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Variability in Perceived Social Competence as a Predictor of

Emotional Reactivity in Early Adolescence

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A Thesis

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ABSTRACT

Variability in Perceived Social Competence as a Predictor of
Emotional Reactivity in Early Adolescence

M. Teresa Pizzamiglio, Ph.D.
Concordia University, 2002

The present research examines the long-hypothesized association between

variability of self-esteem and emotional reactivity within the context of peer interactions.

Self-esteem variability is defined as short-term fluctuations in self-esteem and

operationalized as the standard deviation of multiple assessments. Emotional reactivity is

defined as the association between the perception of an event and the emotional response

to it. 102 male adolescents (ages 13 to 15) participated in the research. Multiple data on

self-perceived social competence were collected using Time Sampling. These repeated

data were averaged into a measure of level of perceived social competence and the

standard deviation used as a measure of variability of perceived social competence.

Using the Experience Sampling Method, repeated data were collected in situ on the

perceptions of the quality of participants' peer interactions (1144 distinct peer events) and

on the emotional reactions following them as measured by scales of sadness, anxiety,

anger and positive affect. Individual difference data (e.g., popularity) were collected

during group testing. Hierarchical Linear Modeling was used for analyses. The

predictive power of (1) level and (2) variability of perceived social competence, (3)

emotional distress (measured with depression and anxiety scales), (4) popularity

(measured by peer rated friendship nominations and liking ratings), (5) scores on

Stability of Self scale and (6) the interaction between level and variability of perceived social competence were tested concurrently. Consistent with hypotheses, variability was associated with increased emotional reactivity to events, that is, it was a significant moderator of the association between perceptions of interaction quality and feelings of sadness, anxiety and positive affect. For example, participants with higher variability reported more sadness when interaction was perceived as negative than did their peers with less variable perceived social competence; no differences between participants were noted when the interaction was perceived as positive. Emotional distress was a significant predictor of the negative association between interaction quality and feelings of anger. Popularity acted as a 'buffer' to temper the association between interaction quality and sadness. Consistent with hypotheses, variability of perceived social competence was a significant predictor of higher levels of sadness, anxiety and anger. Unexpectedly, average level of perceived social competence was a significant predictor of higher levels of sadness, anxiety and anger. Results are discussed in terms of the nature and measurement of self-esteem variability, its role as a vulnerability factor for the experience of negative affect, and popularity's role as a protective factor.

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Introduction

Much theory and research has focused on the study of self-esteem and its

correlates, especially emotional distress (Baumeister, 1993; Bednar, Wells and Peterson,

1989; Harter, 1999). Most of the empirical research in the area has investigated level of

self-esteem and differences between people high and low in self-esteem (Baumeister,

1993). Only in the last few decades have researchers begun to examine other dimensions

and characteristics of self-esteem. In particular, researchers have looked at self-concept

stability, clarity and complexity (Campbell, 1990; Campbell, Trapnell, Heine, Katz,

Lavallee & Lehman, 1996; DuBois, Reach, Tevendale & Valentine, 2002; Kernis, 1993;

Linville, 1987; Rosenberg, 1986).

Although a portion of these studies have focused on younger age groups (DuBois

& Tevendale, 1999; Lipka, Hurford and Litten, 1992; Rosenberg, 1979; Savin-Williams &

Demo, 1983; Tevendale, DuBois, Lopez, & Prindiville, 1997), the majority of these

studies have been conducted with adults. The current investigation examines temporal

variability of self-esteem (or stability, the term used by some researchers) as an important

characteristic that has been largely neglected in the developmental area.

Self-esteem variability is defined as short-term (moment-to-moment) changes in

one's feelings about the self and one's competencies. Rosenberg (1979) was one of the

first researchers to study self-esteem variability as related to specific outcomes in children

and adolescents. Interest in variability as an individual difference characteristic, however,

preceded his research. For over a century, researchers have theorized on within-person

variability in emotions, behaviour and cognition. For instance, James (1890/1962) was

one of the first to refer to individual differences in the variability of self-feelings or self-esteem. He distinguished between level and stability of self-esteem and described level of self-esteem as "certain average tone of self-feeling which each of us carries about with him" (p. 195). He suggested the presence of variability in self-esteem as "the barometer of our self-esteem and confidence rises and falls from one day to another through causes that seem to be visceral and organic rather than rational" (p. 196). James clearly outlines the conceptual difference between the level and variability and first used the word "barometric" self-esteem, later borrowed by Rosenberg (1986), to label fluctuations or variability around an average level of self-esteem that seems fairly stable and enduring. Other psychologists have endorsed the notion of individual differences in the variations of traits that are attributable to "characteristic range of variability, itself an attribute of personality" (p. 110, Murray, 1938/1981; see also Cattell, 1973; Fiske, 1961; Fiske & Rice, 1955). Recently, advances in methodological and statistical techniques have aided researchers to design studies and analyse data in more sophisticated ways (see Collins & Sayer, 2001; Larsen, 1987; Nesselroade, 1990, 1991). There has also been renewed interest in the investigation of variability and change as important foci for research in adolescence.

Adolescence and Identity Development

Many researchers, including Rosenberg (1986), have discussed the importance of the development of a sense of self and identity during adolescence (Baumeister, 1986; Erikson, 1968; Harter, 1999). Identity development becomes particularly meaningful because of physical, cognitive and social changes experienced by adolescents.

Adolescents' increasingly developed cognitive abilities allow them to think in more complex ways about themselves and to reflect and introspect about their own thinking processes and choices (Erikson, 1968; Rosenberg, 1986). Adolescents think of themselves differently, contemplate alternative values, images and characteristics and experiment with them in search of an identity. As Erikson (1968) suggested, during the normal developmental process many adolescents (although not all) begin to question the values transmitted by their parents and this questioning and 'trying on' of different personas can engender what has been labelled "identity crisis". The successful resolution of the identity crisis is crucial to the adolescents' ability to make coherent choices, to commit to them and to achieve appropriate emotional development (see Baumeister, 1986; Erikson, 1968, Marcia, 1966, 1967).

The number of choices available makes it difficult for an adolescent to commit to certain values while discarding others (Baumeister, 1986). The identity crisis is often characterized by much confusion and emotional turmoil, a period in which adolescents' self-concepts undergo important changes, both in terms of the complexity of one's self-views and the content and definition of one's self. Investigators have documented increased instability and variability in self-esteem and sense of self during this period (Demo & Savin-Williams, 1992; Rosenberg, 1979). As well, temporary decreases in level of self-esteem have been observed (Harter, 1998, 1999; Rosenberg, 1986; Savin-Williams & Demo, 1984).

Peer relationships play a very important role in helping adolescents not only question their own values and identity but also to try on new values and identities and to

evaluate them (Savin-Williams & Berndt, 1990; Sullivan, 1953). The opinion of peers becomes increasingly important as the adolescent experiments with new values and behaviours, and seeks out others' approval and acceptance in his or her new roles. Adolescents start to experience more egalitarian relationships in comparison to the more hierarchically organized parent-child relationships (Youniss & Smollar, 1985). Adolescents spend increasing amounts of time (up to a third of time for high school students) with peers (Csikszentmihalyi & Larson, 1984) and the peer group's influence becomes increasingly important. However, it is possible that excessive reliance on peers' social approval may put adolescents at risk for increasing, or at least maintaining, their unstable sense of self (Harter, 1999; Rosenberg, 1986).

Although the current study does not directly address issues of identity formation or the content of the self-concept, its goal is to examine changes in the self-esteem and their association with emotional reactivity within the context of peer relationships, an important domain for adolescents. Investigating more in depth the fluctuations in adolescents' self-views can help further the understanding of the emotional turmoil experienced by adolescents.

Rosenberg's Theory

Rosenberg (1986) made the distinction between "barometric" self-esteem, defined as the individual's experience of moment-to-moment changes in self-attitudes (self-esteem) and "baseline" self-esteem, defined as changes in self-esteem taking place gradually over time, months or years through life experiences, for example, successful work experiences generating increased level of self-esteem. Rosenberg proposed that

during adolescence, individuals were likely to experience a volatile and changeable self-esteem because of the physical, cognitive and social factors operating at this developmental stage (Baumeister & Tice, 1986; Rosenberg, 1986). Frequent and large fluctuations in self-feelings (unstable self-esteem) would be particularly distressing because when self-feelings fluctuate often, the individual was likely to be uncertain, anxious and experience psychological distress. Most importantly, he proposed that adolescents whose self-feelings showed a lot of fluctuations would be more concerned and sensitive about what others, especially peers, would think of them. Thus, they would be more likely to attribute greater importance to the opinions of others, or to their perceptions of what others think of them. In other words, Rosenberg suggested that individuals with fluctuating self-feelings would show greater emotional sensitivity and reactivity to others' perceived opinions and reactions.

Although Rosenberg (1986) did not give a specific definition of reactivity, the Oxford dictionary (Sykes, 1982) defines reactivity as responsiveness (emotional or behavioural) to a stimulus. Increased responsiveness can imply two related phenomena: first, an increased response to the same stimulus; that is, if an event would normally elicit an emotional response of sadness, such as a disagreement with a friend, increased reactivity could imply that some individuals (with variable self-esteem) will experience more sadness after a disagreement than another adolescent with stable self-esteem having a similar disagreement with his friend. Reactivity can also imply a greater positive reaction following a positive event. This definition of a greater degree of response is the interpretation most commonly used for emotional reactivity and/or response. A second,

closely related, aspect of reactivity implies a closer match between a stimulus and the response to it. In other words, there is a stronger association between the perception of an event and one's emotional response. In the example above, the emotional reactions of individuals with variable self-feelings would closely match their perception, so that as they perceive the event more negatively, they would experience more negative affect. Although individuals with less variable self-feelings would also experience the event as negative, their emotional reactions may not be as closely matched, that is, they may experience little if any negative affect.

Rosenberg implied a model of reciprocal causality in describing the association between reactivity and fluctuating self-views: the more the adolescent's self-feelings fluctuated, the higher his or her emotional reactivity to other's opinions. Similarly, as adolescents were more sensitive and reactive to others' opinions, they would be more likely to incorporate contradictory and changing views on the self (as reflecting opinions and appraisals of many others) and thus develop more fluctuating self-feelings. This investigation examines one aspect of this reciprocal model: the effect of fluctuating self-feelings on emotional reactivity. However, this stance does not negate the impact of emotional reactivity on self-esteem and the reciprocal influences likely operating.

Although researchers have investigated this area and shed light on different aspects of self-esteem variability and its correlates, some crucial questions about emotional reactivity remain unanswered. Most importantly, the question of reactivity to events, defined as the association between one's perception of an event and one's emotional reaction, has not been directly examined within the context of naturally occurring events.

Investigating these issues can help in understanding how individual differences in self-characteristics can influence emotional reactions. These emotional experiences are likely significant for emotional health and regulation. Understanding better these mechanisms can in turn help us understand how some individuals may be more vulnerable to emotional and psychological distress. The main focus of the current investigation is the prediction of emotional reactivity to everyday events as a function of individual differences in the variability of self-esteem of early adolescents. Secondarily, other individual difference variables, such as emotional distress, will be concurrently examined in the prediction of emotional reactivity.

It should be noted that in the thesis, the words 'fluctuation' and 'change' will be used as synonyms for the word 'variability'. Rosenberg (1986) preferred the word 'instability' to define frequent fluctuations in self-esteem and some authors use 'instability' and 'variability' interchangeably.

Self-esteem Variability and Emotional Distress

The term 'emotional distress', as used in the current project, refers generally to negative and unpleasant emotional states, such as subjective feelings of dysphoria, depression, tension, anxiety, irritability, etc. Elevated levels of these feelings tend to generally cause discomfort and distress in children and adults. Early investigations support the notion that self-esteem variability is accompanied by emotional distress in children and adolescents. Rosenberg (1979) found that scores on the Stability of Self Scale, a reliable self-report measure of adolescents' perception of the temporal fluctuations of their self-view, was related to measures of distress. Adolescents with

fluctuating self-esteem had higher scores on self-report measures of depression, irritability, hostility, overt aggression, anxiety, and anxiety-related somatic symptoms (Bachman, Kahn, Mednick, Davidson & Johnston, 1967; Rosenberg, 1979, 1985; Rosenberg & Simmons, 1972). These associations remained significant after taking into account level of self-esteem and suggested that variability was independently associated with indices of emotional distress.

These findings were replicated on samples of late adolescents and young adults. Studies with college students show that self-esteem variability, as measured by the Stability of Self Scale, was significantly related to self-report measures of social anxiety, public self-consciousness, over-generalization following failure, social desirability, self-handicapping and fear of negative evaluation (Kernis, Grannemann & Barclay, 1992). These results support the notion that self-esteem variability is related to negative affect and emotional distress generally. Some studies have more specifically examined the association between variability and dysphoric or depressive feelings.

Self-esteem Variability and Feelings of Depression

Cross-sectional and short-term prospective studies provide empirical evidence that self-esteem variability may be a diathesis or vulnerability factor in the development of depressive feelings in non-clinical populations. Although the term 'depression' is used in these studies, it is important to keep in mind that these are not clinical samples and that high scores on depression scales are not equivalent to a diagnosis of depression. Tevendale and colleagues found that in a sample of young adolescents, greater degree of instability of self-perceived competence in the peer domain (measured by the standard

deviation of repeated assessments) was associated with higher feelings of depression and dysphoria, independent of trait level of social competence or of daily hassles in the peer domain (Tevendale et al., 1997). Instability in perceived social competence also significantly interacted with level of perceived social competence: Instability was more strongly associated with dysphoric feelings when participants showed low to average levels of perceived social competence.

Focusing on late adolescents, Kernis and his colleagues assessed level and variability of self-esteem (the latter indexed by the standard deviation of repeated assessments of current self-esteem), overgeneralization of failure, attribution style and feelings of depression at time 1, followed one month later by assessments of daily hassles and depression at time 2 (Kernis, Whisenhunt, Waschull, Greenier, Berry, Herlocker & Anderson, 1998). Depressive feelings were higher for individuals with high self-esteem variability who experienced many hassles compared to individuals with low self-esteem variability. These effects remained significant after controlling for participants' feelings of depression at time 1, level of self-esteem, tendency to overgeneralize failure, and stable and global attribution style. In addition, level and variability of self-esteem also interacted so that variability predicted more dysphoric feelings for participants high in self-esteem and fewer dysphoric feelings for participants with low self-esteem (Kernis et al., 1998). As argued by Kernis, self-esteem variability thus seemed to be a diathesis for the development of depressive feelings in the presence of stressful events, and predicted such feelings in participants with high level of self-esteem.

In another study, variability of repeated measures of self-esteem in both male and

female college students predicted depressive feelings following a naturally occurring academic stress (receiving an exam grade below expectation) after controlling for initial levels of depression (Roberts & Monroe, 1992). In a similar study, Roberts and Gotlib (1997) found that college women with greater variability in daily self-esteem (measured as the standard deviation of repeated measures) showed more depressive feelings following stressful life events than did women with less variable self-esteem. The effects remained after controlling for level of neuroticism and feelings of accuracy in their self-ratings. Interestingly, temporal variability in affect measures (i.e., "moodiness") did not predict depressive feelings (Roberts & Gotlib, 1997). In summary, there is consistent empirical support for the role of self-esteem variability as a vulnerability factor in the development of feelings of depression, and in some investigations, this association was found to be stronger when variability was combined with stressful events. However, there seems to be contradictory evidence about whether the influence of variability is greater when participants are low or high in self-esteem.

Perceptions of Importance

Apart from considering self-esteem variability as a source of distress, Rosenberg (1979) also suggested that individuals with high self-esteem variability would be more influenced by others' opinions and would attribute more importance to them than would individuals with more stable self-esteem. Kernis and Waschull (1995) extended the argument to propose that fluctuating self-esteem would be related to excessive reliance on, and sensitivity to any source of evaluation, whether external or internal. Individuals with unstable self-esteem would be more likely to perceive that their self-esteem is "on the

line" and view everyday events as more important and relevant to the self (Baumeister, 1982; Kernis & Waschull, 1995).

College students with variable self-esteem perceived daily negative events as more important than did students with stable self-esteem. This pattern was not replicated for positive daily events (Kernis, Greenier, Whisenhunt, Waschull & Berry, 1993; cited in Kernis & Waschull, 1995). The perceived valence and importance of the daily event were partial moderators of the association between self-esteem variability and participants' subjective perception of the event's impact on their self-esteem. It is important to note that the events rated were different for each participant. Therefore, individual differences in the perception of events and the characteristics of the events rated were completely confounded with each other.

Another study of children provides additional evidence that events are perceived as more relevant and important for the self (Waschull & Kernis, 1996). Investigators presented fifth grade children with hypothetical scenarios of aversive same-sex peer interactions intended to provoke anger. Participants were presented with two reasons for becoming angry: one reason reflected self-esteem threat, the other, instrumental thwarting. Self-esteem variability was measured as the standard deviation of repeated assessments of self-esteem during class times. Children with variable self-esteem were more likely to cite self-esteem threats as a reason for becoming angry than were children with more stable self-esteem. The findings suggested that children with variable self-esteem felt more personally threatened and were more ego involved than did children with less variable self-esteem.

These studies provide support for the notion that self-esteem variability is linked to ego-involvement, defined as considering events as important to the self, in the perception of everyday activities and also, as measured indirectly by the degree of perceived threat in experimentally manipulated situations. However, findings were based on retrospective data and reactions were indirectly assessed by implicit measures of ego-threat. Most of the studies have found significant results for negative events and not for positive ones. This pattern is consistent with empirical research that indicates negative events and negative information about the self are considered to be more salient and have a greater impact on emotional responses than positive events do (Schwartz, 1986). However, no study to date has examined these phenomena directly as they unfold and few studies have included emotional responses to positive events or situations.

Specific Emotional Reactions

Empirical evidence also appears to demonstrate a link between variable self-esteem and specific types of emotional reactions, such as pride or anger (Kernis & Waschull, 1995). After collecting measures of self-esteem level and of variability of repeated measures of self-esteem, Kernis and his colleagues presented college students with hypothetical positive events and assessed their reactions with the Test Of Self-Conscious Affect (TOSCA), a scale measuring pride in oneself and in one's behaviour. Self-esteem variability was related to feelings of pride, at least amongst individuals with high self-esteem, who showed the most pride and reacted in the most self-enhancing way by endorsing positive self-attributes. However, pride was not directly related to level of self-esteem nor was an association found between pride and variability in low self-esteem

individuals (Kernis & Waschull, 1995). These findings are consistent with Kernis'

hypotheses that individuals with high but unstable self-esteem would be vulnerable to

attacks as they could lose important yet fragile positive self-feelings. These individuals are

thus more likely to 'embellish' their positive experiences (i.e., show the most pride) to

bolster their positive feelings (Kernis & Waschull, 1995).

With respect to feelings of anger, the results followed a similar pattern: self-

esteem variability was related to greater self-report ratings of anger and hostility

proneness, especially in high self-esteem individuals (Kernis, Grannemann & Barclay,

1989). However, the self-reports were not elicited following an event, but rather, were

'typical' self-ratings of anger. Following a variant of the Experience Sampling Method

(Larson & Csikszentmihalyi, 1983), Kernis and his colleagues measured self-esteem

variability and self-report measures of anger and hostility. Self-esteem variability was

related to higher levels of anger and hostility. Individuals with high, unstable self-esteem

experienced the highest levels of anger and hostility. Individuals with stable high self-

esteem had the lowest levels. For individuals with low self-esteem, variability was not

related to anger and hostility levels, which were at moderate levels and between the levels

of high unstable and high stable self-esteem individuals (Kernis, Grannemann & Barclay,

1989).

Anger is an emotion that is often experienced after self-esteem threats of an

interpersonal nature (Averill, 1982). These results are consistent with Kernis' hypotheses

about the interaction between level and variability of self-esteem. Similarly to the

experience of feelings of pride, he proposed that individuals with high but unstable self-

esteem are very vulnerable to attacks (and thus prone to anger) as they can lose important but fragile self-feeling. In another study examining defensiveness and excuse making following experimentally manipulated feedback, no significant differences were found relating to variability in overall positive or negative affect measures (Kernis, Cornell, Sun, Berry & Harlow, 1993). However, analyses were not conducted on specific emotional states such as anger, anxiety and sadness.

Other evidence for the greater reactivity of unstable (high) self-esteem individuals is provided by studies focusing on individuals' reaction to evaluation as a function of various cognitive and affective measures such as degree of defensiveness, excuse making and acceptance of feedback (Kernis et al., 1993; Kernis, Granneman & Barclay, 1992). In a study investigating reactions to interpersonal (manipulated) positive or negative feedback, individuals with unstable high self-esteem, as compared with individuals with stable high self-esteem, reacted more favourably to positive evaluation as measured by aggregate ratings of positive affect, judgements of accuracy of feedback and attraction to evaluator. In response to negative evaluations, unstable high self-esteem individuals had less favourable reactions than did stable high self-esteem individuals, as measured by greater derogation of the evaluator and evaluation technique (Kernis et al., 1993, Study I).

In another investigation examining reactions to hypothetical poor or good performances following either a positive or negative mood induction, results indicated that unstable high self-esteem participants were more likely to endorse defensive reactions than high stable self-esteem individuals in the negative mood induction. Unstable high self-esteem individuals were also more likely to doubt their ability and to feel stupid following

a poor performance than were stable high self-esteem individuals, indicating increased

fragility of their self-esteem. Following a hypothetical good performance, there was also a

general tendency for unstable self-esteem individuals, regardless of their level, to endorse

more self-aggrandizing responses than individuals with stable self-esteem (Kernis,

Greenier, Herlocker, Whisenhunt, & Abend, 1997).

The pattern of results for instability in low self-esteem individuals does not appear

as clear and consistent as that for high unstable self-esteem individuals. For individuals

who were low in self-esteem in the Kernis et al. study (1993, study I), variability was not

associated with increased positive affect in responses to positive feedback. For negative

feedback, individuals with unstable low self-esteem tended to be less defensive (more

accepting) than people with stable low self-esteem, as measured by higher ratings of

accuracy and of perceptions of diagnostic value of the negative feedback (Kernis et al.,

1993, Study I). In another study, unstable low self-esteem participants were somewhat

more likely to report blaming responses for a hypothetical poor performance (Kernis et al.,

1997). Other studies conducted by Kernis and his colleagues seem to indicate that

unstable low self-esteem individuals tend to use less self-serving and self-protective

attribution styles than do individuals with stable low self-esteem (Greenier, Kernis &

Waschull, 1995). The results of these studies are inconsistent and only partially support

Kernis' hypotheses about individuals with low unstable self-esteem. These individuals

have been hypothesized to be more resilient than individuals with stable low self-esteem

and to attempt to avoid negative self-feeling by using more defensive strategies when

faced with negative events. Individuals with stable low self-esteem are hypothesized to be

less sensitive to events and make fewer attempts to either counter the impact of negative events or embellish the impact of positive ones (Kernis, 1993).

In summary, the consistent significant associations found suggest that level and variability of self-esteem interact to predict levels of emotional reactions. Individuals with high, unstable self-esteem appear to be engaging in protective and enhancing strategies to defend a positive but fragile self-esteem. Compared to individuals with stable high self-esteem, they tend to engage in more defensive strategies (and experience more anger) when faced with negative feedback or events and tend to experience pride and use self-enhancing strategies (and experience more positive affect) when faced with positive feedback or events. For individuals with low self-esteem, the evidence for the link between self-esteem variability and emotional reactions is inconsistent. Although feelings of pride and anger, or defensive patterns of responses, are not associated with variability in low self-esteem individuals, it is possible that other emotional states, such as fear and sadness might be. The emotions of sadness and fear are linked to measures of emotional distress such as depression and anxiety scales and their investigation may shed light on the link between self-esteem variability and reports of depressive feelings. The current study will examine the association between self-esteem variability and level and various emotional states such as anxiety, sadness, anger, and positive affect in response to interpersonal events.

The focus of the current study is on variability of self-feelings; however, a rigorous test of the hypotheses that self-esteem variability is a predictor of emotional responses should include other factors that have been found to relate to emotional reactivity. This

inclusion would allow us to examine the question of whether self-esteem variability uniquely affects emotional responsiveness or whether its association with emotional reactivity overlaps with other predictors. The empirical research on two potential predictors of emotional responsiveness, emotional distress and popularity, will be briefly reviewed in the next two sections.

Emotional Distress and Emotional Reactivity

Theoretical approaches that emphasize the importance of genetic and temperamental influences in the experience of emotions (e.g., Gray, 1982, 1999) have postulated that there are individual differences in the extent to which individuals experience certain types of affect and in the extent of their reaction to environmental stimuli. There is ample empirical evidence that personality traits like neuroticism or negative affectivity (NA) exaggerate the experience of negative emotions and/or affect overall (Costa & McCrae, 1980; Watson & Clark, 1984). Experiencing clinically significant levels of anxiety and depression is related, by definition, to increased levels of negative emotions such as sadness, irritability and fear, and most importantly, to an increased sensitivity and reactivity to emotional-eliciting situations (Barnett & Gotlib, 1988; Beck, Rush, Shaw, & Emery, 1979). Measures of the dispositional construct of negative affectivity have often included measures of anxiety and depression. Pertinent to this investigation is the empirical finding that negative affectivity and emotional distress are correlated with lower ratings of self-esteem (Watson & Clark, 1984) and that measures of emotional distress are correlated with measures of self-esteem variability (Rosenberg, 1979).

To summarize, it appears from empirical research that the construct of emotional distress is related to (1) experience of increased negative emotions and decreased positive emotions in general, (2) to increased reactivity to emotion-eliciting events or stimuli, and (3) to self-esteem and self-esteem variability. To put the basic hypotheses of this study to a rigorous test, it would be important to include emotional distress as a predictor to examine whether self-esteem variability is an independent predictor or whether its contribution overlaps with that of emotional distress. The hypothesis is that the measures of self-esteem variability and of emotional distress, although correlated to each other, will make independent contributions to the prediction of emotional reactivity and to levels of affect, especially negative affect.

Popularity and Emotional Responsiveness

Popularity has been an individual difference variable that has received much attention in the area of peer relations. Popular children, as measured by peer group nominations and ratings, are generally viewed as cooperative, friendly, sociable and as sensitive to peers (Newcomb, Bukowski, & Pattee, 1993). Popular children and adolescents are generally skilled at initiating and maintaining positive peer relationships and demonstrate various social skills, such as, for example, the ability to insert themselves unobtrusively into social interactions and accurately read and interpret social cues (see Rubin, Bukowski & Parker, 1998). One of the skills needed to develop and maintain successful peer relationships is the ability to understand the nature of emotions and regulate their intensity, experience and expression in a skilful way within the social context (Eisenberg & Fabes, 1992).

