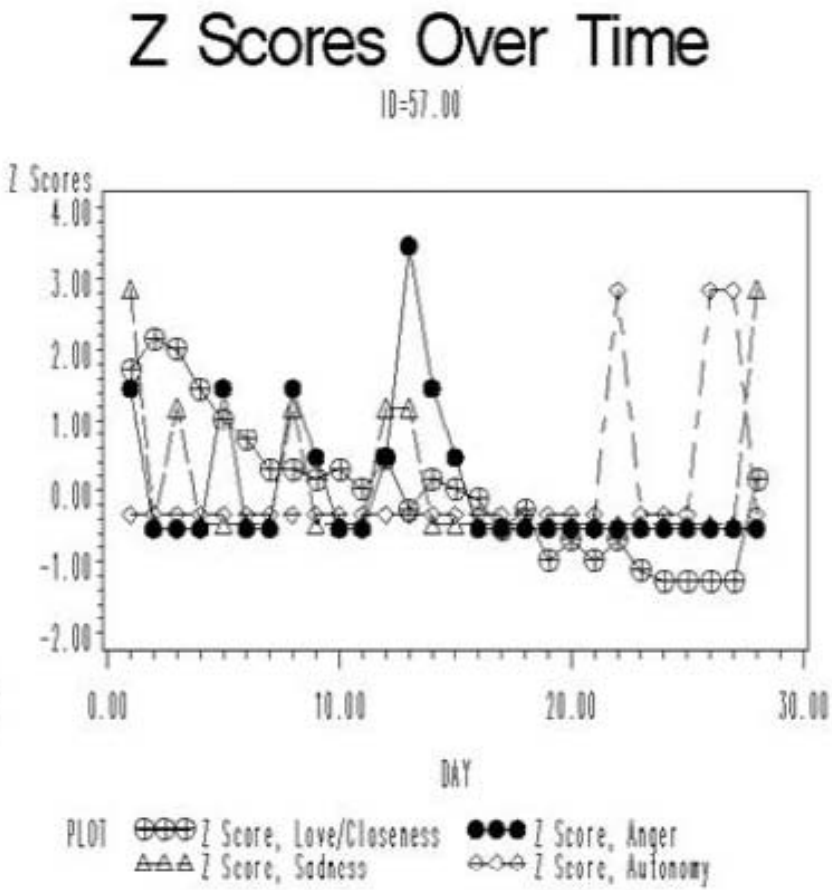
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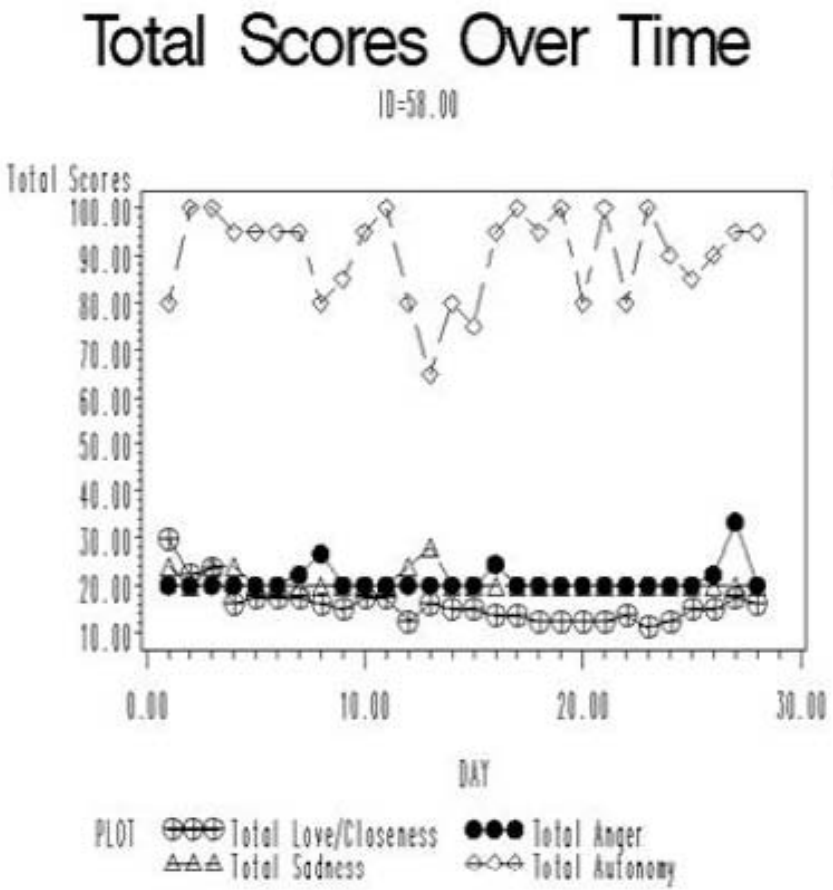
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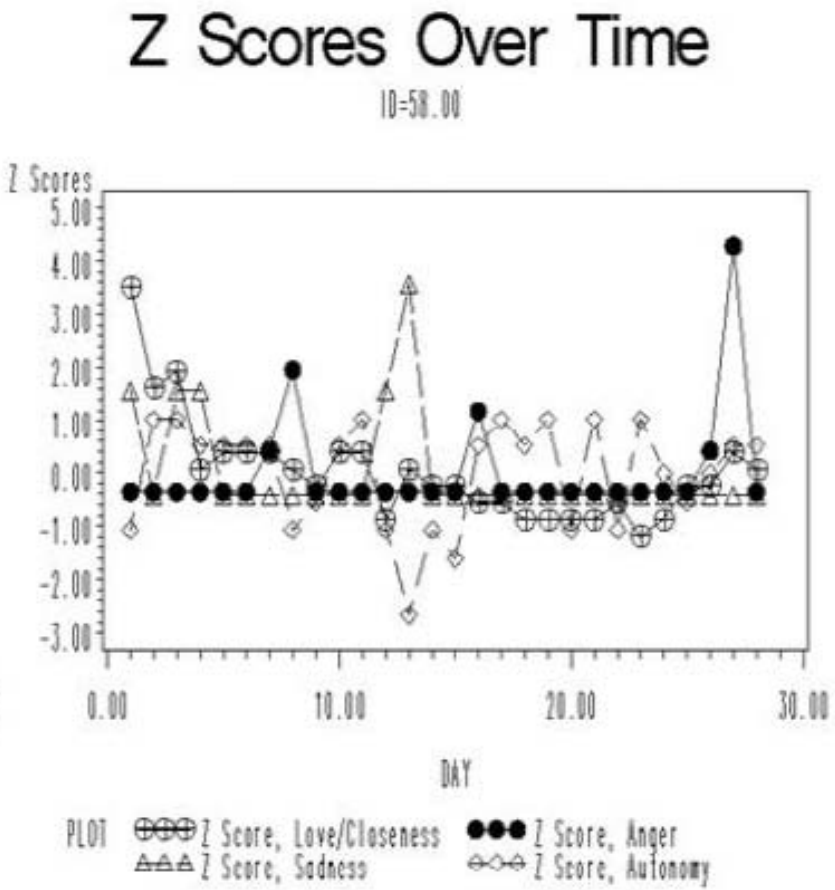
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