Empirical research suggests that popular children have more developed emotional

regulation and expression skills than their less popular counterparts. Studies found that

children's ability to understand emotions is a predictor of peer acceptance (Cassidy, Parke,

Butkovsky, & Braungart, 1992). Sociometric status (popularity) has been linked to the

low frequency and intensity of negative emotions (Fabes & Eisenberg, 1992), to the

relative high levels of positive affect (Hubbard & Coie, 1994), and to the use of more

effective coping strategies to manage negative emotions after disappointing situations

(McDowell, O'Neil, & Parke, 2000). At the behavioural level, popular children tend to

react to anger provoking peer interactions in assertive ways, especially verbally, and that

compared to their less popular peers, they are less likely to engage in aggressive or overtly

emotional retaliatory behaviours (Fabes & Eisenberg, 1992). Peer-assessed social status is

positively related (concurrently and prospectively) to teacher-assessed emotional

regulation and negatively related to teacher-assessed emotional intensity and peer-assessed

emotional displays of anger and crying (Maszk, Eisenberg, & Guthrie, 1999). In

summary, popularity in children and young adolescents seems to be associated with less

emotional intensity, greater and more effective emotional regulation, and more adaptive

and skilful behavioural displays of emotions when confronted with negative events. Based

on these findings, it is possible to hypothesize that popularity is associated with decreased

emotional responsiveness to events, especially negative ones. With respect to the current

study, one may expect that increased popularity is associated with less intense emotional

reactions and less emotional reactivity following an interpersonal event.

The central question of the current study is whether individual differences in the

variability of self-feelings predict emotional reactivity and whether this effect is independent of emotional distress and popularity. Before discussing the proposed study, it is important to discuss the definition of variability, its measurement and the conceptual and methodological implications of such measures.

Measurement of Variability

Variability can be defined in both conceptual and statistical terms. At a conceptual level, variability involves changes or fluctuations that are temporary and not permanent (otherwise one would have changes in baseline self-esteem, see Rosenberg, 1986) around a typical or average level of a characteristic. Thus, the definition of variability includes the concept of an average or typical level of a characteristic (around which there are changes) and the concept of change through time.

Researchers have measured this variability in two conceptually distinct ways. In the first approach, researchers have based their measure on self-report and made the implicit or explicit assumption that individuals can provide valid and reliable reports on the extent of the fluctuations (or changes) of their self-feelings around a typical level. Rosenberg's Stability of Self Scale (1979) is a five-item paper-and-pencil questionnaire assessing whether adolescents' opinion of themselves changed or tended to remain the same from day to day. The scale shows good reliability. This scale assumes that individuals are aware of the extent and frequency of changes in their self-feelings from a baseline and are willing and able to report such changes. In the case of this measure, because Rosenberg did not collect repeated measures of participants' self-esteem, we do not know to what extent scores on the scale represented actual temporal fluctuations in

self-esteem. For the scale to validly capture variability through time, individuals must be aware of fluctuations, able to compare them to an average level and willing to report them without being unduly influenced by other factors. The accuracy of a self-report measure is likely to depend on the level of cognitive development and ability to introspect of the individual. It is possible that children and adolescents may not always meet the assumptions necessary to provide accurate self-reports. In addition, other factors, such as social desirability or presentational concerns may influence responses in a self-report scale. For example, empirical findings indicate that scores on the Stability of Self scale correlate with scores on measures of social desirability (Kernis, 1993). Overall, the self-report Stability of Self scale can best be seen as a measure of participants' beliefs and perceptions about the temporal changes in their self-esteem, and it reflects the extent to which they are willing to have these changes be known to others.

A second approach in the measurement of temporal fluctuations consists of collecting repeated, naturalistic samplings of the construct for a period of time and then to aggregate them into an index. A statistical summary (usually represented by a standard deviation around a mean value) can provide information on the extent and frequency of changes. There is no assumption made about the individual's ability to notice or report such changes, only the assumption that the individual will provide valid repeated measures of self-feelings. The major drawback is that compared to one-time self-report assessments, this method is more time and energy consuming for both participants and investigators.

Variations of the second method have been used by researchers in the area of self-

esteem variability most notably Michael Kernis and his colleagues (Kernis, Grannemann, & Barclay, 1989). In Kernis' usual procedure, participants are asked to complete a state self-esteem measure (usually, Rosenberg's Self-Esteem Scale) either once or twice a day for one week (occasionally, two weeks). These repeated measures are then aggregated and the standard deviation (around the average) used as an index of variability (Kernis & Waschull, 1995). In the current investigation, the standard deviation of repeated measurements was been adopted as one of the best methods available to measure variability in self-feeling. The issue of the methodology and statistical treatment of repeated measurements will be discussed in more depth later. Next, I will touch upon the notion of measuring a trait-like characteristic (variability in self-esteem) by taking repeated measures of a state.

State-Trait Measurement

The notion of measuring a trait by taking repeated assessments of behaviour (or characteristic) in a variety of situations (states) is not new. Methodologically, the procedure of collecting repeated samples of behaviours in different states (or situations) has often been used to identify underlying constructs (or latent variables) and to partition the variance belonging to the latent variable from the variance belonging to different types of measurement (e.g., states) or random errors. The data collected by these procedures is often analyzed by means of statistical programs designed to handle latent variables designs and multiple observations (e.g., structural equation modeling, Bentler, 1995; see also Collins & Sayer, 2001).

From a theoretical standpoint, measuring a trait by examining states is also not

new although there is controversy around this issue. A trait is defined as the stability of a construct through time, stability itself having been defined by some researchers as the consistency of inter-individual differences in intraindividual change (Nesselroade, 1990, 1991). Studies have found empirical evidence for the temporal stability of traits but also for the lack of such temporal stability or consistency (Mischel & Shoda, 1995). Mischel and Shoda (1995, see also Shoda, Mischel & Wright, 1994) have tried to address these contradictory findings by proposing the Cognitive-Affective Personality System theory (CAPS). They introduce the idea of defining a stable trait within the context of a situation. Personality traits are defined as the consistency (i.e., temporal stability) of interpersonal individual differences in the 'if ... then' response to situations. The emphasis is placed on the stability of a unique pattern of behavioural, cognitive or affective responses within situations, sometimes allowing for diametrically opposite behaviours occurring in different circumstances as the products of the processing of different characteristics of the situations. This model, of course, requires the assessment of various situations and/or the assessment of the same situation at different times.

The pattern of interest in the present context is the variability of self-esteem, defined by variability around a baseline level of self-esteem obtained by repeated assessments. To the extent that assessments are obtained at similar times and in similar circumstances and situations, the differences in the degree of fluctuations may be in good part a reflection of the participants' traits and distinctive patterns of perceiving and reacting (Mischel & Shoda, 1995) and not solely a reflection of the characteristics of the situations (states). For example, some participants will show little or no variation in their

self-reported self-esteem, showing a fairly stable pattern with few or no fluctuations.

Other participants may show large and/or frequent fluctuations, and their pattern will be

characterized by the presence of such changes. The patterns of others will fall between

these two extremes and will be characterized by fluctuations of varying frequency and

degrees. Thus, the cognitive and affective pattern of fluctuating self-feelings across time

is what characterizes the trait for each participant and represents the starting point of this

investigation on the effects of self-esteem variability on emotional reactivity.

Proposed Question

The current study examines the effect of individual differences in variability of self-

esteem on the association between the perception of peer events and specific emotional

reactions (anger, sadness, anxiety and positive affect). Data needed to be collected in a

hierarchical fashion, first at the event level, to gather enough instances to test the

association between the perception of an event and the emotional reaction to it; and

secondly, at the person level, to compare participants on individual or person-level

variables such as variability of self-esteem. Many of the empirical investigations to date

have utilized laboratory situations and/or retrospectively recalled events. In the current

study, multiple assessments of daily occurring events were collected in an ecologically

valid fashion for each participant. Information was collected on various characteristics of

these events and on the immediate emotional reactions to them. For each participant,

individual difference data, including measures of self-esteem variability, was collected.

The multiple assessments of daily events allowed for a test of the association between

characteristics of events and emotional reactions. The individual difference variables, such

as self-esteem variability, were examined for their predictive power on the strength of the association between characteristics of the association and emotional reactions. For each participant, there were two levels of data: repeated measurements of naturally occurring events and emotional reactions to those events, and data collected by means of well-validated, standardized scales in a group testing format (individual differences data).

The best domain to study this phenomenon is the area of peers' social interactions. Peer interactions were chosen specifically as the interpersonal focus because self-esteem variability, as Rosenberg (1986) theorized, is more likely to come into play in an interpersonal versus a non-interpersonal arena such as academic performance. In addition, interactions with peers were chosen over other types of interactions (e.g., with parents or teachers) because of the crucial importance of peer relationships for development during adolescence (Rubin, Bukowski, & Parker, 1998; Sullivan, 1953). Recent theorists on emotions have also highlighted the fundamental importance of social interaction and interpersonal exchanges in the origin, development, experience and expression of emotions (Andersen & Guerrero, 1998).

Measurement Issues

The preferred means of measuring self-esteem variability requires multiple samples of experience that are later aggregated to arrive to an index of variability. The approach of multiple sampling is exemplified by two methods, *time-contingent* and *event-contingent* recording. Within time-contingent recording, two methods predominate. In *interval-contingent* sampling, participants are required to report about their experience or internal states at regular predetermined times, for example, 10 o'clock at night, that often

correspond to specific daily activities, for example, bedtime. Another method, *signal-contingent recording*, is based on the random sampling of time (usually only during waking hours) and requires participants to report on their experiences whenever they are signalled randomly by means of pagers and other devices. Its main advantage over interval-contingent recording is the avoidance of systematic bias involved in assessing behaviour at fixed times of the day (e.g., expectation bias, diurnal variations). On the other hand, this method requires more sophisticated means (e.g., pagers) to signal participants and data collection tends to be more complex, expensive, time consuming and occasionally, more intrusive in participants' lives. The Experience Sampling Method (ESM, Csikszentmihalyi, & Larson, 1987) is an example of signal-contingent recording. ESM has gained increasing popularity as researchers have attempted to investigate in an ecologically valid fashion constructs and behaviours such as mood, physical activity and eating behaviour. The particular stance adopted in this investigation is to consider repeated measurements across time as an empirical way to capture temporal fluctuations in self-esteem in an ecologically valid fashion (Hormuth, 1986). The Time Sampling Method is the best approach to satisfy these requirements.

To examine the effect of self-esteem variability on emotional reactivity, interpersonal events (peer interactions) that will elicit emotional reactions are also needed. To obtain an ecologically valid, representative sample of peer interactions, data were collected by means of self-reports on interactions with friends and peers as soon as the interactions had terminated. Although adolescents spend a good deal of time with their peers, the random signalling conducted four times daily to elicit self-report data on self-

esteem was thought highly unlikely to generate enough instances of peer interactions to have an adequate sample for analyses. What was needed was a method of collecting data that minimized participants' selection and/or recall biases. Event-contingent recording, related to the methods described above, requires participants to complete a form as soon as possible every time an event (meeting a predetermined definition) has occurred, such as, for example, a period of physical exercise (Gauvin, Rejeski, & Norris, 1996). In the case of the current investigation, the target events are peer interactions of at least 15 minutes' duration. To measure the specific characteristic of the interaction (support, conflict, intimacy, etc.), the measure used was the Rochester Interaction Record (RIR) developed and refined by Wheeler and Nezlek (1977; Nezlek, Wheeler, & Reis, 1983). The RIR was developed to investigate social phenomena as they occur in the participants' every-day life, an improvement over retrospective self-report questionnaires (Reis & Wheeler, 1991).

To date, most researchers investigating self-esteem variability have employed measures of global self-esteem or self-worth. However, much theory and research has conceptualized self-esteem as multi-dimensional and hierarchical in nature (Harter, 1985, 1999; Marsh, 1986). Domain-specific self-evaluations have been found to be more closely associated with outcome variables such as emotional well-being, feelings of depression, suicidal ideation, and body image concerns (Harter, 1998, 1999). Thus, a domain-specific measure of self-perceived social competence was chosen as more appropriate for the area of peer interaction than a global measure of self-esteem.

Summary of Present Investigation

To summarize, the present investigation aims to build and extend on past research

and address hypotheses from Rosenberg's theory; specifically, that adolescents with variable self-feelings are more emotionally reactive (defined as a stronger association between the characteristics of the event and the emotional response) than their less variable peers. To date, the current study is the only one to examine this question by means of more complex or appropriate methodology and statistical approaches. The bulk of the research presented has been conducted on adults or college student samples. To date, very few empirical studies have examined variability of self-esteem in children and early adolescents (Rosenberg, 1979; Savin-William & Demo, 1983; Tevendale et al., 1997; Waschull & Kernis, 1996), and none of them, to my knowledge, has examined self-esteem variability or emotional reactivity with an Experience or a Time Sampling Method.

The main goal of the proposed study is to examine the association between variability of self-esteem and emotional reactions to peer interactions events. The proposed study focuses on naturally occurring peer events. The Time Sampling Method was used to collect repeated measures (four times daily for one week) of social self-esteem and mood. Samples of peer interactions were obtained by means of an event contingent recording method. Participants were asked to describe interactions with their peers (of a duration of at least 15 minutes) and provide information on the interaction characteristics and its importance, as well as their emotional reactions following it. Group testing self-report questionnaires were used to obtain information on students' perceptions of their 'typical' self-feelings, emotional well-being and level of self-concept stability. Peer nominations and liking ratings were used to assess popularity and acceptance. Specific emotional reactions to the events were examined as a function of both level and

variability of self-feelings and as a function of correlates of self-feelings variability (e.g., emotional distress) at the same time.

The proposed study makes a number of unique contributions to the extant research. (1) It is the first study to distinguish between the predictive power of variability of social competence, its level, emotional distress and popularity. (2) This is the first study employing the Experience and Time Sampling Method to collected data and examine the association between individual difference variables and emotional reactions to peer interactions. (3) By using Hierarchical Linear Models to examine the repeated data collected, this study allows the partition of within– and between-persons sources of variance to test the significance of proposed variables at different levels. (4) By taking an individual differences approach, it is one of few studies examining the effects of individual differences in self-esteem variability in early adolescence. The study also aims to further knowledge of how adolescents' view of themselves is associated with their emotional responses.

Hypotheses

The study will address a number of hypotheses at different levels. It is important to keep in mind that the measure of self-feelings used is a measure of perceived self-competence. The most important hypotheses about the *association* between the perception of interactions and emotional reactions to them (slope in statistical terms) are as follows:

(1) Based on Rosenberg's theory (Rosenberg, 1986), it is expected that variability is associated with increased emotional reactivity. Greater variability in perceived social

competence is hypothesized to strengthen the association between the perception of the interaction and emotional reactions (negative and positive affect). For example, if the association between the perception of the interaction and feelings of sadness is negative, individuals with variable perceived social competence demonstrate a stronger negative association between their perceptions and sadness than individuals with less variable self-feelings.

(2) Based on the literature linking emotional distress to increased emotional reactivity, it is expected that emotional distress strengthens the association (whether positive or negative) between the perception of the interaction and emotional reactions. It is expected that although related, emotional distress and perceived social competence variability are independent predictors of the strength of the association between perceptions of the interaction and emotional reactions.

(3) Popularity is hypothesized to decrease emotional reactivity, particularly for negative emotions. That is, popularity is expected to act as a "buffer" on the association between the perception of the peer interaction and emotional reactions to it. Popular participants are expected to have a weaker association between their perceptions of the peer interaction and their negative emotional reactions compared to less popular participants.

Another set of hypotheses can be made expanding and replicating empirical research on individual differences in the level of specific emotions and affect (e.g., Kernis & Waschull, 1995; Rosenberg, 1986)

(4) Participants with higher variability in perceived social competence are expected

to report higher levels of negative emotions and lower levels of positive affect.

(5) Participants with lower levels of perceived social competence are hypothesized to experience higher levels of negative emotions and lower levels of positive affect than their peers with higher perceived social competence.

(6) Participants with higher emotional distress, compared to participants with lower emotional distress, are expected to experience higher levels of negative affect and lower levels of positive affect. It is hypothesized that the predictive contribution of these three variables (level of perceived social competence, variability and emotional distress) are largely unique despite their conceptual and empirical association.

(7) Based on research by Kernis, there is reason to expect an interaction between level and variability of perceived social competence in predicting levels of specific emotions such as anger. For example, individuals high in level and in variability of perceived social competence would show higher levels of anger than individuals with a high perceived social competence level but low variability. Individuals with high perceived social competence level and high variability are expected to experience greater levels of positive affect when faced with positive events. Although no specific predictions can be made about the effects of the interaction of level and variability of perceived social competence on the strength of the association between perceptions and emotional reactions, these effects were empirically tested for exploratory purposes.

Regarding individual differences in the perceptions of the importance and the quality of peer interactions, the hypotheses are as follows:

(8) It is expected that participants with a higher level of perceived social

competence view peer interactions more positively than participants with lower perceived social competence.

(9) Replicating previous research on the association between emotional distress and the tendency to perceive events negatively, participants with higher emotional distress are expected to rate their peer interactions more negatively than participants who are not emotionally distressed.

(10) Individuals with high variability in perceived social competence are hypothesized to view their peer interactions as more important than individuals with less variable self-feelings.

Method

Participants

The participants in this study were 166 early adolescent boys (mean age = 14 years and 7 months, SD = 7.5 months), recruited from eight classrooms in grade 8 and 9 of an all male private Catholic high school. Students came from mostly middle-class families of Anglo-Saxon and European (Mediterranean) origin. Participants were recruited in the classroom and their parents were contacted in writing. One hundred and sixty-six students (or 59% of all students contacted) consented to participate in the study and received written parental consent to do so. Of these 166 participants, 144 (or 51% of those contacted) completed the Time Sampling and the Experience Sampling part of the study. The 22 students who had not participated in the Sampling part had all been invited to do so did not take part for a variety of reasons, such as for example, lack of time, lack of

motivation, or sports activities interfering with data collection. Of the 144 participants, 42 provided inadequate or insufficient data based on the criteria described in the data screening section. Analyses were based on 102 participants who met inclusion criteria for valid and reliable data described in a section below. The reliability analyses reported in the next sections are all based on the final set of data of the 102 participants (after screening).

Procedure

Group testing.

Testing took place in two sessions, approximately two weeks apart. The second session was necessary because a few students did not complete all the questionnaires the first time, and other students missed the group testing session altogether. Participants were asked to complete a questionnaire package that included the following measures: (a) Friendship Nominations Scale; (b) Liking Rating Scale; (c) Self-Perception Profile for Adolescents (Harter, 1988); (d) Children's Depression Inventory (Kovacs, 1992); (e) Trait Anxiety Inventory for Children (Spielberger, Edwards, Lushene, Montouri & Platzek, 1973); and (f) Stability of Self Scale (Rosenberg, 1979).

Daily experience sampling.

Following completion of group testing, participants took part in the Daily Experience Sampling part of the study. The Experience Sampling Method (ESM) has been used to study participants' subjective experience by sampling experience systematically while the person is in his or her natural environment (Csikszentmihalyi & Larson, 1987). ESM makes use of instruments, such as a pager, which emits signals to the participants according to a random or predetermined schedule. At the signal,

participants are asked to report on their current situation and psychological state using short self-report questionnaires.

In the present study, the goal was to collect information on adolescents' emotions and affect, self-esteem and perceptions of peer relationships. Pagers were used to send signals to participants and request that they provide self-report information. To optimize the collection of reliable and valid data, and to optimize the instruction of participants and the monitoring of pager use, participants were divided into groups and participated in consecutive data collection periods. During the first, second, third and fourth consecutive week, 40, 48, 30 and 26 participants took part, respectively. Participants were met in small groups of 4 to 12 students during lunch periods or after classes. Each student was given a Daily Experience Booklet composed of identical forms, a pager and spare batteries. They were instructed to carry the pager, booklet and a pen or pencil with them at all times for a week and were given detailed instructions (a copy of which is provided in Appendix A) on how to complete the different parts of the booklet. Participants were asked to fill out a "pager form" as soon as possible after they received a pager signal and were encouraged to be as honest as possible in their responses.

To collect information specifically on peer relationships, participants were asked to fill out a "friend form" (part of the same booklet) after having spent time interacting and/or engaged in an activity (e.g., sports) with friends or peers for at least 10 minutes. A copy of the pager form and of the friend form is provided in Appendix C and D respectively. Participants were encouraged to complete "friend forms" a minimum of two times a day and preferably as many times as they had (distinct) interactions with their

friends. Participants were then asked to practice by filling out one pager form and one friend form during the instruction session; the examiner answered any questions and assured participants of the confidentiality of the information provided. The students were encouraged to contact the investigator by phone at any time if they had any questions or concerns. A written summary of the verbal instructions for each section of the booklet was placed on the first page of the booklet (Appendix A and B). Two participants contacted the investigator: one student lost his pager. It was replaced and the lost pager was found a few days later. Another student's pager malfunctioned and it was replaced the next day. Every student was contacted once during the week to monitor progress and address any concerns or questions.

Participants were paged four times a day for one week (for a total of 28 times). The signals were sent at random times within pre-specified time periods to ensure adequate sampling of time and activities. The time periods were the following: (1) early morning before school between 7:30 am to 8:30 am; (2) lunch time, usually between 11:30 to 1:00 pm; (3) late afternoon after classes, usually between 3:00 to 7:00 pm; (4) evening, between 8:00 and 10:00 pm. Students were not paged during class times as it would have been too disruptive. During weekends when participants were likely to wake up at a later time, they were not paged until 10:55 am at the earliest and the second signal also occurred at a later time, usually between 1:50 to 3:00 pm (except for one week when most students participated in a school-sponsored activity early on Saturday morning). Participants were instructed to turn off the pager at night and to switch the pager off or to vibration mode at any time when they did not want to be disturbed (e.g., at church or in a

movie theatre).

Following the end of each data collection week, the booklet and pager were collected, participants were thanked, paid $10 and given certificates attesting to their participation. Each participant was then asked to complete a short questionnaire regarding his experience (measure described below) and was queried individually about his truthfulness in completing the forms. No problems were reported. All students said that they had usually been truthful when completing the forms.

Group Testing Measures

Positive sociometric nominations.

Participants were asked to name (in descending order of liking) the same-sex peers whom they considered as their friends. Space was provided for 10 nominations and only the names of same-grade participating students could be chosen. Instructions indicated that participants could nominate as many peers as they wished. The number of nomination received was tallied to calculate acceptance scores, which were later standardized within grade. A copy of the positive sociometric nomination questionnaire is provided in Appendix E).

Liking ratings.

Participants were asked to rate on a Likert-type scale ranging from 1 (*not at all*) to 5 (*very much*) how much they liked each of their classmates (among those who had received parental consent to participate). The ratings received by peers were averaged and then standardized within class. Sociometric nominations and liking ratings are widely used and well-validated methods to obtain peer-based measures of the acceptance and

popularity of children and adolescents (Hartup, 1983; Newcomb & Bukowski, 1983;

Rubin, Bukowski & Parker, 1998). A copy of the liking ratings questionnaire is provided

in Appendix F.

Self-Perception Profile for Adolescents.

The questionnaire used is an adaptation of the Self-Perception Profile for

Adolescents (Harter, 1988), a 45-item paper-and-pencil questionnaire that measures

domain-specific judgements of competence and adequacy in seven domains (scholastic,

athletic, physical appearance, social acceptance, behavioural conduct, close friendship,

romantic appeal), as well as a global self-worth scale. The scale has been used in

numerous investigations on self-esteem and has been shown to be a valid and reliable

instrument with adolescent samples (Harter, 1985, 1988). The original format of this

questionnaire was a forced choice between two statements and then a choice about the

extent to which the statement applied to the participant. A pilot study with the original

format revealed that participants had difficulty understanding the instructions, took a long

time to complete the questionnaire and provided data of questionable reliability.

Therefore, the questionnaire was adapted in several ways. First, one of the two stems –

the set originally placed in the left-hand column - was chosen as the question for that item.

One of the sets of stems was chosen because the author had already carefully alternated

positively and negatively worded items to reduce response sets (e.g., all *true*) (Harter,

1988). Second, the wording was changed from 'teenagers' to the first person ("I usually

do the right thing"). Third, the answer format was replaced with a 5-point scale (*false,*

mostly false, maybe, mostly true, true), similar to the scale used in other self-perception

questionnaires (e.g., Marsh, 1988). Lastly, the job competence scale was dropped

because of its limited relevance to the current study and to shorten administration time.

The number of items thus diminished to 40 from the original 45. Participants were asked

to use the scale to indicate to what extent each statement was true of them. The reliability

of the three scales (with 5 items each) retained for the current study was as follows: global

self-worth (Cronbach's alpha = .84), social acceptance (alpha = .85), and close friendship

(alpha = .72). A copy of the measure is provided in Appendix G.

Children's Depression Inventory.

The 24-item scale is based on the 27-item scale measuring a range of depressive

feelings, sad mood, vegetative functions, negative self-evaluation and interpersonal

behaviour (Kovacs, 1992). It was developed for use with grade-school children and

adolescents. Three items were omitted. Item 5 ("I am bad all the time") and 7 ("I hate

myself"), two items tapping into self-devaluation, were omitted to reduce the confound

with self-esteem measures. Item 9 on suicidal ideation was omitted because during

previous data collections, school principals and teachers had expressed the preference to

omit the item. Moreover, this scale was used for research purposes and not to identify or

diagnose depressive illness. For item 24, the word "kids" was substituted by the word

"teenagers" to make the item more acceptable to the adolescent sample. Despite these

changes, the great majority of items were retained and validity of the scale conserved. The

original answer format that requires participants to choose the one statement among the

three that best describes them was retained. Items were scores 1, 2 or 3. Instead of

calculating the sum of item scores as per the manual, it was decided to average them to be

able to combine them with the anxiety scale scores (described in a later section). The

reliability of the scale obtained in the current study was .79. A copy of the inventory is

provided in Appendix H.

Trait Anxiety Inventory for Children.

This 16-item self-report measure is based on the 20-item Trait Anxiety scale of the

State-Trait Anxiety Inventory for Children (STAIC - Spielberger, Edwards, Lushene,

Montouri & Platzek, 1973). The trait scale purportedly measures relatively stable

individual differences in children's anxiety proneness and taps into physiological anxiety,

worry, over sensitivity and social concern. This instrument was chosen because it is a

widely used and well-validated scale tapping into trait characteristics and it is much

shorter than similar scales such as the 37-item Revised Children's Manifest Anxiety Scale

(RCMAS, Reynolds and Richmond, 1985). During pilot testing, the 20-item trait scale

took a long time to complete along with other questionnaires. Thus, it was decided to

shorten it by omitting 4 items - #4, 8, 16 and 18 from the original scale - chosen based on

the lowest item remainder correlation coefficient for the item (see Spielberger et al.,

1973). The original format, in which each item taps the frequency of a symptom along a

three-point scale (*hardly ever, sometimes, often*), was retained. Items were averaged into

a scale score. Reliability (alpha) was .81. A copy of the scale is provided in Appendix I.

Stability of Self Scale.

This five-item scale, adapted from the New York State version of the Stability of

Self scale (Rosenberg, 1979), taps the degree to which self-views are stable across time

and situations. The content of the items was largely maintained, although some adaptation

occurred for items 1 and 2 to match the answer format of the other items (e.g., from

"Does your opinion of yourself tend to change a good deal or does it always continue to

remain the same?" to "My opinion of myself tends to change a good deal instead of always

remaining the same"). The wording for item 4 was also changed from the original "Some

days I have a very good opinion of myself; other days I have a very poor opinion of

myself" to "I change from a very good opinion of myself to a very poor opinion of

myself". For all 5 items, participants were asked to indicate how well each statement

described them using a five-point scale, ranging from 1 (*strongly agree*) to 5 (*strongly*

disagree). Scores were averaged. Higher scores reflected higher levels of stability and

consistency. The reliability (alpha) was .74. A copy of the scale is provided in Appendix J.

Time and Experience Sampling Measures

There were two distinct sets of measures taken for daily records. For the first set

of measures - the 'Pager form' - participants were instructed to respond as soon as

possible following reception of the pager signal. The second set of forms - the 'Peer

interaction form' (abbreviated to 'Friend form') - was completed following an interaction

with a friend or a peer that lasted at least 10 minutes. The two forms were similar in

layout and were based on similar forms developed by Larson (personal communication,

Reed Larson, 1996).

Pager form.

This form was developed mainly to collect information on participants' momentary

self-feelings as they were signalled at random times during the day. The forms also

collected other information not used in the current investigation. Participants were asked

to rate their perceived social competence on three items, worded as follows: (1) I feel well liked, (2) I feel popular, and (3) I feel like I have many friends. The three items were scored on a five-point scale ranging from 1 (*really disagree*) to 5 (*really agree*) and the scale score for perceived social competence was obtained by averaging across the items. The content for the items was drawn from questions in the Social Acceptance and Close Friendship scales of the Self-Perception Profile for Adolescents (Harter, 1988). The wording was changed slightly to emphasize the momentary assessment of one's feelings of competence and the format was changed to a more a rating scale to measure momentary fluctuations instead of the forced choice format. Participants were also asked to provide information on the date, time, location, companions and activity at the time when they were paged (see Appendix C).

The reliability of the perceived social competence scale was actually an average of different reliability scores. Because the multiple data points of each individual (for e.g., at 8 am, 12:00 noon and 3 pm of the first day, 8:15 am on the second day, etc.) were not independent of each other, the assumption about independence of observations needed to calculate Cronbach's alpha was violated. To address this concern, it was decided to use only one observation per participant in any one analysis to calculate alpha. Secondly, alpha would be calculated repeatedly and then the values would be averaged to arrive at a mean value. Separate reliability analyses (shown in Table 1) were conducted on the first ten consecutive data points. The first ten were selected because they were the minimum amount of data needed to retain participants for analysis. The average of the values was .89, with a range from .86 to .91. These high reliability values were favourably

Table 1

Reliability Values (Cronbach's alpha) for the Perceived Social Competence Scale

Data point	Perceived social competence
1	.91
2	.87
3	.86
4	.90
5	.89 [a]
6	.90
7	.90
8	.90
9	.91
10	.90
Average reliability	.89
Number of scale items	3

Note. All Ns = 102.

[a] N = 101.

comparable to the reliability value obtained in the group testing measure of level of perceived social competence level (alpha = .85). It is important to note that the reliability analyses were conducted on the final set of data after screening (described in the data screening section).

After selecting valid data according to criteria explained below, the perceived social competence data was averaged across observations to obtain perceived social competence level and the standard deviation of the repeated measures was used to create the measure of perceived social competence (temporal) variability. The newly created aggregate measure of level of perceived social competence was moderately positively correlated ($r = .64, p < .001$) with the Social Acceptance scale of the Self-Perception Profile for Adolescents (from whose items two were used). The correlation with the Close Friendship scale (on which one of the items was based) was somewhat lower but still significant ($r = .41, p < .001$) as was the correlation with the global self-worth scale ($r = .41, p < .001$). The size of the correlation between the aggregate perceived social competence measure and the group testing measure of social acceptance suggested that, although related, the two measures were not identical. The aggregate measure was chosen for the main set of analyses and, as described later in the text, the analyses were replicated using the group testing measure of social acceptance.

The measure of variability of perceived social competence, congruent with hypotheses and previous studies, was positively correlated with the measure of emotional distress ($r = .40, p < .001$), and negatively correlated with level of perceived social competence ($r = -.50, p < .001$) and with social acceptance ($r = -.44, p < .001$). The

correlation with Rosenberg's Stability of Self Scale was significant ($r = -.37$, $p < .001$).

To explore the nature of the measure of variability in perceived social competence, the data of each participant were divided in to two sets of (chronologically consecutive) odd and even data points. There were 959 and 911 forms respectively (about 9 per participant), with the discrepancy in the numbers due to participants with an odd number of forms. For each participant, the standard deviation of each of the two sets was calculated and the two estimates were correlated. The two measures were highly and positively correlated ($r = .81$, $p < .001$) and suggested that the variability estimates tended to be fairly consistent within people and lend additional support for the use of standard deviation as a measure of variability through time (Kernis, Grannemann, & Barclay, 1989; for opposing point of view, see Larsen, 1987).

An alternative analysis consisted in dividing the data into two roughly equal halves, calculating the standard deviation of perceived social competence of the first and second half of the data and then correlating the two estimates. The two measures were still significantly and positively correlated ($r = .51$, $p < .001$) but less common variance was explained. The correlation suggested that the values for the standard deviation of perceived social competence computed in the first and the second half, although related, differed somewhat. The frequency of the computed values of perceived social competence variability suggested that the values of the standard deviation were higher during the first half of the data collection (mean = .33) than during the second half (mean = .27). This lower vale suggested that as data collection continued, participants showed less variability overall. However, there was more variance in the values for the second half (variance =

.11) than for the first half (variance = .09). Higher variance suggested that in the second

half there was more variability between participants in their index of variability. Thus, one

might speculate that participants differed in the degree to which time and/or the data

collection influenced the variability of their self-ratings.

Friend form.

This form was developed primarily to collect information on participants' activities

with their peers, their perceptions of their interactions and their affective responses

following the interactions. The Friend form was divided into three different sections:

general information, peer interaction characteristics and emotion scales. Other data were

collected but not used in the current study. At the end of each form, space was provided

for participants to make comments or draw cartoons. A copy of the Friend Form is

provided in Appendix D. In the first section, participants were asked to provide

information on the date and time when they completed the form, their location and

companion(s), the main activity in which they had been engaged and what they had been

thinking and/or talking about just prior to completing the form.

In the second section, participants were asked to provide information on their

perceptions of different dimensions of the peer interaction on 7 points scales. The first

item measured the importance of the interaction on a scale ranging from 1 (*not at all*

important) to 7 (*very important*). Participants rated their perceptions of the (a) overall

valence of the interaction on a scale ranging from 1 (*very negative*) to 7 (*very positive*),

(b) level of disagreement (item reversed) ranging from 1 (*low*) to 7 (*high*), (c) support

ranging from 1 (*low*) to 7 (*high*), (d) feelings of acceptance versus rejection (item

reversed), ranging from 1 (*accepted*) to 7 (*rejected*), (e) feelings of closeness, ranging

from 1 (*not at all close*) to 7 (*very close*), (f) degree of group belonging, ranging from 1

(*not at all*) to 7 (*very much*), and (g) the degree to which they talked about personal

things (i.e., disclosure), ranging from 1 (*not at all*) to 7 (*a lot*). A copy of the form can be

seen in Appendix D. The choice of items was based on the Rochester Interaction Record,

a self-report questionnaire used to measure relationship dimensions using an Event

Sampling Method (Nezlek, Wheeler & Reis, 1983), and on previous research on

relationship dimensions relevant to the friendship interactions of adolescents (Bukowski,

Hoza & Boivin, 1994). Although these interaction characteristics tap into different

aspects of peer social interactions, they were thought to reflect the underlying overall

quality of the peer interaction.

Scale reliability was obtained in a similar way to the reliability of self-esteem

measures described in the previous section (see Table 2). Reliability analyses were

conducted on the final set of data after screening (described in a later section). Repeated

reliability analyses were conducted on consecutive data points for the seven-item scale.

However, analyses indicated that the reliability of the Interaction quality scale was

consistently higher if the item on personal disclosure (item g) was omitted (see second

column of Table 2). Given empirical research indicating that personal disclosure may be

less salient and important in male adolescents' interactions than in female adolescents'

interactions (Camarena, Sarigiani & Petersen, 1990; Papini, Farmer, Clark, Micka, &

Barnett, 1990), the item was omitted from the scale and only the first six items were

retained for the interaction quality scale. The average reliability (alpha) of the interaction

Table 2

Reliability Values (Cronbach's Alpha) for the Interaction Quality and Emotions Scales

			Emotions scales			
Data Point	N	Interaction quality[a]	Sadness	Anxiety	Anger	Positive Affect
1	102	.67 (.69)[c]	.89[b]	.73[c]	.85[c]	.78[c]
2	102	.67 (.67)	.87[b]	.80	.85	.74
3	102	.76 (.73)[c]	.85	.69[b]	.87[b]	.80[b]
4	102	.76 (.74)	.82	.75[b]	.91	.84
5	102	.69 (.66)[c]	.87	.75	.83[b]	.76
6	93	.76 (.73)[f]	.86	.81	.88	.84
7	85	.80 (.76)[h]	.85	.72[g]	.88	.78
8	78	.69 (.71)	.92	.80	.86	.71[i]
9	70	.72 (.68)[k]	.83	.70	.89	.73
10	64	.79 (.80)	.83	.62	.88	.83[l]
Average	-	.73 (.72)	.86	.74	.87	.78
Number of items	-	6 (7)	2	3	3	6

[a] The number in brackets refer to the 7-item scale including the personal disclosure item.

[b] N = 101. [c] N = 100. [d] N = 99. [e] N = 91. [f] N = 90. [g] N = 84. [h] N = 82. [i] N = 77. [j] N = 69. [k] N = 67. [l] N = 63. [m] N = 62.

quality scale was .73, with a range from .69 to .80 (see Table 2). It was noteworthy that

reliability values did not decrease noticeably even as the number of observations

diminished.

In the third section, participants were asked to report on their mood by rating how

much they experienced seventeen emotion adjectives using a scale from 1 (*not at all*) to 5

(*a lot*). The emotion adjectives were presented in the following order: (1) angry, (2)

calm, (3) nervous, (4) happy, (5) frustrated, (6) depressed, (7) worried, (8) proud, (9)

irritated, (10) accepted, (11) upset, (12) enthusiastic, (13) sad, (14) ashamed, (15) afraid,

(16) friendly, (17) like hitting someone/something. The items were initially chosen based

on theoretical models and on previously validated scales (Russell, 1980; Watson, Clark, &

Tellegen, 1988). However, one of the shortcomings of these models was the lack of

distinction between types of negative affect items. For the sake of a finer analysis, it was

decided to add enough items to form three distinct negative emotions scales by averaging

across the following items: anger (angry, frustrated, irritated), anxiety (nervous, worried,

afraid), and sadness (depressed, sad).

The positive affect scale was created by averaging across all the positive emotions

(calm, happy, proud, accepted, enthusiastic, friendly). It is important to note that this

scale contained adjectives indicating both high arousal, e.g., enthusiastic, and low arousal,

e.g. calm, from the circumplex model of emotion (Russell, 1980). There were not enough

purely low arousal items to form a reliable scale, but there were enough to form a high

arousal positive emotion scale (*happy, enthusiastic* and *friendly*). When HLM analyses

were conducted solely on this high arousal positive scale, the pattern of results was

identical to that of the combined scale so it was decided to use the scale with the largest number of items.

Scale reliability was obtained in a similar way as the reliability of the interaction quality scale. Repeated reliability analyses were conducted on consecutive data points for each emotion scale and results are presented in Table 2. Reliability analyses were conducted on the final set of data after screening. The average reliability (Cronbach's alpha) of the anger scale was .87 (range .83 to .91); for the anxiety scale, the average reliability was .74 (range .62 to .81), for the sadness scale, the average reliability was .86 (range .82 to .92). The average reliability for the positive affect scale was .78 (range of .71 to .84). These values were well in the acceptable range. It was noteworthy that most of the reliability values remained stable even when based on fewer data points.

Debriefing measure.

As participants returned the pager and completed booklets, they completed a short questionnaire regarding the validity and reliability of their responses. They were asked to answer the following questions: (1) whether they would participate in the study again, (2) how truthful they had been when filling out the forms (choosing among three options: *truthful most or all of the time*, *truthful half or most of the time* and lastly, *I did not take the questions serious and/or I was not truthful*), (3) whether they had learned anything from their experience, (5) how difficult it had been to complete the forms and use the pager, and what problems they had encountered (if any) during their participating in the study. These questions were used to determine the validity and reliability of the data provided. A copy of the measure is presented in Appendix K.

Results

Participant and Data Screening

Before conducting analyses, group testing questionnaires and booklets were screened to eliminate questionable or inadequate data. Inspection revealed that all questionnaires had been completed adequately (apart from a very small amount of missing data on various measures) and were retained for analyses. However, evaluating the quality of the booklet data was a multi-step process in which I chose a conservative approach to ensure the consistency and reliability of the data retained.

Booklet data screening followed a three-step process. First, the data of all participants were inspected to see if participants had followed instructions in general and if the booklets, especially the Pager forms, had been completed properly. Secondly, the data of each participant was examine to determine if he contributed (a) sufficient data to calculate self-feeling variability, and then (b) sufficient data on peer interactions to test the main hypotheses.

First, of the 144 participants, six (or 4%) provided data considered unusable. Three cases were eliminated because participants did not indicate the days and/or times when they completed the forms, thus making it impossible to determine whether they were responding to the signal pages or randomly. Another case was eliminated because more than half of the data were missing in the forms. Two other cases were screened out because the pager forms appeared to have been completed at random times (i.e., times were very different from the signal times) or because the participant was travelling out of the city or did not appear to be taking the study seriously. No participant indicated on the

debriefing questionnaire that he was answering randomly or not taking the study seriously, including the 6 participants eliminated above.

Secondly, participants were selected based on the amount of valid data on Pager forms used to calculate self-feeling variability. The times at which the Pager forms were completed were compared to the times signals were sent to ensure that participants responded within a reasonably short amount of time. Consistent with the procedure adopted by previous investigators (Csikszentmihaly & Larson, 1987; Larson & Csikszentmihaly, 1983), data were retained if the form was completed within 15 minutes of receiving the pager signal. Approximately 90% of a total of 2791 forms were completed within 15 minutes; the mean delay in answering the page was 4 minutes. Data completely after the 15 minutes delay was eliminated from analyses.

Given that the measure of perceived social competence variability consisted of the standard deviation of the perceived social competence measures, it was important to ensure that there was sufficient data for each participant to calculate a representative and reliable index. Participants were retained if they had valid perceived social competence scale data for at least 10 of the maximum of 28 potential data forms (35.7%). Following this criterion, twenty more participants (13.88 %) were excluded because of insufficient data. The criterion used in the current study was more restrictive than Larson's (1989) criterion of 15 out of 49 possible signals but less restrictive than Kernis and colleagues' criterion of 6 out of 8 data points. Given the number of possible data points, the criterion used seemed a reasonable compromise between maximizing the number of participants retained while maintaining representative data for each participant.

Thirdly, participants were selected based on the amount of peer interaction data (i.e., Friend form data) to ensure sufficient data for HLM analyses. Participants had occasionally included interactions with siblings, parents or girlfriends (romantic partners) in the Friend forms. All Friend forms that did not include peers as companions (best friend, friends, or classmates categories) were deleted from analyses. Then, participants were retained if they had valid data in at least five Friend forms (the range was 5 to 25, the average was 11.2 forms per person). Sixteen additional participants (or 11.1 %) were thus eliminated from analyses.

The final number of participants with sufficient data for the HLM analysis was 102, or 70.8 % of the 144 participants who completed the Time and Experience Sampling portion of the study, for a total of 1870 usable Pager forms (average of 18 per participant) and 1144 usable Friend forms (average of 11 per participant). Mean comparisons were conducted to determine if there were differences between the groups of 166 students who initially participated in the study and the 102 whose data were used for analyses. No statistically significant differences were found on any of the group testing measures or in age. Mean comparisons were also conducted on participants who had completed the Experience Sampling and whose data was retained versus those whose data was not. No statistically significant differences were found in age or on any of the group testing measures.

Descriptive Statistics and Measurement Model

Peer interaction activity coding.

The main activity in which participants were engaged was coded into mutually

exclusive categories. The coding system, presented in Appendix L, was based on that used by Reed Larson and his colleagues (Larson, 1989; Larson & Richards, 1991). It consisted of 9 mutually exclusive categories that captured the main activity in which participants had been engaged just before completing the booklet forms. The categories were (1) schoolwork, (2) leisure/hobbies, (3) socializing, (4) sports, (5) maintenance (included sleeping, eating, cleaning, chores), (6) travelling, (7) work or community activities (e.g., volunteering), (8) other activity non-classifiable in the above, (9) missing information. The latter two categories were later combined. Coders were instructed that if two different categories applied to the activity, they were to decide which seemed more important to the participant when completing the form. If it was difficult to give priority to one of the activities, coders were to categorize activities according to a hierarchy described in Appendix L.

Coders were the main investigator and two research assistants who were trained for a total of ten hours on the coding system. After reviewing and discussing the coding system, all three coders coded a portion of the booklets and interrater reliability was calculated with Cohen's Kappa (Kappa is an agreement statistics that corrects for chance agreement; Cohen, 1960). A value over .70 is usually characterized as good (Bakeman & Gottman, 1986). Discrepancies in coding were discussed and resolved during meetings. Based on the inter-rater discussions, the coding system was refined and categories defined more precisely. The three coders continued the training and coding process until inter-rater reliability consistently reached or surpassed a value of .70. The booklets were divided approximately equally between the three coders.

To monitor inter-rater agreement, three sets of thirty booklets were chosen at random and coded by all three coders, two of whom were blind to the reliability checks. A total of 971 forms, or approximately 25% of the total number of pager and friend forms, were used. Following each set of reliability, discrepancies were discussed and resolved before further coding. The agreed-upon final coding was used for data entry. Interrater reliability (kappa) between the three pairs of coders for the first set of booklets ranged from .66 to .82; for the second set, it ranged between .75 and .85; for the third set, it ranged from .88 to .89. When reliability was calculated across all the data, kappa ranged from .78 to .85.

The companions and activities in which the participants were engaged when completing the experience sampling forms are illustrated in Table 3. Participants engaged in a variety of activities with their peers; the most common activity was coded as socializing with friends. Socializing accounted for almost two thirds of the data collected, followed by sports activities and recreational activities such as games or hobbies.

Descriptive statistics.

Table 4 presents the mean and standard deviations of group testing measures, aggregate measures of perceived social competence level and variability and the repeated measures on importance, interaction quality and the emotion scales collected during Experience Sampling. Scores on the depression and anxiety scales were close to 1, the lowest point on the scale. Scores on Stability of Self Scale were above the midpoint of the five-point scale, indicating that on average, participants reported their self-views to be fairly stable across time and situations.

Table 3

Distribution of the Experience Sampling Reports as a Function of Companion, Activity and Day of the Week

Companion	Weekday	Weekend	% Total
Friends	748	214	84.1
Best friend only	87	35	10.6
Classmates	56	4	5.2
Total	891 (77.9)	253 (22.1)	99.9
Activity			
Schoolwork	45	6	4.5
Leisure/hobbies	52	42	8.2
Socializing	591	148	64.6
Sports	89	32	10.6
Self-care and chores	42	9	4.5
Travelling	62	6	5.9
Work/community activities	1	3	0.3
Other/unknown	9	7	1.4
Total	891	253	100.0

Table 4

Descriptive Statistics for Group Testing and Experience Sampling Measures

	N	Weighted means [a]	Unweighted means [b]	Standard deviation	Minimum - Maximum
Mass testing measures					
Acceptance (positive nominations rec'd) [c]	102	NA	0.11	1.04	-2.17 - 2.21
Liking ratings [d]	102	NA	-0.002	.99	-2.68 - 1.89
Depression	102	NA	1.34	.21	1.04 - 2.00
Anxiety	102	NA	1.70	.34	1.00 - 2.50
Stability of self	102	NA	3.22	.80	1.40 - 5.00
Social acceptance	102	NA	3.97	.76	1.60 – 5.00
Aggregate experience sampling measures					
Perc social comp level	102	NA	4.25	.70	2.65 - 5.00
Perc soc comp variab	102	NA	0.35	.29	0 - 1.40
Experience sampling repeated measures					
Importance	1142	4.56	4.56	1.80	1 – 7
Interaction quality	1142	5.54	5.51	1.03	1 – 7
Sadness	1143	1.21	1.20	.58	1 – 5
Anxiety	1143	1.31	1.29	.58	1 – 5
Anger	1143	1.39	1.38	.78	1 – 5
Positive affect	1142	3.62	3.60	.87	1 – 5

a Weighted means based on a different number of observations per participant. b For the calculation of unweighted means, each observation was assumed to be independent and not clustered by participant. c Scores were standardized within grade (2) and then averaged. d Scores were standardized within class (8) and then averaged.

The mean of participants' aggregate of their repeated measures of perceived social competence indicated that, on average, participants felt quite socially competent, although there was a considerable amount of variation among participants in their self-perception. In their average evaluation, participants principally used the top half of the five-point scale (range from 2.65 to 5.00) and only about 20% of participants were at or around the midpoint of the scale (between the anchors *strongly disagree* and *strongly agree*). At the midpoint, participants did not strongly endorse statements of perceived social competence, but neither did they describe themselves as socially incompetent.

The grand mean ratings of importance (not corrected for the different number of observation per participant) indicated that on average, peer interaction events were perceived as important and positive (high levels of support, closeness, belonging, low conflict and rejection). Participants' endorsement of emotion adjectives following peer interactions indicated that on average, they reported low levels of negative emotions and moderately high levels of positive affect.

Table 5 presents the correlations among group testing measures. Scores on the depression and anxiety scales were moderately to highly positively correlated. This correlation suggested that these measures were tapping into the construct of emotional distress (Watson & Clark, 1984) and were averaged into one index. Liking ratings received and acceptance scores were also moderately to highly positively correlated as they were both measures of how liked and accepted each participant was. Liking ratings and acceptance scores were combined into an index of "popularity" by averaging the two standardized scores.

Table 5

Correlations among Group Testing Measures

	Acceptance	Liking ratings	Depression	Anxiety	Self-esteem Stability
Acceptance [a]	1.00				
Liking ratings [b]	.60***	1.00			
Depression	-.03	-.02	1.00		
Anxiety	.01	.01	.66***	1.00	
Stability of self	.13	.13	-.41***	-.53***	1.00
Self-perceived social acceptance	.33**	.40***	-.48***	-.37***	.37***

Note. N= 102. All significance tests are two-tailed.

[a] Positive nominations received. Scores were standardized within grade. [b] Scores were standardized within class.

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

A confirmatory factor analysis (CFA) using structural equation modelling (EQS, Bentler, 1995) was conducted to examine the empirical support to the proposed combination of measures. Results did indeed confirm that this model was a good fit for the data. The chi-square statistics was non-significant (χ^2 (2) = 0.294, p > .10), and the indices of goodness of fit were high (Bentler-Bonett normed fit index was .997, non-normed fit index was 1.053; comparative fit index was 1.00).

Despite being moderately correlated with scores on the depression and anxiety scales, the stability of self scale was maintained to examine its residual explanatory power after the effects of the measure of perceived social competence variability were examined. Not surprisingly, self-perception of social acceptance was moderately positively correlated with liking ratings and acceptance as well as with the stability of self measure. Perceived social acceptance was negatively correlated with depression and anxiety scale scores. The perceived social competence average level was used in the main analyses whereas the self-perceived social acceptance measure was used in a replication of the analyses.

Correlations among group testing and aggregate variables.

As can be seen in Table 6, variability of perceived social competence was moderately negatively correlated with the average level of perceived social competence (r = -.50) and with the group testing measure of social acceptance (r = -.44). As participants rated themselves highly, they tended to show more stability in their ratings. Tevendale and colleagues reported a much lower correlation (r = .09) between stability and trait measures of self-evaluations in the peer domain (Tevendale et al., 1997). Kernis and

Table 6

Correlations among Experience Sampling Aggregate Measures and Group Testing

Measures

	Aggregate measures		Mass testing		
	Perc social comp level	Perc social comp variab	Emotional distress	Popularity	S-E stability
Perc soc comp. level	1.00				
Perc soc comp variab	-.50***	1.00			
Emot distress	-.47***	.40***	1.00		
Popularity	.20*	-.11	-.002	1.00	
Stability of self	.46***	-.37***	-.53***	.15	1.00
Social acceptance	.64***	-.44***	-.45***	.41***	.37***

Note. N = 102. All significance tests are two-tailed.

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

Waschull (1995, p. 96) also reported a lower degree of association – correlations in the

'high .20s' - for measures of global self-esteem. The difference in the size of the

correlations is likely due to a variety of measurement, methodological and statistical

factors. A potential contributor to the high correlation found in this study is the size of the

scale (five points) and the anchors used. The scale may have restricted the effective range

used by participants (ceiling effect) and amplified the correlation between the mean and

the standard deviation. With a much larger scale (10 to 15 points), it may have been

possible to increase variance in the assessments of social competence and perhaps reduce

the correlation between level and variability.

Emotional distress was negatively related to level of perceived social competence

and social acceptance (see Table 6). This finding is consistent with the idea that

adolescents who tend to view themselves more negatively are depressed and anxious

(Harter, 1985; Harter & Whitesell, 1996). Emotional distress was positively correlated

with perceived social competence variability, a finding replicating Rosenberg's (1979)

findings that variability is associated with emotional distress and discomfort. Popularity

was correlated with the aggregate measure of perceived social competence, but only to a

modest degree. Rosenberg's measure of stability of self was positively related to feeling

socially competent and, as predicted, it was negatively related to perceived social

competence variability. The size of the latter correlation (r = -.37) was lower than what

might have been expected given that both measures purportedly tap into variability of self-

feelings. However, there are important differences in the two measures that should be

noted. Rosenberg's Stability of Self measure purportedly taps into variability of the self-

concept whereas the variability measure is specific to the domain of perceived social competence. The two measures also differed in the method used to collect them (one self-report, the other an indirect measure of temporal change), and the degree to which they depended on participant's awareness of change (one solely on self-report, the other as a temporal function of repeated assessments).

Main Analyses

Overview of Hierarchical Linear Modeling.

Experience sampling data can be rich and informative, but poses unique challenges for data analysis. Each participant contributes a different numbers of data points that are generated by the participant him or herself, not by a fixed stimulus as in a crossed design (e.g., participants by experimental condition). These data can be considered as nested within person and conventional multivariate repeated measures designs inadequately address the analysis of such types of data. Hierarchical linear modelling (HLM, Bryk & Raudenbush, 1992), a variant of linear regression, is more suitable for such data. On a statistical level, it takes into account the hierarchical nature of the data and can model effects at different levels of the hierarchy, such as within person and between person effects. The complex issues about the level on which to focus in any one analysis (Larson & Delespaul, 1992) are addressed in an optimal fashion and effects are estimated for each level within the same model. Secondly, HLM makes optimal use of all data, and includes information from all participants, even those who contributed fewer data points and whose data would normally be discarded. Most important from a theoretical standpoint, HLM tries to model individual variation in responses. Individual variation has often been

considered part of the error term and dismissed as 'error variance'.

HLM involves computing linear regressions on regression equations (Arnold, 1992; Bryk & Raudenbush, 1992; Diez-Roux, 2000). There can be two or more levels of analysis, depending on the complexity of the design. In the current study, two levels were of main interest. In the first level, a separate regression equation is calculated for each unit (or person). In the current study, the first level (or unit) of analysis is the peer interaction event. The peer event represents a within-person unit of analysis as each participant provides repeated data on peer interactions (e.g., peer interactions characteristics and emotional responses to the interactions). Before examining the impact of predictors, a so-called 'unconditional model', i.e., a model without predictors (either at level 1 and 2) is run to determine the proportion of within- versus between-persons variance. These data are later used to determine how much variance each predictor explains in its respective equation.

$$Y_{ij} = \beta_{0j} + \beta_{1j} X_{ij} + \varepsilon_{ij} \qquad \varepsilon_{ij} \sim N(0, \sigma^2)$$

In the regression equation above, Y_{ij} represents the outcome variable, for example, sadness, for the ith event (e.g., peer interaction 1, 2, 3, etc.) for the jth participant (e.g., Joe, Mark, Steve, etc.). For each participant, the outcome Y_{ij} is predicted by a regression equation with β_{0j} as the intercept, β_{1j} as the slope, and ε as the level 1 error term. X_{ij} is a level 1 predictor, also a repeated measure, such as the participant's ratings of the valence of the peer interaction. The level 1 errors (ε) are assumed to be independent and normally distributed with a mean of 0 and a variance of σ^2.

The coefficients in the equation, β_{0j} (the intercept) and β_{1j} (the slope) can be considered

fixed or they can vary from one individual to another (hence the subscript j for these

coefficients). A fixed effect at level 1 denotes an effect that is the same for all level 2 units

(in this case, participants). For example, if one defines valence as a fixed level 1 effect (X

$_{ij}$), the model assumption is that the coefficient has roughly the same value for all

participants. If one defines valence as a random level 1 effect, the assumption is that the

coefficient varies randomly across participants. This random variation can subsequently be

modelled in a level 2 equation. Depending on the complexity of the model, multiple level

1 predictors can be tested within the same equation as fixed effect, random effects, non-

random varying effects, or as a combination of all three types. In the current study, the

level 1 models tested included fixed and random effects.

At the second level of the HLM model, each of the regression coefficients defined

in the level 1 equation (β_{0j} and β_{1j}) can be modelled as a function of level 2 predictors that

vary between persons, for example, gender. At level 2, the unit of analysis is the person.

Continuing with the example,

Intercept: $\beta_{0j} = \gamma_{00} + \gamma_{01} W_j + \mu_{0j}$ $\quad$ $\mu_{0j} \sim N(0, \tau_{00})$

Slope: $\beta_{1j} = \gamma_{10} + \gamma_{11} W_j + \mu_{1j}$ $\quad$ $\mu_{1j} \sim N(0, \tau_{11})$

cov $(\mu_{0j}, \mu_{1j}) = \tau_{10}$

The level 1 coefficients - the intercept (β_{0j}) and the slope (β_{1j}) have now become

the outcome variables and W_j has become the level 2 predictor for the level 1 intercept and

slope. For example, in a general 2 level model with one random effect at level 1 and one

level 2 predictor for both the intercept and the slope, there will be two regression

equations at level 2: one equation to predict the intercept (β_{0j}), and one equation to

predict the random slope (β_{1j}). For each regression, two coefficients are estimated: γ_{00} and γ_{01} for the intercept and γ_{10}, γ_{11} for the random slope effect. In the absence of any predictors, γ_{00} represents the grand mean of all observations. The grand mean takes into account the different number of data contributed by each participant by differentially weighting each person's estimated contribution (to the grand mean) by the number of observations provided. If there are predictors, γ_{00} represents the mean after adjusting for the effects of the level 2 predictor W_j. γ_{01} represents the effect of the level 2 predictor W_j on the mean. γ_{10} represents the 'average' slope (after taking into account the level 2 predictor W_j) and γ_{11} represents the effect of the level 2 predictor W_j on the slope coefficient.

In the current study, level 2 predictors consist of individual differences variables such as variability of perceived social competence and popularity. The level 2 errors (μ_{0j} and μ_{1j}) are assumed normally distributed with a mean of 0 and variances of τ_{00} and τ_{11} and covariance τ_{10}. The error μ_{0j} measures the deviation of the intercept of each individual from the overall intercept γ_{00} (grand mean) after accounting for the effect of W_j. Likewise, the error term μ_{1j} measures the deviation of the slope within each individual from the overall slope γ_{10} after accounting for the effects of W_j. τ_{00} and τ_{11} represent the variances of the group intercepts and group slopes after taking into account the effects of the between-person predictor W_j. τ_{01} represents the covariance between intercepts and slopes. For example, if the intercept increases as the slope increases, τ_{01} will be positive. The changes in τ_{00} and τ_{11}, as predictors are added in the equations, can help to quantify effect size, or the proportion of variance explained by different predictors or sets of predictors.

To review with a simple example, consider a level 1 model with sadness as the outcome variable, one level 1 random-effect predictor, valence of the event (X), and one level 2 predictor, popularity (W), entered for both intercept and slope equations. The level 1 model would calculate two random regression coefficients, β_{0j} - the intercept - and β_{1j} - the slope of the association between valence and sadness. In turn, each coefficient can be predicted by popularity - the level 2 predictor. The final, combined model would test four coefficients: (1) whether the intercept of β_{0j} (γ_{00} or the grand mean of sadness) is different from zero, (2) whether popularity has a statistically significant effect on the level of sadness, or intercept (coefficient γ_{01}); (3) whether the intercept (γ_{10}) of the slope (β_{1j}) is different from zero, or, in another words, whether there is a statistically significant association between sadness and valence, and finally, (4) whether popularity has a statistically significant effect (i.e., a moderating effect) on the slope between valence and sadness (coefficient γ_{11}). Calculating changes in τ_{00} and τ_{11} from the unconditional models, that is, the models without any predictors (either at level 1 or 2) can help to quantify the proportion of variance that the predictors at each level explain (effect size). The software program used to analyse the data set was HLM version 5 (Raudenbush, Bryk, Cheong & Cogden, 2000).

Data analysis strategy.

A hierarchical approach (Bryk & Raudenbush, 1992), akin to hierarchical multiple regression, was implemented to analyse each of the outcome variables. The outcome variables were the affect scales created by averaging across items in the experience sampling forms. Separate equations were conducted for the emotion scales of sadness,

anxiety and anger, and for the aggregate of positive affect. There were different steps in the analysis at both level 1 and level 2. In the first step, the equation tested the unconditional model (i.e., without any predictors) and the intraclass correlation was calculated. The intraclass correlation quantifies how much of the variance in the outcome variable can be ascribed to between-person vs. within-person sources. In the second step, day-of-week and time-of-day effects, which were conceptualised as being fixed (i.e., constant across participants), were entered in the equations at level 1. These effects were entered to account for diurnal or day-of-week variations in mood and were assumed to be constant for all participants, consistent with previous empirical research that had found such effects (Gauvin, Rejeski, & Reboussin, 2000; Thayer, 1987) and also because examination of these predictors was secondary in interest to the main hypotheses of the study. For example, for day-of-week effects, it is possible that participants may have experienced increased positive affect (and less negative affect) on weekends than on weekdays regardless of the type and quality of their peer interactions. At each step in the level 1 model, non-significant level 1 effects were deleted from further analyses, following the example of Gauvin et al. (2000).

To test diurnal and day-of-week effects, time and date variables were created based on the data provided by participants when they answered the pager signals. Although diurnal and day-of-week predictors were not expected to be significant once the characteristics of the interactions were entered in the equation, it was important to rule out these potential confounds. To create diurnal variables the time value recorded was first measured on a 24-hour clock (0:00 to 24:00 hours) and then converted into minutes.

Secondly, the time value was centred around 3 pm (15:00). This value was chosen

because it approximated closely the mean of all observations (14:58) and had been

previously used to examine diurnal variations in mood states (Gauvin et al., 2000). To

test quadratic and cubic diurnal mood effects, two additional time variables were created

by squaring the centred value and by obtaining the cube of the centred value. To create

day-of-week effects, a dummy variable was created (0 for weekdays, Monday to Friday,

and 1 for weekends, Saturday and Sunday).

In the third step, the variables of primary interest - the level 1 effects of importance

and interaction quality - were added to the equation as a block. Interaction quality was

entered as a random effect based on previous research and theory. The hypothesis tested

was that participants would differ in the extent to which their emotional reactions were

related to the perceived quality of their peer interaction. For importance, little previous

research had examined this issue and it was decided to empirically test it by entering

importance as a random predictor. It is also important to remember that at all steps in the

model, HLM tests each predictor separately while at the same time controlling for the

effects of other predictors. When interaction quality and importance were entered, they

were centred around each participant's mean. For each participant, the mean was

calculated based on all his repeated measurements, and then this mean was subtracted

from each value for that person, thus obtaining scores high, average or low relative to that

person's own mean. This procedure allowed an easier interpretation of the effects of

(changes in) the perception of importance or interaction quality, given that both of these

effects were now relative to the person's own mean. As indicated by other results

presented in another section, there were between-persons differences in the perceptions of interaction quality and importance. Centering the data around the person's own mean can account for these differences.

In the fourth and subsequent steps, level 2 predictors were entered in the equation to predict, first the intercept, and then, the interaction quality and the importance random slopes. The same predictors were entered in the equations for the intercept and the slope(s) as no previous research indicated a compelling reason to eliminate any predictors from one of the equations. There were six predictors for the random intercept and random slope equations. The first five were (1) variability of, and (2) average level of perceived social competence, (3) emotional distress, (4) popularity and (5) stability of self (i.e., Rosenberg's self-report measure). The final predictor entered was the interaction term between level of perceived social competence (calculated as the average of the repeated measurements) and variability of perceived social competence (the standard deviation). It was added to directly test some of the hypotheses raised by Kernis and his colleagues about the effects of the interaction between level and variability of self-esteem (e.g., Kernis & Waschull, 1995). The two variables were first standardized and then multiplied to compute the interaction term. This procedure followed the practice proposed by Cohen and Cohen (1983) to calculate interaction terms for multiple regression analyses.

The choice of average perceived social competence over the group-testing measure of typical level of perceived social competence was made because, similar to the reasoning made that individuals may not be aware of fluctuations in their self-feelings, it

was possible that individuals may not have been aware of their actual average tone of self-feelings when answering group-testing questionnaires and thus their recollections might have been influenced by recent or salient experiences (Bower, 1981). In the case of the average measure, a random sample of participants' experiences was used to calculate an average representing their level of perceived social competence and reflecting their self-perceptions during the testing week. However, the validity and usefulness of group-testing measures is not in dispute and these measures are also used in the current study. Indeed, in a later section, the main analyses are replicated using the group-testing measure instead of the average of the repeated measures.

Given the high number (18) of potential predictors tested: six level 2 predictors for each of 3 (potential) level 1 random effects (intercept, interaction quality and importance), it was decided to reduce the number of tested effects to try to achieve a balance between comprehensiveness in analyses and empirical usefulness. Only the three level 2 predictors of main interest (perceived social competence level, variability and their interaction) were tested in the slope for importance. This decision was based on (1) the theoretical rationale that the importance predictor was of secondary interest to interaction quality; (2) the measurement consideration that importance, as a one-item measure, was a weaker measure than the multiple-item, empirically reliable interaction quality scale; and (3) statistical considerations about the amount of variance available to be explained in this predictor (as will be described below in the analyses).

These level 2 predictors were entered in a series of steps. In the prediction of the intercept, the first step was to enter perceived social competence variability, followed by

perceived social competence level and then by the variables of emotional distress,

popularity and stability of self. For the prediction of the random slopes of interaction

quality and, if applicable, of importance, the first predictor entered was perceived social

competence variability, followed by perceived social competence level and then in the next

step by emotional distress, popularity and stability of self (the latter three predictors

entered only in the interaction quality equation). Once all the 'main effects' predictors

were entered in the intercept and the slope(s), the interaction term was added to all

equations simultaneously and all predictors were tested together. To facilitate

presentation, only the final model (with significant predictors) is presented in the *Results*

section. The step-by-step analyses are presented in the Appendices.

Sadness.

As mentioned earlier, the sadness scale was obtained by averaging the scores

obtained in the two items *depressed* and *sad*. In the unconditional model (i.e., without

predictors), the level 1 intercept was allowed to vary randomly. The chi-square value of

the variance component of the coefficient indicated significant between subject variation

(χ^2 (101) = 430.28, $p < .001$). The intraclass correlation (ρ) indicated that approximately

25% of the variance in sadness was between-persons and 75 % was within-person.

Level 1 model. The fixed effects of diurnal variation (linear, quadratic and cubic

component) and day-of-week were entered together as fixed effects. Examination of the

fixed effects showed that the diurnal and day-of-week predictors were not statistically

significant (all t (1121) < +/-1.0, $p > .10$). Thus, the time and day-of-week predictors were

eliminated from the equation.

Next, interaction quality and importance were entered as random effects and centred around each participant's mean. Results indicated that the variance component for the regression slope of interaction quality was statistically different from 0 (χ^2(101) = 286.49, $p < .001$), whereas the variance component for the regression slope of importance was not (χ^2(101) = 118.40, $p > .10$). Thus, results suggested that there was random variability in the slope among participants only for interaction quality, and not for the importance slope.

Based on these results, interaction quality was kept as a random predictor and importance was entered as a fixed effect in the final level 1 model illustrated in Table 7. The variance component for interaction quality slope remained significant (χ^2(101) = 346.63, $p < .001$), as did the variance component for the intercept (χ^2(101) = 573.05, $p < .001$). The fixed effect of interaction quality was significant (t (101) = -3.98, $p < .01$), and indicated that the average of the random slopes between perceptions of interaction quality and feelings of sadness was significantly different from zero. The slope coefficient for interaction quality (β_{1j} = - 0.12) was negative and indicated that overall, as participants perceived their peer interaction more positively (i.e., more feeling of support, acceptance, belonging), they experienced less sadness. Conversely, as they perceived the interaction more negatively, they experienced more sadness

The fixed effect of importance was a marginally significant predictor (t (1138) = 1.74, $p < .10$). The slope coefficient for importance (β_{2j} = 0.02) was positive and small in magnitude. The results suggested that as participants perceived the event as more important, they tended to experience a little more sadness. The reliability estimates of the

Table 7

Results for Level 1 Final Model including Random Intercept and Slope for Sadness

Within subject fixed effects	Coeffic.	Stand. error	t-ratio	Df	p-value	Level 1 Var (σ^2)
		Level 1 variance in unconditional model				0.26
Intercept	1.21	0.03	36.04	101	< .001	
Interaction quality	- 0.12	0.03	-3.98	101	< .001	
Importance	0.02	0.01	1.74	1138	.081	
		Level 1 variance after final model				0.20

Estimation of variance components for level 1 predictors

	Parameter	Varian.	St. dev.	χ^2	Df	p-value
Intercept	τ_{00}	0.10	0.31	573.05	101	< .001
Inter. quality slope	τ_{10}	0.05	0.22	346.63	101	< .001

Note. In this model, the assumption of heterogeneity of variance was violated (as

indicated by a significant test of heterogeneity of variance not shown). The fixed effects

estimates are presented with robust standard errors, which are less susceptible to

violations of assumptions.

random coefficients for the intercept (.83) and interaction quality (.51) were high to moderate, indicating that substantial amounts of reliable variance in these two variables could be estimated. The correlation between the random coefficients of intercept and slope was modest (-.33). The level 1 model explained 24.9% of within-person variance.*Level 2 model.* Sets of level 2 predictors were entered in a series of steps to model the random variation first around the intercept and then around the interaction quality slope for the outcome of sadness. Step-by-step analyses are presented in Appendix M and the final set of findings are presented next and illustrated in Table 8. They are also included in an overall summary of results on Table 15.

In the final model for sadness (see Table 8), only significant or marginally significant predictors (based on the step-by-step analyses) were entered. For the intercept, predictors entered were level and variability of perceived social competence and for the slope, level and variability of perceived social competence and popularity. Results indicated that for the intercept, the two strongest predictors were perceived social competence variability (t (99) = 3.64, $p < .01$) and level of perceived social competence (t (99) = 1.93, $p = .05$). Participants who had a higher level of perceived social competence and participants who experienced more variability in their perceived level of perceived social competence reported higher levels of sadness. The interaction between these two predictors was non-significant. Emotional distress did not contribute unique explanatory power to the prediction of level of sadness once the other predictors were entered. The final model explained 14.4% of the between-person variance in the intercept.

In the prediction of the slope, perceived social competence variability was

Table 8

Significant Results for the Prediction of the Intercept and the Interaction Quality Slope

for Sadness

Predictors	Coeff.	Stand. error	t-ratio	Df	p-value	Variance uncond. model (τ_{ij})
Intercept						0.10
Intercept	1.21	0.03	38.78	99	< .001	
Perc soc comp level	0.09	0.04	1.93	99	.053	
Perc soc comp variab	0.48	0.13	3.63	99	.001	
Emotional distress						
Popularity						
Stability of self						
Soc. comp. level x var.						
Interaction quality slope						0.05
Intercept	-0.11	0.03	-4.27	98	< .001	
Perc soc comp level	-0.07	0.05	-1.53	98	.126	
Perc soc comp variab	-0.33	0.15	-2.20	98	.028	
Emotional distress						
Popularity	0.08	0.03	2.22	98	.026	
Stability of self						
Soc. comp. level x var.						
Importance slope						NA
Intercept	0.02	0.01	1.87	1133	.062	

Estimation of variance components after predictors in final model were entered						
	Variance	St. dev.	χ^2	Df	p-value	% explained
Intercept (τ_{00})	0.08	0.29	483.89	99	< .001	14.4
Inter. quality slope (τ_{10})	0.04	0.21	269.43	98	< .001	16.5

Note. In this model, the assumption of heterogeneity of variance was violated (as

indicated by a significant test of heterogeneity of variance not shown). The fixed effects

estimates are presented with robust standard errors, which are less susceptible to

violations of assumptions.

a reliable and significant predictor (t (98) = - 2.20, p < .05). As shown in Figure 1, perceived social competence variability, as expected, was related to a stronger association between the perception of the interaction and emotional reactions of sadness. Participants with the lowest variability in perceived social competence showed very little difference in sadness as a function of interaction quality. In contrast, when an interaction was perceived as negative, participants with more variable perceived social competence reported more feelings of sadness than did participants with less variable perceived social competence. When the interaction was perceived as positive, all participants reported few feelings of sadness.

Popularity was also a significant predictor of the slope of interaction quality (t (98) = 2.22, p < .05). The (final model) positive slope coefficients, illustrated in Figure 2, suggested that popularity played a "buffering" or moderating effect. The (negative) association between the perception of peer interaction quality and feelings of sadness was less pronounced for popular participants than for unpopular ones. In other words, popularity functioned as a "buffer" between one's perceptions of one's peer interactions and one's feelings of sadness. When the interaction was perceived as negative, unpopular participants reported more sadness than their popular peers. When the interaction was positive, unpopular participants experienced less sadness than their popular peers, although it is important to note that, generally, all participants reported little sadness when the interaction was perceived as positive

Finally, level of perceived social competence was marginally significant in earlier analyses but became non-significant in the final set of analyses (t (98) = -1.53, p > .10);
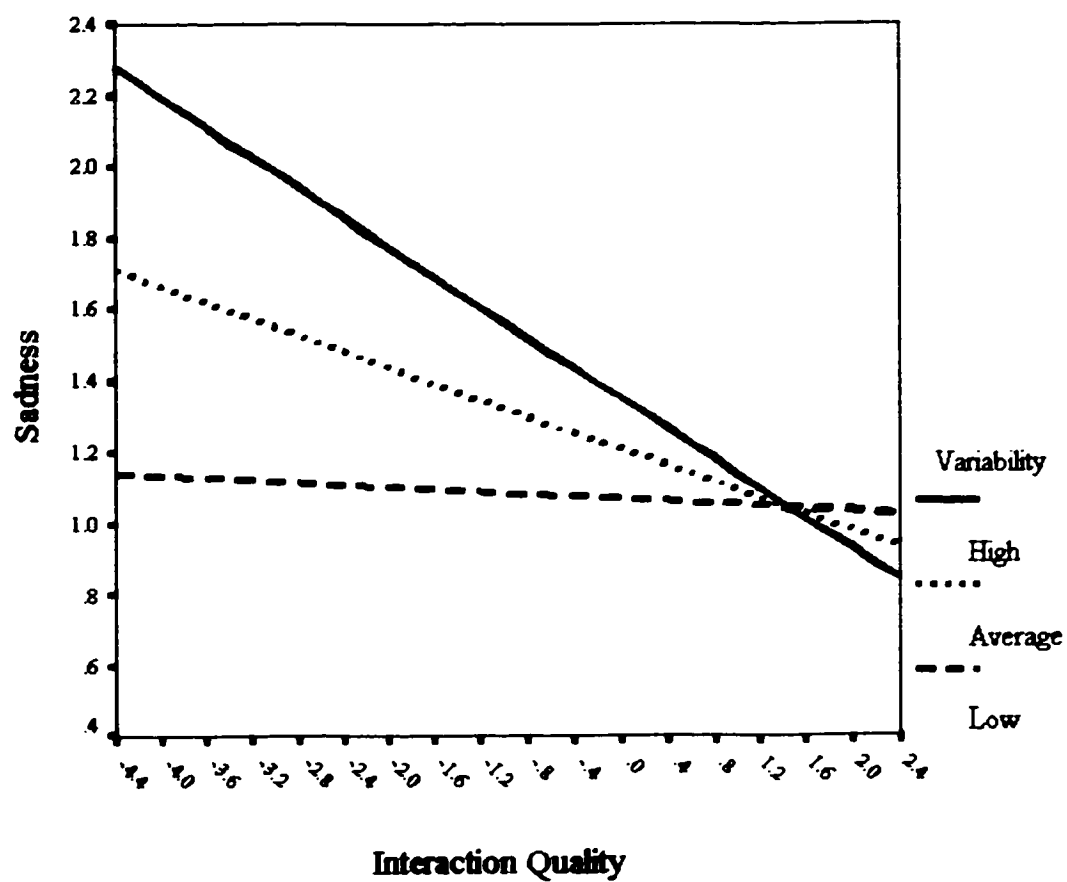
Figure 1. Predicted association between perceptions of interaction quality and feelings of

sadness as a function of perceived social competence variability.
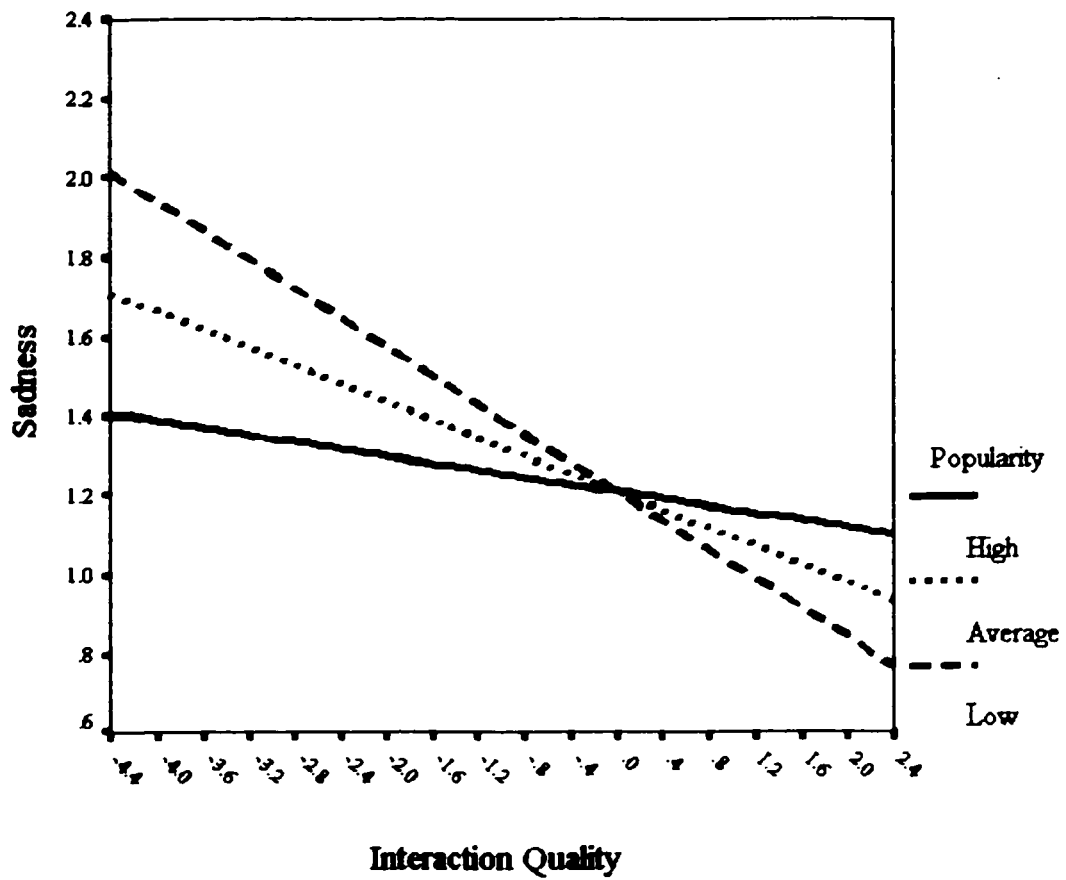
Figure 2. Predicted association between perceptions of interaction quality and feelings of

sadness as a function of popularity.

these findings were not illustrated. The final model explained 16.5% of the between-person variance in the slope of interaction quality. Despite explaining a very respectable amount of variance in the intercept and the slope, the final model left a substantial amount of unexplained variation in both the level and the interaction slope of sadness (shown by the significant Chi-Square statistics at the bottom of Table 8).

Anxiety.

As mentioned earlier, the anxiety scale was obtained by averaging the scores obtained in the items *nervous, worried* and *afraid.* In the unconditional model with a randomly varying intercept, the chi-square value of the variance component of the coefficient indicated significant between subject variability (χ^2 (101) = 431.43, $p < .001$). The intraclass correlation (ρ) indicated that approximately 25% of the variance in anxiety was between subjects.

Level 1 model. The fixed effects of diurnal variation (linear, quadratic and cubic components) and day-of-week were entered together as fixed effects. Diurnal and day-of-week predictors were not statistically significant (all t (1121) < +/- 1.0, $p > .10$) and thus time and day-of-week predictors were eliminated from the equation. Next, interaction quality and importance, both centred around each participant's mean, were entered as random effects. The variance component for the regression slope of interaction quality was statistically significant (χ^2 (101) = 175.74, $p < .05$) and indicated random variability in the slope among participants. However, the variance component for the regression slope of importance was not statistically significant (χ^2 (101) = 113.03, $p > .10$). Examination of the fixed effects showed that interaction quality was a significant predictor (t (101) = -

$3.82, p < .05$) and importance was as well (t (101) = 2.84, $p < .05$).

Thus, in the final level 1 model (illustrated in Table 9), interaction quality was entered as a random effect and importance as a fixed effect. The variance component for the regression slope of interaction quality was statistically significant (χ^2 (101) = 226.43, $p < .05$). The fixed effects were significant for interaction quality (t (101) = -3.72, $p < .05$) and indicated that the slope coefficient for interaction quality (β_{1j} = - 0.11) was significantly different than zero. The negative slope coefficient suggested that as participants perceived their peer interaction more positively (i.e., more feeling of support, acceptance, belonging), they experienced less anxiety. Conversely, as they perceived the interaction more negatively, they experienced more anxiety. The fixed effect for importance was also significant (t (1138) = 2.75, $p < .05$). The slope coefficient (β_{2j} = 0.03) was positive and small in magnitude, suggesting that as participants perceived the event as more important, they tended to experience a little more anxiety.

The reliability estimates of the random coefficients for the intercept (.80) and interaction quality (.45) were moderate to high and the correlation between the two random coefficients was moderately high (-.57). The level 1 model explained approximately 14 % of the within-person variance in anxiety (see Table 9).

Level 2 model. As in the previous analyses, level 2 predictors were entered in a series of steps to first model the random variation around the intercept and then the interaction quality slope. Step-by-step analyses are presented in Appendix N. The findings of the final model are presented below and significant results are summarized in Table 15.

Table 9

Results for Level 1 Final Model including Random Intercept and Slope for Anxiety

Within subject fixed effects	Coeffic.	Stand. error	t-ratio	Df	p-value	Level 1 var (σ^2)
Level 1 variance in unconditional model						0.27
Intercept	1.31	0.03	38.90	101	< .001	
Interaction quality	-0.11	0.03	-3.72	101	< .001	
Importance	0.03	0.01	2.75	1138	.006	
Level 1 variance after final model						0.23

Estimation of variance components for level 1 predictors

	Parameter	Varian.	St. dev.	χ^2	Df	p-value
Intercept	τ_{00}	0.09	0.31	502.52	101	< .001
Inter. Quality slope	τ_{10}	0.04	0.20	226.43	101	< .001

Note. In this model, the assumption of heterogeneity of variance was violated (as indicated by a significant test of heterogeneity of variance not shown). The fixed effects estimates are presented with robust standard errors, which are less susceptible to violations of assumptions.

In the final model for anxiety (shown in Table 10), only significant or marginally significant predictors (based on step-by-step analyses) were entered. Thus, the predictors entered for the intercept were level and variability of perceived social competence and emotional distress and for the slope, level and variability of perceived social competence.

The results indicated that for the intercept of anxiety, perceived social competence variability (t (98) =2.93, p < .01), level of perceived social competence (t (98) = 3.47, p < .05) and emotional distress (t (98) = 3.27, p < .05) were all significant and unique, i.e., independent predictors of variance in the intercept. Contrary to expectations, participants who had a higher level of perceived social competence reported higher levels of anxiety. Likewise, participants with more variability in their perceived social competence and participants who were more emotional distressed reported higher levels of anxiety.

In the prediction of the slope, the only consistently significant predictor was perceived social competence variability (t (99) = -2.57, p < .05). This effect is virtually identical to the effect of perceived social competence variability for sadness (see Figure 3). It indicated that perceived social competence variability was related to a stronger negative association between the perception of the interaction and emotional reactions of anxiety. When the interaction was perceived as negative, participants with higher variability in perceived social competence reported more anxiety than participants with less variability. When the interaction was perceived as positive, there were no significant differences between participants as a function of variability.

As in the previous analyses, level of perceived social competence continued to be marginally significant (t (99) = -1.65, p < .10) but was not interpreted. The final model

Table 10

Significant Results for the Prediction of the Intercept and the Interaction Quality Slope

for Anxiety

Predictors	Coeff.	Stand. error	t-ratio	Df	p-value	Variance uncond. model (τ_{ij})
Intercept						0.09
Intercept	1.31	0.03	42.86	98	< .001	
Perc soc comp level	0.18	0.05	3.47	98	.001	
Perc soc comp variab	0.34	0.12	2.93	98	.004	
Emotional distress	0.44	0.13	3.27	98	.001	
Popularity						
Stability of self						
Perc soc comp lev x var						
Interaction quality slope						0.04
Intercept	-0.11	0.03	-3.97	99	< .001	
Perc soc comp level	-0.07	0.04	-1.65	99	.098	
Perc soc comp variab	-0.23	0.09	-2.57	99	.011	
Emotional distress						
Popularity						
Stability of self						
Perc soc comp lev x var						
Importance slope						NA
Intercept	0.03	0.01	2.79	1133	.006	

Estimation of variance components after predictors in final model were entered						
	Variance	St. dev.	χ^2	Df	p-value	% explained
Intercept (τ_{00})	0.08	0.28	429.45	98	< .001	18.3
Inter. quality slope (τ_{10})	0.04	0.19	210.53	99	< .001	8.9

Note. In this model, the assumption of heterogeneity of variance was violated (as indicated by a significant test of heterogeneity of variance not shown). The fixed effects estimates are presented with robust standard errors, which are less susceptible to violations of assumptions.
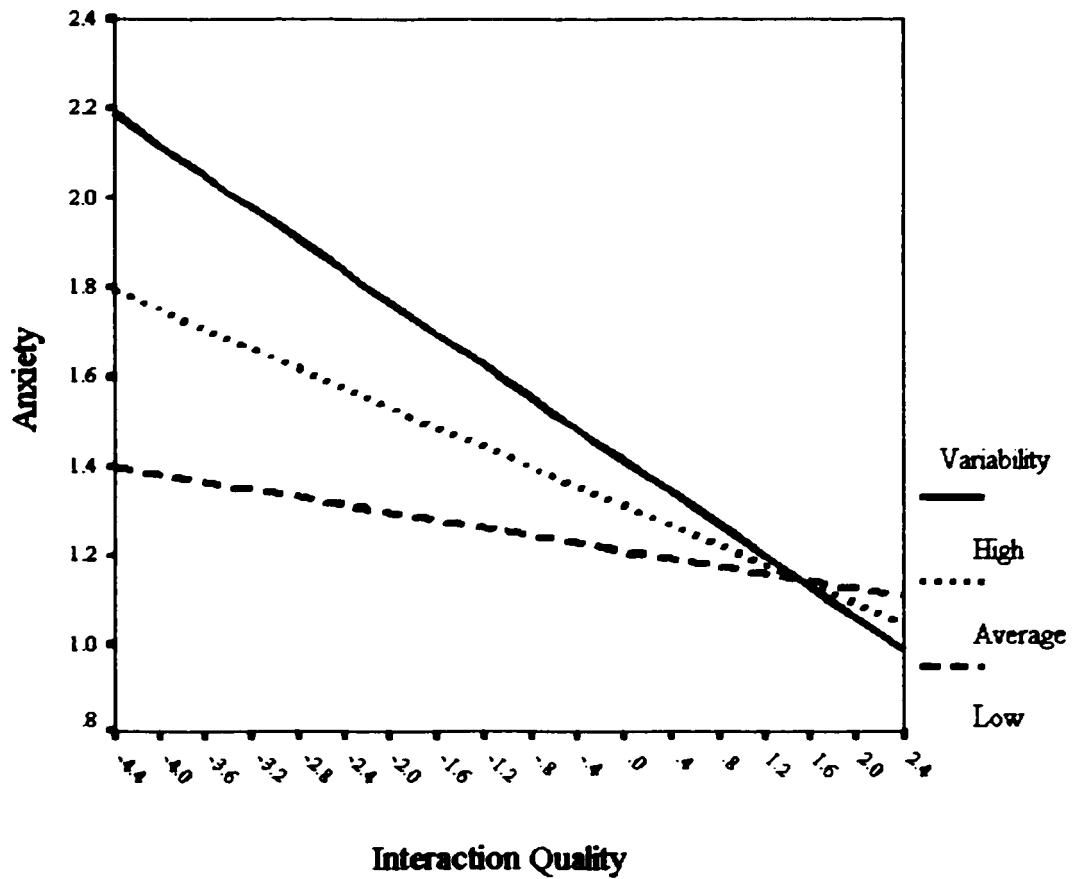
Figure 3. Predicted association between perceptions of interaction quality and feelings of anxiety as a function of perceived social competence variability.

explained 18.3% of the variance in the intercept and 8.9% of the variance in the interaction slope. Once more, the model left considerable unexplained variance in both the level and the slope of anxiety.

Anger.

As mentioned earlier, the anger scale was obtained by averaging the scores obtained in the items *angry, frustrated* and *irritated.* In the unconditional model with a randomly varying intercept, the chi-square statistic indicated significant between-subject variance in the intercept coefficient (χ^2 (101) = 302.65, $p < .001$). The intraclass correlation (ρ) indicated that approximately 16% of the variance in anger was between-person and 84% was within-person.

Level 1 model. The fixed effects of diurnal variation (linear, quadratic and cubic component) and day-of-week were entered together as fixed effects. Examination of the fixed effects showed that the day-of-week predictor was statistically significant (t (1136) = - 2.87, $p < .05$) and that the linear component of the time variable was marginally significant (t (1136) = -1.79, $p < .10$). The quadratic and cubic time variables were not statistically significant (t (1136) = - 0.62, $p > .10$; t (1136) = 1.40, $p > .10$, respectively) and were eliminated from the equation.

Next, importance and interaction quality, both centred on each participant's mean, were added as random effects. Examination of the fixed effects showed that interaction quality (t (101) = -8.85, $p < .05$) and importance (t (1121) = 2.31, $p < .05$) were significant predictors. Day-of-week and the linear time component were no longer significant predictors (t (1136) = -1.11, $p > .10$; t (1136) = 0.74, $p > .10$, respectively) and

were eliminated. The variance component for the regression slope of interaction quality was statistically significant (χ^2 (101) = 284.67, $p < .05$) and indicated the presence of random variance. The slope coefficient for interaction quality was negative ($\beta_{1j} = -0.35$) and suggested that as participants perceived their peer interaction more positively, they reported less anger.

The variance component for the importance slope was significant (χ^2 (101) = 284.67, $p < .001$) and indicated random variability around the slope, unlike previous results for sadness and anxiety. The slope coefficient for importance was positive and small in magnitude ($\beta_{2j} = 0.04$). It suggested that as participants perceived the event as more important, they tended to report more anger. The final level 1 model (see Table 11) explained a large proportion (43.7 %) of the within-person variance in anger.

The reliability estimates of the random coefficients for the intercept (.80), interaction quality (.50) and importance (.28) were modest to high. The reliability for importance was low and suggested that little reliable variance was available to be explained by level 2 predictors and this was an additional reason for limiting the number of level 2 predictors for the importance slope to three. The correlation between the random coefficients of the intercept and the interaction quality slope was high (-.82). Between the intercept and the importance slope, the correlation was modest at .38; between the interaction quality and importance slope coefficients, the correlation was -.31.

When the correlation between two random coefficients is high (above .85), it raises the possibility of multicollinearity, i.e., two coefficients measure practically the same phenomenon. One solution is to eliminate one of the predictors or to combine predictors.

Table 11

Results for Final Level 1 Model Including Random Intercept and Slopes for Anger

Within subject fixed effects	Coeffic.	Stand. error	t-ratio	Df	p-value	Level 1 var (σ^2)
		Level 1 variance in unconditional model				0.51
Intercept	1.39	0.04	36.38	101	< .001	
Interaction quality	-0.35	0.04	-9.07	101	< .001	
Importance	0.04	0.02	2.24	101	.025	
		Level 1 variance after final model				0.29

Estimation of variance components for level 1 predictors

	Parameter	Varian.	St. dev.	χ^2	Df	p-value
Intercept	τ_{00}	0.12	0.35	537.71	101	< .001
Inter. quality slope	τ_{10}	0.09	0.30	287.91	101	< .001
Importance slope	τ_{20}	0.01	0.09	147.99	101	.002

Note. In this model, the assumption of heterogeneity of variance was violated (as indicated by a significant test of heterogeneity of variance not shown). The fixed effects estimates are presented with robust standard errors, which are less susceptible to violations of assumptions.

In the case of the current level 1 model, however, it would have been very difficult to eliminate either the intercept or the slope because the basic hypotheses in the study could not have been tested and also because it would have made interpretation of results more difficult. Hence it was decided to keep both the intercept and the slope coefficients in the equations while bearing in mind their association and the possibility that entering predictors in one equation could affect the results in the other equation.

Level 2 model. The level 2 predictors were entered in the equations for the prediction of the three random level 1 predictors: intercept, interaction quality slope and importance slope. Step-by-step analyses are presented in Appendix O and final results are presented below. Significant results are summarized in Table 15.

In the final model for anger, shown in Table 12, only significant or marginally significant predictors were entered. For the intercept, the predictors entered were perceived social competence level, perceived social competence variability and emotional distress, and for the interaction quality slope, it was emotional distress. No significant predictors were found and thus entered for the importance slope. As shown in earlier analyses for the intercept, perceived social competence variability (t (98) = 3.87, $p < .05$), level of perceived social competence (t (98) = 2.33, $p < .05$) and emotional distress (t (98) = 2.39, $p < .05$) remained significant and unique predictors. Participants who viewed themselves as having more perceived social competence, who experienced greater variability in their level of perceived social competence and who were emotionally distressed all reported higher levels of anger. This pattern of results, similar to that for anxiety, is noteworthy because these significant tests denote unique effects.

Table 12

Significant Results for the Prediction of the Intercept, the Interaction Quality and the

Importance Slopes for Anger

Predictors	Coeff.	Stand. error	t-ratio	Df	p-value	Variance uncond. model (τ_{ij})
Intercept						0.12
Intercept	1.38	0.03	40.16	98	< .001	
Perc soc comp level	0.11	0.05	2.33	98	.020	
Perc soc comp variab	0.41	0.11	3.87	98	< .001	
Emotional distress	0.37	0.16	2.39	98	.017	
Popularity						
Stability of self						
Perc soc comp lev x var						
Interaction quality slope						0.09
Intercept	-0.36	0.04	-9.36	100	< .001	
Perc soc comp level						
Perc soc comp variab						
Emotional distress	-0.32	0.15	-2.17	100	.030	
Popularity						
Stability of self						
Perc soc comp lev x var						
Importance slope						0.01
Intercept	0.04	0.02	2.20	101	.028	
Perc soc comp level						
Perc soc comp variab						
Perc soc comp lev x var						

Estimation of variance components after predictors in final model were entered						
	Variance	St. dev.	χ^2	Df	p-value	% expl'd
Intercept (τ_{oo})	0.10	0.31	460.20	98	< .001	18.3
Inter. quality slope (τ_{10})	0.09	0.29	268.77	100	< .001	4.5
Importance slope (τ_{20})	0.01	0.09	147.99	101	.002	0.0

Note. In this model, the assumption of heterogeneity of variance was violated (as

indicated by a significant test of heterogeneity of variance not shown). The fixed effects

estimates are presented with robust standard errors, which are less susceptible to

violations of assumptions.

In the prediction of the interaction quality slope, the only consistently significant predictor was emotional distress (t (100) = -2.17, $p < .05$) and contrary to expectations, social competence variability was not a significant predictor. As illustrated in Figure 4, participants who were emotionally distressed had a stronger (negative) association between their perceptions of the interaction and feelings of anger. More specifically, when the interaction was perceived as negative, emotionally distressed participants reported more anger than did participants who were not emotionally distressed. When the interaction was perceived as positive, all participants reported low level of anger and there were no differences between participants high or low in emotional distress. The model explained 18.3% of the between-person variance in the intercept, 4.5% of the between-person variance in the interaction quality slope and no variance in the importance slope. The final model left significant amounts of unexplained variance in each equation.

Positive Affect.

As mentioned earlier, the positive affect scale was obtained by averaging the scores obtained on all positive emotions items, namely *calm*, *happy*, *proud*, *accepted*, *enthusiastic* and *friendly*. In the unconditional model with a randomly varying intercept, the chi-square statistic indicated significant between-person variance in the intercept coefficient (χ^2 (101) = 846.15, $p < .001$). The intraclass correlation (ρ) indicated that 39.3 % of the variance in positive affect was between-person (and 60.7% within person), a larger proportion than was the case for anxiety, sadness and anger. This difference suggested that the experience of positive affect tends to be more of a dispositional characteristic than the experience of negative emotions.
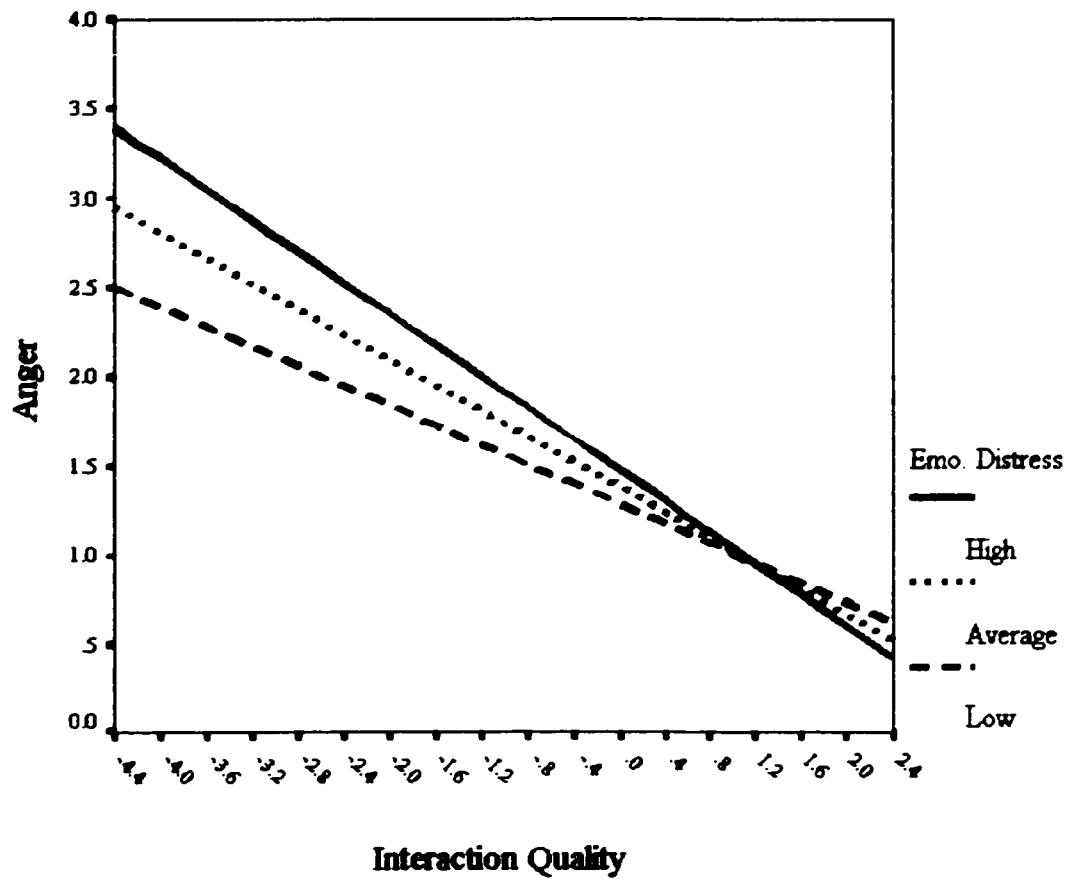
Figure 4. Predicted association between perceptions of interaction quality and feelings of

anger as a function of emotional distress.

Level 1 model. The fixed effects of diurnal variation (linear, quadratic and cubic component) and day-of-week were entered together as fixed effects. Examination of the fixed effects showed that the day-of-week predictor was statistically significant (t (1135) = 2.78, $p < .01$). The linear, quadratic and cubic time variables were non-significant predictors (all t (1120) < 1.0, $p > .05$) and were subsequently eliminated.

Next, interaction quality and importance random effects, both centred on each participant's mean, were added. Examination of the fixed effects showed that interaction quality was a significant predictor (t (101) = 14.36, $p < .01$). The slope coefficient for interaction quality ($\beta_{1j} = 0.43$) was positive and suggested that the more positively participants perceived their peer interaction (i.e., more feeling of support, acceptance, belonging), the more positive affect they reported. Conversely, as they perceived the interaction more negatively, they reported less positive affect. The variance component for its regression slope was statistically significant (χ^2 (101) = 164.79, $p < .01$), indicating random variability in the interaction quality slope among participants.

The fixed effects showed that importance was not a significant predictor (t (101) = -0.89, $p > .05$), unlike the results for the emotions of sadness, anxiety and anger. As shown in Table 13, the slope coefficient ($\beta_{2j} = -0.01$) between importance and positive affect indicated that, on average, the association was not significantly different from zero. However, the variance component for its regression slope was statistically significant (χ^2 (101) = 145.45, $p < .01$) and indicated random variability in the importance slope that could in turn be modelled by level 2 predictors. This result suggested that the association between importance and positive affect was positive for some participants, and negative

Table 13

Results for Final Level 1 Model Including Random Intercept and Slopes for Positive

Affect

Within subject fixed effects	Coeffic.	Stand. error	t-ratio	Df	p-value	Level 1 Var (σ^2)
		Level 1 variance in unconditional model				0.46
Intercept	3.62	0.06	62.81	101	< .001	
Interaction quality	-0.43	0.03	14.43	101	< .001	
Importance	-0.01	0.01	-0.72	101	.473	
			Level 1 variance after final model			0.29

Estimation of variance components for level 1 predictors

	Parameter	Varian.	St. dev.	χ^2	Df	p-value
Intercept	τ_{00}	0.31	0.56	1345.24	101	< .001
Inter. quality slope	τ_{10}	0.03	0.17	167.41	101	< .001
Importance slope	τ_{20}	0.01	0.08	146.14	101	.002

Note. In this model, the assumption of heterogeneity of variance was violated (as indicated by a significant test of heterogeneity of variance not shown). The fixed effects estimates are presented with robust standard errors, which are less susceptible to violations of assumptions.

for others. After entering the two new predictors, the day-of-week predictor became non-significant (t (1136) = 1.31, $p > .05$) and was eliminated from the equation (see Table 13).

The reliability estimates of the random coefficients for the intercept (.91) were high whereas the reliabilities for the random coefficient of interaction quality (.29) and importance (.23) were lower but still acceptable. The correlation between the random coefficients of between intercept and interaction quality was -.07; between the intercept and importance was .36, and between interaction quality and importance it was -.28. The final level 1 model, shown in Table 13, explained a large proportion (37 %) of the within-person variance in positive affect.

Level 2 model. As the previous analyses, level 2 predictors were entered in the equations for the intercept, the interaction quality slope and the importance slope for positive affect. Step-by-step analyses are presented in Appendix P and the final model is presented below. Significant results are summarized in Table 15.

In the final model for positive affect (see Table 14) level of perceived social competence and emotional distress were the only two predictors entered for the intercept and they remained both significant (perceived social competence level: t (99) = 2.90, $p <$ .01; emotional distress, t (99) = - 3.88, $p < .01$. Participants who perceived themselves as being more socially competent experienced more positive affect following peer interactions; conversely, individuals who perceived themselves as less socially competent experienced less positive affect. Individuals who were more emotionally distressed experienced less positive affect following peer interactions. These two effects were unique and independent of each other.

Table 14

Significant Results for the Prediction of the Intercept, the Interaction Quality and

Importance Slopes for Positive Affect

Predictors	Coeff.	Stand. error	t-ratio	Df	p-value	Variance uncond. model (τ_{ij})
Intercept						0.31
Intercept	3.62	0.05	72.61	99	< .001	
Perc soc comp level	0.23	0.08	2.90	99	.004	
Perc soc comp variab						
Emotional distress	-0.70	0.18	-3.87	99	< .001	
Popularity						
Stability of self						
Perc soc comp lev x var						
Interaction quality slope						0.03
Intercept	0.42	0.03	15.10	98	< .001	
Perc soc comp level	-0.00	0.04	-0.04	98	NS	
Perc soc comp variab	0.09	0.13	0.75	98	NS	
Emotional distress						
Popularity						
Stability of self						
Perc soc comp lev x var	-0.05	0.02	-2.12	98	.034	
Importance slope						0.01
Intercept	-0.01	0.01	-0.75	98	NS	
Perc soc comp level	0.02	0.02	1.07	98	NS	
Perc soc comp variab	-0.01	0.05	-0.18	98	NS	
Perc soc comp lev x var	0.02	0.01	2.45	98	.014	

Estimation of variance components after predictors in final model were entered						
	Variance	St. dev.	χ^2	Df	p-value	% expl'd
Intercept (τ_{00})	0.23	0.48	1007.00	98	< .001	26.0
Inter. quality slope (τ_{10})	0.03	0.16	154.48	100	< .001	8.7
Importance slope (τ_{20})	0.01	0.07	135.61	101	.007	9.4

Note. In this model, the assumption of heterogeneity of variance was violated (as

indicated by a significant test of heterogeneity of variance not shown). The fixed effects

estimates are presented with robust standard errors, which are less susceptible to

violations of assumptions.

For the interaction quality slope and the importance slope, the fully saturated

model had shown that the interaction term was a significant predictor for the two slopes.

Thus, the predictors entered were the interaction terms of level times variability, together

with their main effects predictors of perceived social competence level and variability. For

the interaction quality slope, the interaction term of level and variability of perceived social

competence was significant (t (98) = -2.12, $p < .05$), but neither perceived social

competence variability (t (98) = 0.75, $p > .05$) nor perceived social competence level were

significant (t (98) = - 0.04, $p > .05$). Interestingly, when perceived social competence

variability was entered alone, it was significant and explained 8.4% of the variance in the

interaction slope. The significant interaction term is illustrated in Figure 5, with

participants with high perceived social competence level shown in the top graph,

participants with average competence level in the middle and those low in competence

level in the bottom graph.

As illustrated in the figure, there was a positive association between perception of

interaction quality and positive affect at all levels of perceived social competence.

Consistent with hypotheses, individuals with high variability had the steepest slopes, i.e.,

the strongest association between interaction quality and positive affect. In other words,

participants with higher perceived social competence variability, compared to peers with

lower variability, tended to experience more positive affect when the interaction was

perceived as positive, and less positive affect when the interaction was perceived as

negative. The effect of variability, however, was barely noticeable (and probably not

significant) for individuals with high levels of perceived social competence (top graph),
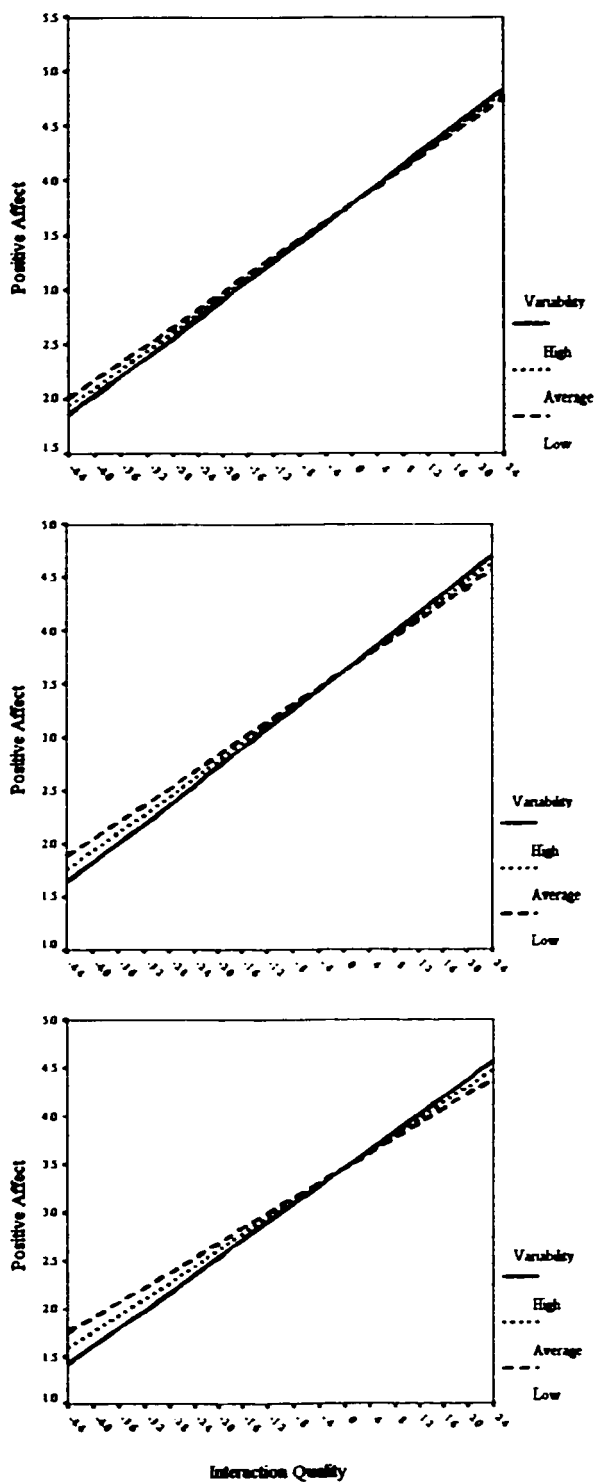
Figure 5. Predicted association between perceptions of interaction quality and positive affect as a function of perceived social competence variability for participants with high (top), average (middle) and low levels (bottom graph) of perceived social competence.

whereas the effect was more noticeable at average or lower levels of perceived social competence (bottom graph).

Level of perceived social competence thus appeared to act as a moderator in the association between variability and positive affect. When participants perceived themselves as socially competent, variability has little impact on their feelings of positive affect, which were largely influenced by their perception of the interaction. When participants perceived themselves as having less perceived social competence, variability had more of an impact: high variability individuals reported less positive affect in a negative interaction and more positive affect in a positive one; individuals with low variability experienced the opposite.

It is important to keep in mind, however, that the interaction effect was small in scope and that the interaction by itself explained 8.7% of the variance in the interaction quality slope, a modest increase from the amount explained by variability alone as a predictor (8.4%).

In the prediction of the importance slope, the interaction term of level and variability of perceived social competence was also significant (t (98) = 2.45, $p < .05$). Neither perceived social competence variability (t (98) = -0.18, $p > .05$) nor perceived social competence level as 'main effects' were significant (t (98) = 1.07, $p > .05$). The results, illustrated in Figure 6, show the slopes as a function of variability (either high or low) for the three levels of perceived social competence (high, average and low).

The association between importance and positive affect seemed quite different both as a function of level of perceived social competence, and as a function of variability
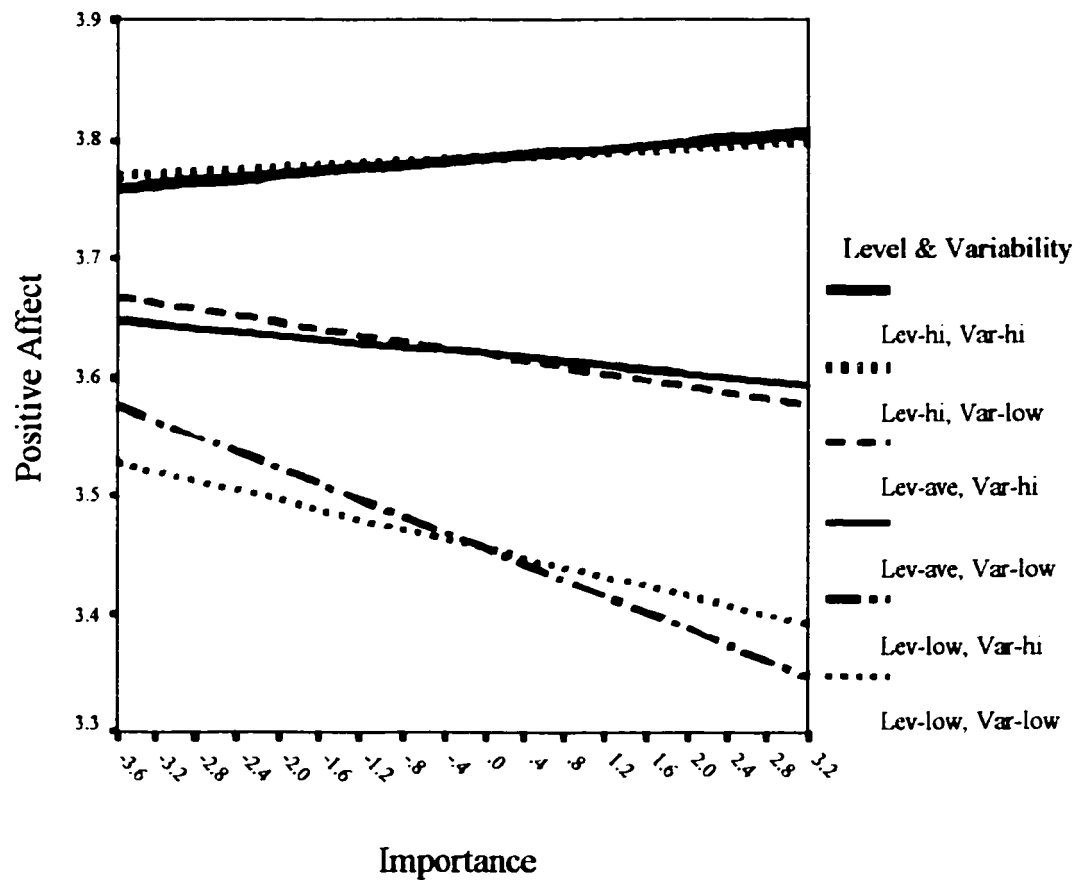
Figure 6. Predicted association between perceptions of importance and positive affect as

a function of perceived social competence variability for participants with high, average

and low levels of perceived social competence.

within some levels of perceived social competence. When participants perceived themselves as socially competent (top two lines in grey), there was virtually no difference between participants high and low in variability: they all reported slight (likely not significant) increases in positive affect as they perceived the interaction more important. When participants perceived themselves as average in their perceived social competence (two lines in the middle of the graph), they generally reported a little less positive affect as the interaction became more important. However, participants high in variability had, consistent with the hypotheses, a steeper slope (or stronger association) between perception of importance and positive affect. It was unclear, however, whether the difference between high and low variability participants was significant.

When participants perceived themselves as low in perceived social competence (bottom two lines in the graph), they reported less positive affect overall than individuals either average or high in perceived social competence. For them, level of positive affect was negatively related to importance (negative slope), that is, the more important the interaction, the less reported positive affect and vice versa. Once more, participants with high variability had the steepest slopes: compared to their peers with low perceived social competence and low variability, they showed less positive affect when the interaction was positive and more positive affect when the interaction was negative.

Taken together, these results suggested that perceived social competence variability played a more significant role for individuals with low (or average) perceived social competence than it did for participants high in perceived social competence. It provided additional support for variability being associated with greater reactivity,

particularly for low perceived social competence individuals.

The final model explained 26 % of the variance in the intercept, 8.7 % of the variance in the interaction quality slope and 9.4% of the variance in the importance slope. Nevertheless, it still left a significant amount of unexplained variance in each of the equations (see Table 14). In summary, the final results for the equation modeling of positive affect indicated that the most consistent predictors of the level of positive affect were higher perceived social competence level and low emotional distress. Level and variability of perceived social competence interacted to predict (1) the association between interaction quality and positive affect and (2) the association between importance and positive affect. The final findings are included in Table 15, which summarizes the results by listing significant predictors and the proportion of variance explained in an easy-to-read format.

Individual differences in the perception of the interaction.

The final set of analyses was conducted to examine hypotheses regarding individual differences in the perceptions of the quality of the interaction and the perception of its importance. Thus, interaction quality and importance - previously level 1 predictors - became outcome variables. The level 2 variables (individual differences or between-persons) were the only predictors used and, as in the main set of analyses, they were, in order of entry: (1) perceived social competence variability, (2) perceived social competence level, (3) emotional distress, popularity and stability of self and (4) interaction term (variability multiplied by level of perceived social competence).

Table 15

Summary of Results for the Emotion Scales

	Emotion scales			
Predictors	Sadness	Anxiety	Anger	Positive Affect
Between-persons variance (%)	25	25	16	39
Intercept				
Intercept	S +	S +	S +	S +
Perc soc competence level	S +	S +	S +	S +
Perc social comp variability	S +	S +	S +	
Emotional distress		MS +	S +	S –
Popularity				
Stability of self				
Interaction level x variability				
Variance explained (%)a	14.4	18.3	18.3	26.0
Interaction quality slope				
Intercept	S –	S –	S –	S +
Perc. social competence level	MS –			
Perc social comp variability	S –	S –		(S alone +)
Emotional distress			S –	
Popularity	S +			
Stability of self				
Interaction level x variability				S
Variance explained (%)ᵃ	16.5	8.9	4.5	8.7 (8.4) [b]
Importance				
Intercept	S +	S +	S +	
Perc. social competence level	NA	NA		
Perc social comp variability	NA	NA		
Interaction level x variability	NA	NA		S
Variance explained (%)ᵃ	NA	NA	0.0	9.4

Note. 'S' represents a significant predictor at $p < .05$. 'MS' represents a marginally

significant predictor at $p < .10$. '+' means the coefficient was positive; '–' means the

coefficient was negative. 'NA' means not applicable to that equation.

[a] Proportion of variance explained in the final model with only significant predictors.

[b] Proportion of variance explained by perceived social competence variability was entered

alone as a predictor.

Interaction quality. Regarding perceptions of interaction quality, the hypotheses were that (1) participants with high levels of perceived social competence would perceive their interaction more positively and of higher quality, and (2) participants who were more emotionally distressed would perceive their interactions in a more negative fashion than their less emotionally distressed peers.Results of the unconditional model with a randomly varying intercept indicated that the weighted average across participants and occasions of the perception of interaction quality was 5.54 (on a 7-point scales), and suggested that participants perceived their peer interaction in generally positive terms. The chi-square statistic indicated significant between-subject variance in the intercept coefficient (χ^2 (101) = 675.88, $p < .001$). The intraclass correlation (ρ) indicated that about a third (33.9 %) of the variance was between-persons and 66.1% was within-person. The reliability estimate of the random coefficient for the intercept was .83. The step-by-step analyses are presented in Appendix Q. The final model is presented below and results are shown in Table 16.

In the final model, perceived social competence level (t (97) = 2.57, $p < .05$) and emotional distress (t (97) = -2.96, $p < .05$) were the only significant predictors. However, the interaction term, significant in the "full model" (see Appendix Q) was no longer significant (t (97) = - 1.42, $p > .10$) and neither was perceived social competence variability (t (97) = 0.73, $p > .10$) when only significant predictors were entered. The final model with competence level and distress explained 19.3% of the between-person variance in the perception of interaction quality. Consistent with hypotheses, participants who perceived themselves as more socially competent were more likely to perceive their peer

Table 16

Results of the Final Model for the Intercept of Interaction Quality

Predictors	Coeff.	Stand. error	t-ratio	Df	p-value	Variance uncond model (τ_{ij})
Intercept						0.36
Intercept	5.55	0.06	94.86	97	< .001	
Perc. soc comp level	0.27	0.10	2.57	97	.010	
Perc. soc comp variab	0.18	0.25	0.73	97	.468	
Emotional distress	-0.74	0.25	-2.96	97	.004	
Popularity						
Stability of self						
Perc soc comp lev x var	-0.06	0.05	-1.42	97	.155	

Estimation of variance components after predictors in final model were entered

	Varian	St. dev	χ^2	Df	p-value	% explained
Intercept (τ_{oo})	0.29	0.54	557.57	97	< .001	19.3

Note. In this model, the assumption of heterogeneity of variance was violated (as indicated by a significant test of heterogeneity of variance not shown). The fixed effects estimates are presented with robust standard errors, which are less susceptible to violations of assumptions.

interactions as more positive, supportive, close and less rejecting. Also congruent with hypotheses, participants who experienced high levels of emotional distress (i.e., depression and anxiety) were more likely to perceive their peer interactions as less positive, less supportive and more negative than their non-distressed peers did.

Importance. Regarding perceptions of importance, the hypotheses were that individuals with variable self-feelings would be more likely to perceive events as being more important than would individuals with less variable self-feelings. Results of the unconditional model with a randomly varying intercept indicated that the weighted average across participants and occasions was 4.61, above the midpoint of the 7-point scale. Participants judged their peer interactions, on average, as moderately important events in their lives. The chi-square statistic indicated significant between-subject variance in the intercept coefficient (χ^2 (101) = 620.71, $p < .001$). The intraclass correlation (ρ) indicated that about 30.7 % of the variance in importance was between-persons. The reliability estimate of the random coefficient for the intercept was .81. The analyses focused on the between-persons variance in the intercept. The step-by-step analyses are presented in Appendix R. The final model is presented below and results are shown in Table 17.

When the final model with the significant predictors of perceived social competence level, variability and emotional distress was run, none of the predictors was uniquely statistically significant although variability was marginally significant. This pattern of results suggested that the unique effects found in the step-by-step model depended on the complex interplay of suppression of the shared variance among the

Table 17

Results of Final Model for the Intercept of Importance

Predictors	Coeff.	Standard error	t-ratio	Df	p-value	Variance uncond. model (τ_{ij})
Intercept						0.98
Intercept	4.61	0.10	44.25	95	< .001	
Perc. soc comp level	0.17	0.16	1.10	95	.271	
Perc. soc comp variab	0.90	0.48	1.87	95	.061	
Emotional distress	-0.71	0.46	-1.53	95	.126	
Popularity	0.03	0.11	0.27	95	.791	
Stability of self	0.14	0.16	0.83	95	.406	
Perc soc comp lev x var	-0.04	0.08	-0.50	95	.616	

Estimation of variance components after predictors in final model were entered

	Variance	St. dev	χ^2	Df	p-value	% explained
Intercept (τ_{00})	0.96	0.98	568.56	95	< .001	2.7

Note. In this model, the assumption of heterogeneity of variance was violated (as indicated by a significant test of heterogeneity of variance not shown). The fixed effects estimates are presented with robust standard errors, which are less susceptible to violations of assumptions.

variables. Once the shared variance of all the variables was taken into account, there was some tentative evidence that perceived social competence variability could claim some unique impact because it remained marginally significant. These findings offer some tentative support for the hypothesis that individuals with variable feelings of perceived social competence tend to perceive their peer interactions as more important than do individuals with less variable feelings of perceived social competence. However, these findings should be interpreted with caution because importance was measured by a one-item scale (although the reliability estimate in HLM indicated that a sufficient amount of reliable variance -.81- was available to be explained). In addition, the level 2 predictors, even in the most optimal combination, explained less than 4% of the between-person variance in the perceptions of importance.

Replication of Analyses

Emotion scales.

Previous investigations in the role of self-esteem variability have utilized one-time measures of 'typical' self-feelings or self-esteem (e.g., Kernis et al., 1993; Kernis & al., 1997) instead of the average of repeated measures used in this study. It was possible to do the same in the current study by replicating analyses using the group testing measure of perceived social acceptance instead of the average of the repeated measure of perceived social competence. It's important to reiterate that the domain-specific measure of perceived social competence was used and not a global measures of self-worth. One important reason for the replication is that the group testing measure of social acceptance did not share method variance or statistical variance with the measure of perceived social

competence variability, and thus, there would less of a suppressor effect within the equations. If the results replicated, it would lend support to the findings, especially those involving variability, and it would be harder to argue that significant results reflected chance or spurious findings. The general hypothesis was that the majority of results would replicate but that the group-testing measure of social acceptance would be a less powerful predictor of emotional responses due to its less immediate and current nature.

The analyses were conducted in the same step-by-step fashion as the first set and changes occurred only in two level 2 predictors: (1) average level of perceived social competence was replaced with group testing self-report measure of social acceptance and (2) the interaction term was created by multiplying the standardized scores of perceived social competence variability with the standardized scores of social acceptance. The level 1 model remained unchanged and the level 2 predictors were entered in the same order in the prediction of the intercept, the interaction quality slope and, if applicable, the importance slope. A summary of the analyses for each outcome scale is presented in Appendix S. Table 18 presents a summary of results for both the main analyses and the replication for ease of comparison. The results were virtually identical to the main set of results.

Across all the outcome variables, the pattern of findings was virtually identical to the main set of analyses and strengthens the conclusions that can be drawn from the study. There were some differences, however. One of the major ones suggested that compared to the average of perceived competence, the measure of social acceptance was not as powerful a predictor, alone or in interaction with variability, for positive affect.

Table 18

Summary of Results

Predictors	Main analyses				Replication			
	Sad	Anx	Ang	Pos Aff	Sad	Anx	Ang	Pos Aff
Intercept								
Intercept	S +	S +	S +	S +	S +	S +	S +	S +
Perc soc comp/accep	S +	S +	S +	S +	S +	S +	S +	
Per soc comp variab	S +	S +	S +		S +	S +	S +	
Emotional distress		MS +	S +	S –	MS +	S +	S +	S –
Popularity								
Stability of self								
Inter lev x variab								
Variance explained [a]	14.4	18.3	18.3	26.0	15.2	15.5	14.1	20.3
Interact quality slope								
Intercept	S -	S -	S -	S +	S -	S -	S -	S +
Perc soc comp/accep	MS -							
Per soc comp variab	S -	S -		(S +)	MS -	MS -		S +
Emotional distress			S -				S -	
Popularity	S +				MS +			
Stability of self								
Inter lev x variab				S				
Variance explained [a]	16.5	8.9	4.5	8.7 (8.4)[b]	15.1	7.0	4.0	10.5
Importance slope								
Intercept	S +	S +	S +		MS +	S +	S +	
Perc soc comp/accep	NA	NA			NA	NA		
Per soc comp variab	NA	NA			NA	NA		
Inter lev x variab	NA	NA		S	NA	NA		
Variance explained [a]	NA	NA	0	9.4	NA	NA	0	0

Note. 'S' represents a significant predictor at $p < .05$. 'MS' represents a marginally significant predictor at $p < .10$. '+' means the coefficient was positive; ' – ' means the coefficient was negative.

[a] Proportion of variance explained by the final model with significant predictors only.

[b] Amount explained by perceived social competence variability when entered alone as a predictor for the interaction quality slope.

Other minor differences concerned the level of significance of the effects. For example, a significant effect in one set of analyses became marginally non-significant or vice-versa. Thus, the main significant findings about the effects of variability and other variables cannot be explained solely as statistical artefacts or chance findings because the same pattern of results was found with the group-testing measure of typical perceived social acceptance.

Perception of the interaction.

For the outcome variable of interaction quality, the replication with social acceptance (presented in Appendix T) partially replicated the results. When social acceptance and emotional distress were entered in the final model, only emotional distress was a significant predictor. These findings suggested the effect of the group-testing social acceptance measure were not as consistent or uniquely predictive as were the effects of the average of perceived social competence repeated measures.

For the outcome variable of importance, the replication of the main set of analyses (presented in Appendix T) provided virtually identical results to those of the main set of analyses above: variability was a marginally significant predictor in the fully saturated model and no other predictor was significant.

Summary of Results

The findings of the current investigation largely support the hypotheses and are summarized in Table 15 and 18. Consistent with the main hypothesis, variability of perceived social competence significantly predicted the association (slope) between the interaction quality and the emotions of sadness, anxiety and positive affect. Emotional

distress was an independent predictor of this association only for the emotion of anger. Supporting the hypotheses, popularity did show a buffering effect and was a significant predictor of the association between the perception of the interaction quality and the emotions of sadness. There was also some evidence that level and variability of perceived social competence interacted to predict the association between perceptions of interaction quality and positive affect, and between perceptions of importance and positive affect.

Appraisals of the quality of the interaction, and to a much lesser extent, its importance, were significant predictors of how participants would react emotionally following a peer interaction. Significant random variation was found in both level of emotional reactions and in the association between the quality of the interaction and emotional reactions (slope). The association between appraisals of importance and emotional reactions, on the other hand, tended to be constant for sadness and anxiety but varied significantly between participants for anger and positive affect.

Congruent with hypotheses, individuals with high variability and individuals with high emotional distress showed higher levels of all the negative emotions following their peer interaction. Contrary to hypotheses, however, high perceived social competence level was also associated with higher level of negative emotions but consistent with hypotheses, higher levels of positive affect as well. These effects were independent of each other and remained significant once the variance explained by the other variables was taken into account. The interaction between level and variability was not a significant predictor of the level for any of the negative emotions.

Finally, consistent with predictions, there were individual differences in the

perception of the interaction quality and importance of peer interactions. Average level of perceived social competence was positively related to perceptions of interaction quality whereas emotional distress was negatively related to them. Interestingly, there were no significant differences in the perceptions of interaction quality as a function of variability. Regarding perceptions of importance, perceived social competence variability was positively related to higher ratings of importance.

Discussion

The results, taken in their entirety, provide consistent support for the main hypothesis that adolescents with variable self-feelings are more emotionally reactive to events, that is, their emotional reactions are stronger than those of individuals with less variable self-feeling, even when differences in their perception of the peer interaction are taken into account. It is important to note, however, that the current findings do not directly address the issue of causation.

Main Findings

Participants showing more variability in their self-feelings displayed a stronger association between the perceptions of their social interactions and their emotional reactions of anxiety and sadness than did individuals with less variable self-feelings. To return to the example in the introduction, an adolescent with highly variable perceived social competence would be more upset (i.e., for the emotions of sadness and anxiety) following a fight with his best friend than would a second adolescent with less variable competence who had a similar fight with his best friend. More specifically, the higher the

negative perception of the interaction, the more negative affect the first adolescent would experience. For the second adolescent, however, greater perception of the interaction's negativity would be less likely to be accompanied by feelings of sadness and anxiety.

It was also found that an adolescent with variable self-feelings may have higher positive emotional reactions following a positive peer interaction than would an adolescent with less variable self-feelings. This finding is particularly noteworthy given it is one of the few supporting increased positive reactivity. The significant interaction between level and variability of perceived social competence for positive affect also seems to suggest that the influence of variability may be stronger for adolescents with low perceived social competence – already vulnerable in their self-perceptions. However, this effect explained little variance and was smaller in magnitude than other effects.

Consistent with hypotheses and previous investigations on adolescents and adults (e.g., Rosenberg, 1986; Kernis et al., 1989; 1993; Waschull & Kernis, 1996), the findings suggest that higher variability predicts higher levels of sadness, anxiety and anger. However, it does not predict lower levels of positive affect. These findings remain the case even when taking into account emotional distress and level of perceived social competence. Emotional distress was also a significant, independent predictor of higher levels of negative emotions and lower levels of positive affect.

The results indicated that popularity acted as a buffer in the association between perception of the interaction and feelings of sadness, i.e., popular adolescents were less emotionally reactive than their less popular peers. The failure to reach statistical significance for the outcome measures of anxiety and anger may be due to popularity

being a significant but weak predictor and the absence of sufficient statistical power to detect effects. Another possible explanation is that after taking into account common variance, popularity may have shown little unique explanatory power. The lack of significant results for a buffering effect for positive affect is not surprising, given that the regulation of negative affect, especially its suppression, has been found to be generally considered by children as an adaptive, more desirable response within social situations, and that honest displays of positive affect have been found to be more acceptable (Underwood, 1997).

The current finding on emotional distress as a predictor of anger reactivity is consistent with previous findings that elevated levels of depression and anxiety, conceptualized as negative affectivity have been found to be associated with higher level of negative affect and lower levels of positive affect (Watson & Clark, 1984). Self-feeling variability, although clearly related to emotional distress, does not appear to be identical to it and is independently associated with emotional reactions.

Variability as Vulnerability, Popularity as Protection

Taken together, these findings strongly support Rosenberg's (1986) hypotheses that greater emotional reactivity in adolescents is related to unstable self-esteem and that these adolescents are more likely to react strongly to interpersonal events. The findings suggest that these stronger reactions are not explained by differences in participants' perceptions of the interaction, which actually did not vary as a function of variability. Individual differences in the perception of the interaction, even when they occurred, were taken into account by the statistics used.

Variability may be a tendency to react strongly to self-feeling- relevant information and thus to change one's self-view accordingly. This stance is consistent with that proposed by Butler and his colleagues (Butler, Hokanson, & Flynn, 1994) who suggested the term self-esteem lability to refer to the excessive reactivity of state self-esteem to daily negative and positive events. Lability in turn puts individuals at risk for depression when particularly stressful events occur or when individuals are already at risk by perceiving themselves as low in self-esteem or self-competence (Roberts & Gotlib, 1997; Roberts & Munroe, 1992; Tevendale et al., 1997). The notion of lability is very close to the idea that individuals with variable self-feelings tend to place more importance on other's feedback and approval, although lability implies a more general reactivity to all types of events, not just social ones.

The current findings that variability is associated with placing more importance on peer interactions is consistent with the notion that individuals with variable self-feelings place more importance on the feedback of others (Harter, 1999; Rosenberg, 1986) and are generally more ego-involved in everyday activities (Kernis & Waschull, 1995). Consistent with Rosenberg's ideas, Harter (1999) hypothesizes that adolescents who have not internalized a stable and secure sense of self by means of consistent and unconditional positive regard from their families of origin tend to engage more often in what she labelled 'looking-glass-self' orientation (borrowed from Cooley's 1902 terminology) that may make them more vulnerable to negative outcomes. Compared to adolescents endorsing an orientation focusing on their own self-esteem prior to approval by others, adolescents endorsing the 'looking-glass-self' orientation were found to be more preoccupied by peer

approval, to seek it out more strongly while at the same time finding more fluctuations in perceived approval levels. These adolescents were hypothesized to be better monitors of others' approval and thus, to be better able to either detect or experience its fluctuations. As Rosenberg (1986) predicted, the 'looking-glass-self' oriented adolescents (compared to peers choosing the other orientation) were found to be more reactive to naturally occurring changes in peer approval, and thus experienced more fluctuations in their levels of social self-esteem (Harter, 1999).

The present findings are certainly consistent with the idea of variability as a vulnerability factor. Adolescents with high perceived social competence variability, compared to their low variability peers, placed more importance on their peer interactions and were more emotionally reactive to them, as shown by increased levels of baseline negative emotions and by stronger associations between their perceptions and their emotional reactions. Although I did not directly test the impact on state self-esteem, the current findings certainly show increased reactivity (mostly with regards to negative emotions, but also positive emotions) on the part of adolescents with high self-feeling variability.

Although Harter points out the danger of overtly relying on external (peer) approval for a secure sense of self, the findings of the current study on popularity also offer some hope for those adolescents trying to 'construct' a self within the peer domain. It is possible that when peer approval is consistently positive, such as is the case of popular children and adolescents, instead of inconsistent or rejecting, it may produce a beneficial effect (see Sullivan, 1953).

The present findings additionally suggest that popularity acted as a buffer in the association between perceptions of the interaction and feelings of sadness and anger, independent of the role of perceived social competence variability. These results are consistent with previous findings showing that popular children have better emotion regulation skills than their less popular peers (Eisenberg & Fabes, 1992) and that popularity is related to more effective displays of emotions (e.g., McDowell et al., 2000). The buffering role for popularity also fits well with reflected appraisal theories (Cooley, 1902; Harter, 1999; Mead, 1934) of the development of self-esteem as a social construction in which others' opinions form the base for one's self-esteem. If an adolescent is popular, peers' positive regard and social behaviours may function to stabilize or solidify his or her social self-esteem. A more stable self-esteem in turn may reduce emotional reactivity to situations. The peer system may thus have an important stabilizing effect for children, some of whom may be at risk because of an unstable sense of self. Previous empirical research has suggested that positive relationships within the peer domain (i.e., friendships) may help to compensate for inadequacies of particular family environments and vice-versa. For example, the association between adolescents' friendships and perceived social competence is stronger for adolescents whose families are low in adaptability and cohesion than for adolescents whose families are high in these dimensions (Gauze, Bukowski, Aquan-Assee, Sippola, 1996).

Given that certain family environments characterized by controlling and noncontingent feedback are hypothesized to predispose children and adolescents to a more vulnerable, uncertain and unstable self-image (Kernis et al., 1993; Kernis & Waschull,

1995) one can speculate that a consistently favourable, positive peer environment (i.e., characterized by acceptance and liking, or by a close, mutual friendship) will compensate, buffer or repair the effects of potentially or actually damaging family environments. However, it is possible that if the peer group replicates the inconsistent, rejecting and/or neglecting influences of the family, the child or adolescent is at even more risk of suffering from instability of self and other emotionally distressing consequences. Sullivan (1953) spoke eloquently about the importance of developing a close intimate friendship with a peer ('chumship') for one's sense of well-being, validation and acceptability as person. He even suggested that the positive experiences in a close friendship may repair damage from a dysfunctional family experience. In other words, if the 'looking-glass-self' adolescent is looking at a 'good mirror', then his or her sense of self may actually benefit and be enhanced.

One of the mechanisms by which positive peer experiences may operate to diminish vulnerability is to help to stabilize the self, a hypothesis that was not directly tested in the present study. Future research may well examine this important question. The present results do suggest that popular adolescents have reduced negative emotional reactivity, itself a protective factor from emotional distress. Popularity showing a buffering effect for sadness seems particularly important given that sadness is often a precursor or concomitant of emotional distress and self-esteem variability has been associated with an increased risk for the development of depressive feelings (Roberts & Gotlib, 1997; Tevendale et al., 1997).

Although in the current study perceived social competence variability and

popularity were not significantly correlated, empirical research indicates that popularity

and level of self-esteem and perceived social competence are related. However, little is

known about the effects of popularity on the stability of the self-concept, about the (likely)

bi-directional association between the two, or the complex interaction with other factors,

such as level of self-esteem or emotional distress. The present study emphasizes once

more the notion that looking at level of self-esteem or domain-specific competence is only

capturing part of the richness and complexity of associations with other self-concept,

environmental and adaptive variables (DuBois & Tevendale, 1999). For example, in this

study, social competence level was not associated with increased reactivity in terms of the

association between perceptions and emotional reactions. The focus on level of self-

esteem must expand to include other characteristics, such as self-esteem variability and

clarity (Campbell et al., 1996), to capture more closely the complexity of self-esteem.

The consistency and solidity of the current results about perceived social

competence variability are particularly noteworthy given that hypotheses were submitted

to a stringent test. The effects of variability were examined concurrently with the effects

of emotional distress and level of perceived social competence and the study was

conducted on an all-boy sample. Empirical studies indicate that the self-concept of girls is

more volatile than that of boys (Rosenberg, 1979; Rosenberg & Simmons, 1972) and that

the effects of self-esteem variability are stronger in college women than men (Roberts &

Monroe, 1992). Apart from the obvious need for replication in a female sample, the

findings of the current study suggest that self-esteem variability is a phenomenon of

importance for males as well.

Level of Perceived Social competence and Acceptance

One of the most unexpected findings of the current study was that higher perceived social competence (or social acceptance) predicted higher levels of all the negative emotions. This finding was contrary to the hypotheses, unexpected and somewhat counterintuitive: adolescents who perceived themselves as more socially competent reported more sadness, anxiety and anger following their peer interaction than did adolescents who perceived themselves as less competent. Although these results are difficult to understand, one possible explanation may be that adolescents with higher perceived social competence felt more comfortable or more honest about admitting to negative feelings (as well as positive ones) following exchanges with their peers. They might have been better able to identify negative feelings, name them and report them in the questionnaire, along the lines of the construct of social or emotional intelligence (Mayer & Salovey, 1997).

It is also possible that a certain number of participants in the study (I believe not all) may have endorsed high perceived social competence ratings that do not reflect their situation. Their perceptions of their own social competence may have been quite inflated or unrealistically positive compared to their own actual capacities. For example, children and adolescents judged as aggressive by their peers using the class play have not been found to evaluate themselves negatively or to think poorly of their relationships with their peers (Bukowski & Newcomb, 1983; Hymel, Bowker, & Woody, 1993; Patterson, Kupersmidt & Griesler, 1990). In other words, it is possible that for some of these adolescents there may be a discrepancy between self-perception on the one hand and

actual social skills and social status on the other. Such aggressive children and adolescents often experience negative peer interactions because of their inappropriate behaviour and it is likely that they would have experienced negative emotions following them. Unfortunately, no class play data were collected on participants' perceptions of their peers to help us determine whether it might have been related to perceived social competence. Interestingly, self-perceived social competence was not highly correlated with peer-based measures of social competence (i.e., popularity in the form of liking and peer nominations). Although the correlation was significant, little variance was shared. The low association suggests that self-perceived social competence may not have reflected peer assessments of social competence. Although plausible, there is no possibility to test this hypothesis or to know what portion of participants may have shown this profile.

Emotional Distress

The current finding that emotional distress was a significant predictor of the association between interaction quality and the emotion of anger (i.e., anger reactivity) was noteworthy. The reason why this finding was particularly interesting is that emotional distress, a combination of scores on the sadness and anxiety scales, was not a significant predictor of this association for either the emotions of sadness or anxiety. Researchers have suggested that the experience of mixed emotions, such as a mix of sadness and anger, is fairly common in adolescence and that many of the events experienced by adolescents can elicit both emotions, for example, peer rejection can evoke feelings of sadness at the loss/rejection and also anger because one's goals have been thwarted (Harter & Buddin, 1987). Many of the negative peer events identified by the current sample include types of

situations in which the emotions elicited may have been blends of sadness, anger and anxiety. Empirical evidence also points to the correlation of emotional distress with other types of negative affect such as hostility (Watson & Clark, 1984). Thus, emotional distress as defined in this study might predispose participants to different types of negative affects, including anger reactivity.

However, emotional distress failed to be a significant predictor of emotional reactivity for sadness, anxiety and positive affect. It is possible that emotional distress is a significant but weak predictor and that its predictive power is overshadowed or subsumed by that of perceived social competence variability.

Differences between Emotions

In this study, the decision was made to analyse the emotions separately based on theoretical, methodological and statistical reasons, although some could argue that the emotions of anger, sadness and anxiety co-occur in everyday life and their levels are correlated (see Power, 1999). The present findings point to some interesting differences in the results of the emotions analysed. Although it is possible that these differences may not replicate in future research, it is also possible that they represent meaningful differences with interesting interpretations, some of which I will comment on. First, perceived social competence variability was a significant predictor of the association between interaction quality and the emotions of sadness, anxiety and positive affect, but not for anger. Emotional distress, on the contrary, was a significant predictor of this association only for the emotion of anger.

One could speculate that the effects of variability and distress are overlapping and

because HLM takes into account common variance, only the unique effects of one predictor may have attained significance. This is a definite possibility given that the measures are correlated in the current research, and that variability in self-feelings has been found in other studies to be related to emotional distress, especially depressive feelings (Tevendale et al., 1997; Roberts & Monroe, 1992). Another possibility is that anger differs from the other emotions in some specific way that makes it more likely for emotional distress to be a significant predictor. One way in which anger differed was in the relative amount of between-person variance.

One interesting ancillary finding is that the emotions examined differed in the relative proportion of within versus between-person variance (i.e., intra-class correlation). Such differences indicate how much of the variance is attributable to individual differences (or between person) characteristics versus situational factors within each person (e.g., differences in perceptions of daily events). Positive affect had the largest proportion of between-persons variance (39%), followed by sadness and anxiety (25%), and anger with the least (16%). Although it was not possible to determine statistically whether these proportions were significantly different from each other, the findings tentatively suggest that the degree to which a participant experiences positive affect after an event is due in greater proportion to his dispositional or personality characteristics. It is also consistent with empirical research that views positive affectivity as a reflection of extraversion and high levels of energy and enthusiasm (Watson & Tellegen, 1985).

Because anger had a relatively smaller proportion of between-person variance, less was available to be explained by the individual difference measures (i.e., the level 2

variables). One could speculate that this difference in (relative) variances may have contributed to the failure to find significance for variability. It is also possible that emotional distress, unlike competence variability, may exert its effect more powerfully in an emotional response that is more situationally determined. That is, as elements in the situation are likely to provoke anger, being emotionally distressed (anxious and/or sad) at the same time may exacerbate the association between perception and emotional reaction. Anxiety is often conceptualized in terms of increased sensitivity to, and perceptions of, threat (Mogg, Mathews, Bird & Macgregor-Morris, 1990; Richards & French, 1992). Anger is often provoked by perceived threats either to the self or to one's goals (Averill, 1982; Waschull & Kernis, 1996). It is possible that being more anxious (emotionally distressed – or trait anxiety) may have 'primed' participants when there might have been some situational cue suggesting a potentially angry response, so that distressed participants may have responded with greater levels of anger to their perceptions of negative interaction quality. However, my speculation does not explain why increased emotional distress did not predict increased reactivity for anxiety. Perceived social competence variability, although hypothesized to increase emotional reactivity for all emotions, may simply not play as much of a role in eliciting anger because of the increased importance of situational variables, or may be a less powerful predictor than emotional distress for this emotion.

Third, level and variability of perceived social competence interacted to predict reactivity for positive affect (with regard to the interaction quality and the importance associations). The effects were quite small and did not replicate in the second set of

analyses. Although the interaction results were consistent with what could be extrapolated from the hypotheses, the small effect size and failure to replicate raise the possibility that these effects may not be reliable and might be statistical artefacts. The fact that the interaction was significant for positive affect only is rather intriguing, especially since most of the research in the area has focused on, and found results for, negative affect. A possible explanation is that the relatively larger proportion of between-person variance for positive affect allowed more complex effects to reach statistical significance, aided by a more sophisticated statistical approach (HLM) than those used to date.

Finally, importance was a random predictor for anger and positive affect but not for sadness and anxiety. It should be noted that importance contributed very little variance to the model, and thus little was available to be explained by level 2 variables, rendering this variable somewhat superfluous in the model. The variable was included for theoretical reasons and indeed variability was associated with increased perceptions of importance for peer interactions. However, there was generally little variance in the association between importance and emotional reactions, and for the emotions of sadness and anxiety, the association was actually uniform across participants.

Measurement of Variability

An issue raised in studies measuring variability is whether it is a reliable measure and represents true fluctuations in self-feelings or whether it reflects unreliability (or randomness) in responding. This criticism has been levelled at studies using similar methodology (e.g., Greenier et al., 1995). The strongest evidence from the current study is that variability shows a significant and strong pattern of results and associations

consistent with hypotheses and previous empirical findings. It is here argued that the standard deviation is a valid index if sufficient, good quality data is collected. A methodological strength of the current study is that the repeated data on state self-feeling were collected randomly, and thus less likely to be biased by memory recall or time-of-day fluctuations. The various steps followed in the data collection and data selection for the current study have addressed these concerns more adequately than preceding investigations. Various methodological strategies were designed and implemented to ensure that only reliable data were used: pager signalling at random times, the restriction of valid data to that provided within 15 minutes of the signal, debriefing information, and a conservative criterion for number of usable data. Secondly, the motivation needed to complete the study and then provide enough information on peer interactions for analysis likely eliminated any participant that may have not been motivated to provided reliable data.

It is also important to note that the participants were very candid when writing and describing the activities they were engaged in at the time of the page, including smoking, taking drugs, fighting and sexual activity. It would illogical and inconsistent for them to provide such potentially detrimental information, while at the same time not completing the six short questions on self-feelings accurately and as reflecting their current state. Finally, much anecdotal information about the length to which participants went to take the pagers wherever they went and whatever they did (e.g., hockey games, church and camping) strongly suggested that the adolescents took the study very seriously.

Most important from a theoretical point of view is the question of the validity of

this methodology to measure fluctuations. Few researchers would disagree with the presence of short-term fluctuations in state measures of global self-esteem or domain-specific self-perceived competence or evaluation (academic, social, physical attractiveness). These changes have been well documented and are receiving increasing attention (DuBois et al., 2002; Harter, 2002; Kernis & Johnson, 1990; Markus & Kunda, 1986). The question is how to capture these changes in the most efficient and valid fashion.

If one wants to obtain a measure of changes or fluctuations, I believe that the standard deviation of repeated measures is a simple yet efficient index, first used by Kernis in the 1980s (e.g. Kernis et al., 1989). It has the advantage of easily summarizing variability in one index that is easy to understand, calculate and use in other analyses. In the current study, the variability measure has been found to show a significant and consistent pattern of meaningful associations. It certainly provides support for the choice of standard deviation to measure variability instead of a self-report measure like Rosenberg's Stability of Self scale. The latter was included in the analyses but it was not a significant predictor of any for the variables.

However, the inherent simplicity of the standard deviation measure masks some of the limitations in the measurement of variability. The standard deviation is an aggregate measure that confounds the frequency of changes with the intensity of those changes (Larsen, 1987). When the standard deviation is high, it is impossible to distinguish between extreme but infrequent changes, or frequent but small changes. In other words, frequency and intensity (extremity) of change represent two aspects of variability that are

related and sometimes confounded with each other (Larsen, 1987; Schimmack & Diener, 1997). Frequency of change is thus only partially represented by the standard deviation.

DuBois (personal communication, 2002) has suggested that the standard deviation of repeated measurements may mask systematic linear trends across repeated assessments. He proposes the use of dynamic state-trait models (Tisak & Tisak, 2000) that include a 'average' baseline in addition to the modelling of systematic growth over time (DuBois et al., 2002). This type of analysis would indeed be important to implement as it would remove bias associated with dynamic trait variance.

Larsen (1987) suggests spectral analysis (one approach of the general class of time-series analyses) as one way to measure variability. This approach decomposes the time series of repeated measurements into periodic functions of sine-cosine waves differing in periodicity, amplitude and phase and it allows the assessment of the frequency of changes independently of the amplitude of these changes (Gottman, 1981; Larsen, 1987). Spectral analysis has been applied successfully in an idiographic approach to the investigation of individual differences in the variability of daily mood (Larsen, 1987). Time series analysis has restrictive assumptions and requires a much larger number of observations that are equally spaced (Gottman, 1981). These requirements would not have been met by the current data set. However, this tool may be very useful in future investigations in the measurement of variability in self-feelings.

The Construct of Variability of Self-feelings

Questions about the measurement of variability clearly relate to questions about its nature and conceptualisation. In this study, variability has been conceptualized as

consisting of changes without the definition implying either potential causes and/or effects.

Much remains to be examined and understood about this construct that is so difficult to measure and describe. The present findings and past research suggest that self-esteem variability is a vulnerability factor in the development of depression and emotional distress in general. By increasing negative emotional reactivity, it puts people at risk for the chronic experience of negative emotions. Most importantly, variable self-esteem seems to imply fragility, instability, and lack of a solid foundation in the sense of self (Barnett & Gotlib, 1988; Harter, 1999; Kernis & Waschull, 1995; Rosenberg, 1986). In turn, this instability propels people to seek others' feedback and approval to help stabilize or bolster one's self-image.

During adolescence, the identity crises and emotional turmoil experienced by young people reflects much of this fragility, uncertainty and instability. Understanding the emotional dysregulation typical of adolescence thus requires knowledge not only of whether the adolescent feels good or bad about him or herself, but also how variable, stable and consistent is their self-view. The findings clearly indicate that certain adolescents, because of their particularly variable self-esteem, are more likely to be at risk for greater emotional reactivity and dysregulation. The emotional storm in which many adolescents may find themselves may also be more understandable not solely as a function of physical, hormonal and environmental changes, but also as a function of their increased reactivity because of their unstable and variable sense of self. The findings of the current study offers some hope that protective factors such as popularity and mutual friendship can stabilize or counteract the effects of an unstable sense of self, and thus, reduce

emotional turmoil.

Correlational studies suggest additional factors that overlap with the construct of self-esteem variability. Self-concept clarity (Campbell, 1990), defined as the extent to which the contents of the self-concept are clearly and confidently defined, temporally stable and internally consistent, is correlated with the Stability of Self Scale. Campbell and her colleagues developed a self-report scale, the Self-Concept Clarity scale (SCC) to measure self-concept clarity. The SCC includes most of the items from the Stability of Self Scale (Rosenberg, 1979), and thus subsumes the concept of stability within the more global construct of self-concept confusion. Compared to individuals with more certain, stable self-concepts, individuals with uncertain and temporally unstable self-concepts were found to be more sensitive and responsive to external self-relevant cues, and their emotional reactions to daily events showed greater variability because of an increased sensitivity to self-relevant feedback (Campbell and Lavallee, 1993). Many of these descriptions easily fit the portrait of the adolescent's unstable sense of self and resulting self-esteem (Rosenberg, 1986). Nevertheless, the constructs of variability and clarity seem, at least conceptually, distinct. Variability seems to refer more to a temporal characteristic whereas clarity may pertain more to the structure and organization of the content of the self-concept. If and when the two concepts are more clearly differentiated, it might be possible to examine their association and, perhaps, common origin.

The construct of variable self-esteem (or self-feeling) is discussed in the literature as a stable individual difference variable. It is possible that variability, like level of self-esteem, may show changes through time as the person has different experiences and

passes through developmental stages in which instability may be more normative (as in

adolescence). There is no study to my knowledge that has empirically examined the

question of whether variability is stable. Although the current study included two grades

(eight and nine), it is not sufficiently cross-sectional to shed light on the question of

whether self-esteem or self-feeling variability changes through time.

Clinical Implications

The clinical implications of this investigation further our knowledge in the area of

emotional reactivity and the results suggest one potential mechanism of action by which

variability of self-feelings leads to emotional distress, and more specifically, depression

(Kernis et al., 1998; Roberts & Gotlib, 1997; Tevendale et al., 1997). When faced with

stressful events or even neutral events of a social nature, adolescents with variable self-

feelings are likely to experience more negative affect and more frequently so than

individuals with less variable self-feelings. The increased higher levels of negative

emotions experienced following an event sets the stage for the chronic experience of

increased negative emotions (sadness, anxiety, irritability) and other associated behaviour

(e.g., social withdrawal) that in turn may develop, given enough stressful events, into

clinically significant symptoms of emotional distress such as depression and anxiety. The

significant findings of this study are particularly noteworthy given that the majority of

events described were positive to mildly negative in valence and thus the effects are not

just restricted to highly negative events.

Clinical interventions may utilize this information to help the person stabilize his

sense of self and self-concept, especially where this is related to strong reactivity to events

and to potentially catastrophic results (e.g., Linehan, 1993). Interestingly, many therapeutic orientations already have adopted the implicit (or explicit) therapeutic goal to strengthen the person's self-image and self-confidence through the process of psychotherapy. This goal is achieved most frequently by using warmth, empathy and unconditional positive regard toward the patient (Kohut, 1984; Rogers, 1961) and increasing his or her reliance on self-validation. Alternatively, cognitive-behavioural approaches emphasize structured exercises that aim to increase and solidify one's sense of self (Burns, 1980; Mruk, 1995; Young, 1994). Most approaches emphasize not only an increase in self-esteem, but also its stability and continuity. As discussed before, consistent positive regard experienced by the person as genuine (as in the case of popularity), can offer the person the opportunity to stabilize the self and reduce reactivity.

Another implication of the current findings is the potential benefit of (school or community based) programs aimed at increasing the social skills and peer popularity of at-risk adolescents. Social skills training programs have been shown to be fairly successful at promoting peer acceptance (Asher, Parker, & Walker, 1996). The current findings suggest that helping adolescents be more liked and accepted by their peers has additional positive consequences in terms of reduced emotional reactivity and negative affect.

Methodological and Statistical Contributions

Methodologically and statistically, this study makes a number of important contributions. First, by using Experience and Time Sampling Methodology, this study offered a creative way to collect information on repeated samples of naturally occurring social behaviour as it unfolded. Thus, it captured a slice of participants' life and opened a

window into the very private world of self-feelings, perceptions and reactions to everyday

social events that are often hard to appropriately capture by group testing methods.

Statistically, the analyses conducted allowed a more efficient and effective use of the data.

Individual differences were no longer treated as random error, but rather, variance was

more appropriately partitioned into within and between-persons variance and each level

was predicted by a number of variables.

Study Limitations and Future Directions

The current study does have a number of limitations that will need to be addressed

by future research. As mentioned previously, the all-male sample limits the generalizations

that can be drawn to only a portion of the adolescent population, in particular, a mostly

middle-class group of Anglo-Saxon or European origin. This is a serious limitation that

clearly needs to be addressed by replicating the findings in a female sample and in a cross-

section of socio-economic groups. In addition, the low consent rate for participation and

the attrition in the data (after screening) may have adversely affected the extent to which

the current results are representative of the original middle-class, male, mostly Anglo-

Saxon sample. In the same vein, it would be important to replicate the study with

different age groups to determine whether the findings change and whether self-esteem

level, variability, emotional distress and popularity become greater predictors of emotional

reactivity as children develop through the years.

From a statistical standpoint, the HLM models tested contained a large number of

predictors, especially at level 2, but also at level 1, where up to three random predictors

were tested. Although there was sufficient data to adequately test these models based on

the total number of participants and number of observations, it is very important to replicate the current findings with other samples. Given that to date, this study is the first one to examine the current questions using HLM, the models examined were comprehensive (all level 2 predictors tested for level 1 random coefficients) and somewhat cumbersome regarding the number of predictors used. Future studies may prefer simpler, more parsimonious models to test finer-grained hypotheses.

One important task that was beyond the scope of this study was the examination of perceived social competence variability as a function of participants' or situational characteristics. An important complement to the current study would be research focusing on the modeling of variability as a function of such variables, including familial and peer group influences. This type of research would greatly contribute to understanding the nature of variability.

The findings of the current study are also limited to feelings of perceived social competence in the area of peer relations. Perceived social competence is one domain, albeit a very important one, of self-evaluation contributing to global self-worth (Harter, 1999). It is important to replicate the results of this study to determine if the pattern of results regarding increased emotional reactivity are found using measures of global self-esteem or in another specific domain, such as for example, academic competence. At the methodological level, it will be important to measure the perceptions of the event (e.g., valence, importance, fit to one's goals) that are most relevant in that specific domain and to the reaction to it. An obvious measurement challenge will be to find questions that can appropriately and comprehensively measure the perceptions that apply to general

situations sampled randomly in time.

The current study does not directly address issues of causation but is an initial examination of the association between variability and emotional reactivity. Future research should focus on examining more closely some of the findings with a focus on clarifying issues of causation. However, experimentally manipulating participants' perceived self-esteem or domain-specific perceived competence involves important ethical concerns and methodological challenges. It might be possible to temporarily induce changes in self-esteem that may lead to changes in stability. For example, research with college students has used self-reflection tasks to elicit short-term changes to the clarity of self-esteem (Csank, 1995).

Despite these limitations, the current study remains one of the first to directly examine the association between variability of perceived social competence and emotional reactivity within the context of peer relations using advanced methodological and statistically tools.

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Appendix A:

Instructions for the Pager forms

Whenever the pager starts to beep, fill out one of the PAGER FORMS in the red side of the booklet. Fill out a different one every time as soon as possible after you are signalled. Complete the front and the back. The pager will ring 4 times a day, once in the morning before classes, once during lunch, and twice after school. Switch the pager off before going to bed, and then turn it on again when you wake up. All the pagers have the same number, so when yours starts to beep, so will everyone else's. If others' pagers go off but yours does not, fill out a form anyway. Also, check that it is turned on, and that the batteries are working properly. When the pager beeps, no matter where you are, fill out the form as soon as possible.

When you are somewhere and you do not want to be disturbed, like for example, when you go to a movie, switch the pager to vibration mode. If you are playing sports (for example, swimming, rugby, horse back riding) or doing another activity during which you cannot respond to the pager, turn it off and then turn it on again after you finish the activity.

There are no trick questions here, please be as honest as possible. All information will be kept confidential. I will not tell your friends, your teachers, your family, no one! This I guarantee you. I will call you at home during the week to make sure everything is ok. If you have any problems or comments, run out of forms, lose the pager, or decide you do not want to continue the study, please call me at 848-2849 or call me on my pager at 854-2176 and leave a number where I can call you. If your parents have any questions or concerns, you can also give them the numbers.

Thank you very much for participating!
If you have any questions or need help,
please call 848-2849 or 854-2176.

Appendix B:

Instructions for the Friend forms

After every interaction with your friends that lasts 10 minutes or more, fill out one of the FRIEND INTERACTION FORMS in the green side of the booklet. Fill out both the front and the back of the form. Any time when you spend time with your friends and/or classmates can be considered an interaction. Examples of an interaction are conversations with your best friend on the phone after school, going out for lunch with a group of friends, hanging out together after school, playing sports together or doing sports practice with your team. Many different things can be considered an interaction. The common characteristic is that you are spending time with your friends and/or classmates outside of class.

Try to do it as often as you can right after the interaction. At least, do it twice a day when you remember.

Usually, spending time with friends is fun. However, sometimes things can happen with your friends that can make you feel bad. For example, friens may talk behind your back or some people in your class may leave you out of things. Or you and your best friend could get into a fight, or he could give you the cold shoulder for a while. Or sometimes, other kids could pick on you and make your life hard at school. This type of think is very common with people your age and it may have happened to people you know. If may or may not have happened to you. These things are very important and I would like to know more about how they make people feel. If this kind of things happens to you during this week, please fill out a FRIEND FORM as soon as possible after it happens.

There are no trick questions here, please be as honest as possible. All information will be kept confidential. I will not tell your friends, your teachers, your family, no one! This I guarantee you. I will call you at home during the week to make sure everything is ok. If you have any problems or comments, run out of forms, lose the pager, or decide you do not want to continue the study, please call me at 848-2849 or call me on my pager at 854-2176 and leave a number where I can call you. If your parents have any questions or concerns, you can also give them the numbers.

Thank you very much for participating!
If you have any questions or need help,
please call 848-2849 or 854-2176.

Appendix C:

Pager Form

PAGER FORM
COMPLETE THIS FORM ONLY WHEN YOUR PAGER OR
OTHERS' PAGERS HAVE BEEN SIGNALLED

DID THE PAGER BEEP OR VIBRATE? (circle)   YES or NO
(Circle the day) MON TUE WED THU FRI SAT SUN   TIME _____ AM/PM

WHERE WERE YOU? (Please check) HOME ___ SCHOOL ___ TRAVELLING ___
PUBLIC PLACE (e.g., restaurant) ___ FRIEND'S HOUSE ___ OTHER ___

WHO WERE YOU WITH? (please check) ALONE ___ PARENT(S) ___
SISTERS/BROTHERS ___ BEST FRIEND ___ BOYFRIEND/GIRLFRIEND ___
FRIENDS: ___ MALE ___ FEMALE ___ CLASSMATES ___ STRANGERS ___
OTHERS ___ (SPECIFY _____)

WHAT WERE YOU DOING? _____
_____

WHAT WERE YOU THINKING/TALKING ABOUT? _____
_____

HOW WERE YOU FEELING JUST BEFORE FILLING OUT THE FORM:

CIRCLE ONE NUMBER FOR EACH EMOTION

	NOT AT ALL			SOME				A LOT
ANGRY	1	--	2	--	3	--	4	-- 5
CALM	1	--	2	--	3	--	4	-- 5
NERVOUS	1	--	2	--	3	--	4	-- 5
HAPPY	1	--	2	--	3	--	4	-- 5
FRUSTRATED	1	--	2	--	3	--	4	-- 5
DEPRESSED	1	--	2	--	3	--	4	-- 5
WORRIED	1	--	2	--	3	--	4	-- 5
PROUD	1	--	2	--	3	--	4	-- 5
IRRITATED	1	--	2	--	3	--	4	-- 5
ACCEPTED	1	--	2	--	3	--	4	-- 5
UPSET	1	--	2	--	3	--	4	-- 5
ENTHUSIASTIC	1	--	2	--	3	--	4	-- 5
SAD	1	--	2	--	3	--	4	-- 5
ASHAMED	1	--	2	--	3	--	4	-- 5
AFRAID	1	--	2	--	3	--	4	-- 5
FRIENDLY	1	--	2	--	3	--	4	-- 5
LIKE HITTING SOMEONE/SOMETHING	1	--	2	--	3	--	4	-- 5

RIGHT NOW ....   CIRCLE A NUMBER

	REALLY DISAGREE								REALLY AGREE
I FEEL LIKE A AM A GOOD PERSON	1	--	2	--	3	--	4	--	5
I FEEL WELL LIKED	1	--	2	--	3	--	4	--	5
I FEEL I'M GOOD AT SPORTS	1	--	2	--	3	--	4	--	5
I FEEL POPULAR	1	--	2	--	3	--	4	--	5
I LIKE MYSELF	1	--	2	--	3	--	4	--	5
I FEEL HAPPY WITH THE WAY I LOOK	1	--	2	--	3	--	4	--	5
I FEEL LIKE I HAVE MANY FRIENDS	1	--	2	--	3	--	4	--	5
I FEEL HAPPY WITH THE WAY I AM	1	--	2	--	3	--	4	--	5

THINK ABOUT WHAT YOU WERE DOING WHEN THE PAGER BEEPED:

HOW IMPORTANT WAS WHAT YOU WERE DOING? (Circle a number)
NOT AT ALL IMPORTANT 1 -- 2 -- 3 -- 4 -- 5 VERY IMPORTANT

HOW DID YOU FEEL ABOUT IT? (Circle a number)
VERY NEGATIVE 1 -- 2 -- 3 -- 4 -- 5 VERY POSITIVE

++++++++++++++++++++++

ADDITIONAL COMMENTS. CARTOONS, EXCUSES: ...

Appendix D:

Friend Form

FRIEND FORM
COMPLETE THIS FORM ONLY AFTER AN INTERACTION
WITH YOUR FRIEND(S) OR CLASSMATE(S)

(Circle the day) MON TUE WED THU FRI SAT SUN   TIME _____ AM/PM

WHERE WERE YOU? (Please check) HOME ___ SCHOOL ___ TRAVELLING ___
PUBLIC PLACE (e.g., restaurant) ___ FRIEND'S HOUSE ___ OTHER ___

WHO WERE YOU WITH? (please check) ALONE ___ PARENT(S) ___
SISTERS/BROTHERS ___ BEST FRIEND ___ BOYFRIEND/GIRLFRIEND ___
FRIENDS: ___ MALE ___ FEMALE ___ CLASSMATES ___ STRANGERS ___
OTHERS ___ (SPECIFY _____)

DESCRIBE THE EVENT WITH YOUR FRIEND(S) AND/OR CLASSMATES(S)
WITH AS MUCH DETAIL AS YOU CAN: _____
_____
_____
_____
_____

WHAT WERE YOU THINKING/TALKING ABOUT? _____
_____

LENGTH OF INTERACTION WITH YOUR FRIEND(S): ___ HRS ___ MIN

HOW WAS THE INTERACTION WITH YOUR FRIEND(S)/CLASSMATE(S)?

CIRCLE A NUMBER FOR YOUR ANSWER

1. NOT AT ALL IMPORTANT   1 - 2 - 3 - 4 - 5 - 6 - 7 VERY IMPORTANT
2. VERY NEGATIVE   1 - 2 - 3 - 4 - 5 - 6 - 7 VERY POSITIVE
3. DISAGREEMENT: LOW 1 - 2 - 3 - 4 - 5 - 6 - 7 HIGH
4. SUPPORT: LOW 1 - 2 - 3 - 4 - 5 - 6 - 7 HIGH
5. I FELT: ACCEPTED 1 - 2 - 3 - 4 - 5 - 6 - 7 REJECTED
6. HOW DID YOU FEEL TOWARDS THE OTHER PERSON(S)?
        NOT AT ALL CLOSE   1 - 2 - 3 - 4 - 5 - 6 - 7 VERY CLOSE
7. DID YOU FEEL LIKE YOU BELONGED TO A GROUP?
            NOT AT ALL 1 - 2 - 3 - 4 - 5 - 6 - 7 VERY MUCH
8. DID YOU TALK ABOUT PERSONAL THINGS?
            NOT AT ALL 1 - 2 - 3 - 4 - 5 - 6 - 7 VERY MUCH

HOW ARE YOU FEELING RIGHT NOW:

CIRCLE <u>ONE</u> NUMBER FOR EACH EMOTION

	NOT AT ALL			SOME				A LOT
ANGRY	1	--	2	--	3	--	4	--	5
CALM	1	--	2	--	3	--	4	--	5
NERVOUS	1	--	2	--	3	--	4	--	5
HAPPY	1	--	2	--	3	--	4	--	5
FRUSTRATED	1	--	2	--	3	--	4	--	5
DEPRESSED	1	--	2	--	3	--	4	--	5
WORRIED	1	--	2	--	3	--	4	--	5
PROUD	1	--	2	--	3	--	4	--	5
IRRITATED	1	--	2	--	3	--	4	--	5
ACCEPTED	1	--	2	--	3	--	4	--	5
UPSET	1	--	2	--	3	--	4	--	5
ENTHUSIASTIC	1	--	2	--	3	--	4	--	5
SAD	1	--	2	--	3	--	4	--	5
ASHAMED	1	--	2	--	3	--	4	--	5
AFRAID	1	--	2	--	3	--	4	--	5
FRIENDLY	1	--	2	--	3	--	4	--	5
LIKE HITTING SOMEONE/SOMETHING	1	--	2	--	3	--	4	--	5

<u>RIGHT NOW</u>....   CIRCLE A <u>NUMBER</u>

	REALLY DISAGREE							REALLY AGREE
I FEEL LIKE A AM A GOOD PERSON	1	--	2	--	3	--	4	--	5
I FEEL WELL LIKED	1	--	2	--	3	--	4	--	5
I FEEL I'M GOOD AT SPORTS	1	--	2	--	3	--	4	--	5
I FEEL POPULAR	1	--	2	--	3	--	4	--	5
I LIKE MYSELF	1	--	2	--	3	--	4	--	5
I FEEL HAPPY WITH THE WAY I LOOK	1	--	2	--	3	--	4	--	5
I FEEL LIKE I HAVE MANY FRIENDS	1	--	2	--	3	--	4	--	5
I FEEL HAPPY WITH THE WAY I AM	1	--	2	--	3	--	4	--	5

++++++++++++++++++++

ADDITIONAL COMMENTS, CARTOONS, EXCUSES: ...

Appendix E:

Positive Sociometric Nominations

WHO ARE YOUR FRIENDS?

READ CAREFULLY: We would like to know who your friends are and with whom you spend time at school. In the space below, put the name of the persons who are your best friends. Put your very best friend on line one, your second best friend on line two, the third best on line three and son on. The names you choose must be from the people in your grade who are participating in the study. Below is the list in alphabetical order by section. You can list as many or as few people as you want, or none at all. All your answers will remain confidential.

FIRST NAME   **LAST NAME**

1. _____ (first best friend)

2. _____ (second best friend)

3. _____ (third best friend)

4. _____ (fourth best friend)

5. _____ (fifth best friend)

6. _____ (etc. ...)

7. _____

8. _____

9. _____

10. _____

5. _____

6. _____

Section 2A   Section 2B   Section 2C   Section 2D

(list of names of students)

Appendix F:

Liking Ratings

READ CAREFULLY: Now we would like to know how much you like each person in your class. Indicate how much you like each person by checking off one of the boxes that follows the person's name. There are five different levels of liking. Please rate yourself too. Remember that your answers will remain confidential. Do not discuss your answers with anyone.

"A PERSON THAT I LIKE"

	NOT AT ALL	A LITTLE	SOMETIMES	USUALLY	VERY MUCH
First, last name	□	□	□	□	□
First, last name	□	□	□	□	□
First, last name	□	□	□	□	□
First, last name	□	□	□	□	□
First, last name	□	□	□	□	□
First, last name	□	□	□	□	□
First, last name	□	□	□	□	□
First, last name	□	□	□	□	□
Etc.					

Appendix G:

Self-Perception Profile for Adolescents

-

ABOUT ME

We would like to ask you some questions about yourself. It is not a test. There are no right or wrong answers, and everyone will have different answers. Be sure that your answers show how you feel about yourself. Please do not talk about your answers with anyone else. We will keep your answers private and not show them to anyone. After each sentence there are five boxes. Each one tells us about whether or not someone thinks the statement is true for them. Read each sentence and ask yourself "Is this sentence true about me?" then put a mark (an X or an √) in the box according to how true the sentence is for you.

FALSE means it is <u>definitely not true</u> for you

MOSTLY FALSE means it is <u>probably not true</u> for you

MAYBE means it <u>might or might not be true</u> for you

MOSTLY TRUE means it is <u>probably true</u> for you

TRUE means that it is <u>definitely true</u> for you

		False	Mostly False	Maybe	Mostly True	True
1.	I feel that I am just as smart as others my age.	□	□	□	□	□
2.	I find it hard to make friends.	□	□	□	□	□
3.	I do very well at all kinds of sports.	□	□	□	□	□
4.	I am *not* happy with the way I look.	□	□	□	□	□
5.	If I am romantically interested in someone, I feel that the person will like me back.	□	□	□	□	□
6.	I usually do the right thing.	□	□	□	□	□
7.	I am able to make really close friends.	□	□	□	□	□
8.	I am often disappointed in myself.	□	□	□	□	□
9.	I am pretty slow in finishing my schoolwork.	□	□	□	□	□
10.	I have many friends.	□	□	□	□	□
11.	I think I could do well at just about any new athletic activity.	□	□	□	□	□
12.	I wish my body was different.	□	□	□	□	□
13.	I am *not* dating the people that I am really attracted to.	□	□	□	□	□
14.	I often get in trouble for the things I do.	□	□	□	□	□

15. I have a close friend that I can share secrets with. □ □ □ □ □

16. I don't like the way I am leading my life. □ □ □ □ □

17. I do very well at my classwork. □ □ □ □ □

18. I am very hard to like. □ □ □ □ □

19. I feel that I am better than others at sports. □ □ □ □ □

20. I wish my physical appearance was different. □ □ □ □ □

21. I feel that people my age will be romantically

attracted to me. □ □ □ □ □

22. I feel really good about the way I act. □ □ □ □ □

23. I wish I had a really close friend to share things with. □ □ □ □ □

24. I am happy with myself most of the time. □ □ □ □ □

25. I have trouble figuring out the answers in school. □ □ □ □ □

26. I am popular with others my age. □ □ □ □ □

27. I don't do well at new outdoor games. □ □ □ □ □

28. I think I am good looking. □ □ □ □ □

29. I feel that I am fun and interesting on a date. □ □ □ □ □

30. I do things that I know I shouldn't do. □ □ □ □ □

31. I find it hard to make friends that I can really trust. □ □ □ □ □

32. I like the kind of person I am . □ □ □ □ □

33. I feel that I am pretty intelligent. □ □ □ □ □

34. I feel that I am socially accepted. □ □ □ □ □

35. I do not feel that I am very athletic. □ □ □ □ □

36. I really like my looks. □ □ □ □ □

37. I *don't* usually go out with the people

that I would really like to date. □ □ □ □ □

38. I usually act the way I know I am supposed to. □ □ □ □ □

39. I *don't* have a friend that is close enough

to share really personal thoughts with. □ □ □ □ □

40. I am very happy being the way I am. □ □ □ □ □

Appendix H:

Children's Depression Inventory

Teenagers sometimes have different feelings and ideas. This form lists feelings and ideas in groups. From each group, pick one sentence that describes you best for the past two weeks. After you pick a sentence from the first group, go on to the next item. There are no right or wrong answers. Just pick the sentence that best describes the way you have been recently and put a mark next to your answer.

Here is an example of how this form works. Try it, put a mark next to the sentence that describes you best. Example   __   I read books all the time.
                                               __   I read books once in a while.
                                               __   I never read books.

PICK OUT THE SENTENCE THAT DESCRIBES YOUR FEELINGS AND IDEAS IN THE PAST TWO WEEKS AND PUT A MARK NEXT TO IT.

1. __ I am sad once in a while.
    __ I am sad many times.
    __ I am sad all the time.

2. __ Nothing will ever work out for me.
    __ I am not sure if things will work out for me.
    __ Things will work out for me OK.

3. __ I do most things OK.
    __ I do many things wrong.
    __ I do everything wrong.

4. __ I have fun in many things.
    __ I have fun in some things.
    __ Nothing is fun at all.

5. __ I think about bad things happening to me once in a while.
    __ I worry that bad things will happen to me.
    __ I am sure that terrible things will happen to me.

6. __ All bad things are my fault.
    __ Many bad things are my fault.
    __ Bad things are not usually my fault.

7. __ I feel like crying every day.
    __ I feel like crying many days.
    __ I feel like crying once in a while.

8. __ Things bother me all the time.
    __ Things bother me many times.
    __ Things bother me once in a while.

9. __ I like being with people.
    __ I do not like being with people many many times.
    __ I do not want to be with people at all.

10. __ I cannot make up my mind about things
    __ It is hard to make up my mind about things.
    __ I make up my mind about things easily.

11. __ I look OK.
    __ There are some bad things about my looks.
    __ I look unattractive.

12. __ I have to push myself all the time to do my school work.
    __ I have to push myself many times to do my school work
    __ Doing schoolwork is not a big problem.

13.__ I have trouble sleeping every night.
__ I have trouble sleeping many nights.
__ I sleep pretty well.

14.__ I am tired once in a while.
__ I am tired many days.
__ I am tired all the time.

15.__ Most days I do not feel like eating.
__ Many days I do not feel like eating.
__ I eat pretty well.

16.__ I do not worry about aches and pains.
__ I worry about aches and pains many times.
__ I worry about aches and pains all the time.

17.__ I do not feel alone.
__ I feel alone many times.
__ I feel alone all the time.

18.__ I never have fun at school.
__ I have fun at school once in a while.
__ I have fun at school many times.

19.__ I have plenty of friends.
__ I have some friends but I wish I had more.
__ I do not have any friends.

20.__ My school work is alright.
__ My school work is not as good as before.
__ I do very badly in subjects I used to be good in.

21.__ I can never be as good as other teenagers.
__ I can be as good as other teenagers if I want to.
__ I am just as good as other teenagers.

22.__ Nobody really loves me.
__ I am not sure if anybody loves me.
__ I am sure that somebody loves me.

23.__ I usually do what I am told.
__ I do not do what I am told most times.
__ I never do what I am told.

24.__ I get along with people.
__ I get into fights many times.
__ I get into fights all the time.

Appendix I:

Trait Anxiety Inventory for Children

"HOW-I-FEEL" QUESTIONNAIRE

DIRECTIONS: A number of statements that people use to describe themselves are given below. Read each statement carefully and decide if it is *hardly ever*, or *sometimes*, or *often* true of you. Then for each statement, put a mark (it could be an X or a √) in the box in front of the word that seems to describe you best. There are no right or wrong answers. Do not spend too much time on any one statement. Remember, choose the word that seems to *describe best how you usually feel*.

1. I worry about making mistakes   □ hardly ever   □ sometimes   □ often

2. I feel like crying   □ hardly ever   □ sometimes   □ often

3. I feel unhappy   □ hardly ever   □ sometimes   □ often

4. It is difficult for me to face my problems   □ hardly ever   □ sometimes   □ often

5. I worry too much   □ hardly ever   □ sometimes   □ often

6. I get upset at home   □ hardly ever   □ sometimes   □ often

7. I feel troubled   □ hardly ever   □ sometimes   □ often

8. Unimportant thoughts run through my mind and bother me   □ hardly ever   □ sometimes   □ often

9. I worry about school   □ hardly ever   □ sometimes   □ often

10. I have trouble deciding what to do   □ hardly ever   □ sometimes   □ often

11. I notice my heart beats fast   □ hardly ever   □ sometimes   □ often

12. I am secretly afraid   □ hardly ever   □ sometimes   □ often

13. I worry about my parents   □ hardly ever   □ sometimes   □ often

14. I worry about things that may happen   □ hardly ever   □ sometimes   □ often

15. I get a funny feeling in my stomach   □ hardly ever   □ sometimes   □ often

16. I worry about what others think of me   □ hardly ever   □ sometimes   □ often

Appendix J:

Stability of Self Scale

DIRECTIONS: The following statements refer to how you may feel about yourself.
Please indicate how much YOU agree with each statement. Circle a number from 1 to 5
using the following scale. Please be as honest as possible.

1 = STRONGLY DISAGREE   3 = NEUTRAL   4 = AGREE
2 = DISAGREE   5 = STRONGLY AGREE

Circle a number
Strongly   Strongly
Disagree   Agree

1. On one day I might have one opinion of myself and
   on another day I might have a different opinion.   1 -- 2 -- 3 -- 4 -- 5

2. My opinion of myself tends to change a good deal
   instead of always remaining the same.   1 -- 2 -- 3 -- 4 -- 5

3. I change from a very good opinion of myself to a
   very poor opinion of myself.   1 -- 2 -- 3 -- 4 -- 5

4. I have noticed that my ideas about myself seem
   to change very quickly.   1 -- 2 -- 3 -- 4 -- 5

5. I feel that nothing, or almost nothing, can change
   the opinion I currently hold of myself.   1 -- 2 -- 3 -- 4 -- 5

Appendix K:

Debriefing Measure

HOW DID YOU FIND THE EXPERIENCE?

1. Would you participate in this study again?   □ Yes   □ No   □ Maybe

2. We know that sometimes people do not take this study seriously and/or are too busy to fill out the form truthfully. However, it is really important that all the data that we collect is <u>as accurate as possible</u>, otherwise we will not find any results. If you didn't take the questions seriously, that's ok, just tell us. Now is your chance to tell us how you filled out the forms. There will be no consequences and the information you give us will be kept confidential, and of course, you will keep the money for your participation.

When I filled out the form I was ...

□ Truthful most or   □ Truthful only   □ Most of the time I did not
all the time   part (half) of the time   take the questions seriously
                                                and/or I was not truthful

Thank you for being truthful in answering.

3. Did yo learn anything from your experience?   □ Yes   □ No

If yes, what? _____

4. How did you find the procedure of using the pager and filling out the forms?

□ Difficult   □ Ok   □ Easy

5. Did you have any problems with:

The pager?   □ Yes   □ No
If yes, please describe: _____

The times at which you were beeped?   □ Yes   □ No
If yes, please describe: _____

Completing the forms? □ Yes   □ No
If yes, please describe: _____

Anything else? _____

6. Any comments? _____

Appendix L:

Coding System

DIARY ENTRY CODING

COMPANIONSHIP

The purpose of this category is to code the most important companion that the participant is with. For example, if the participant is watching TV with his parents and friends, he is likely most influenced by the presence of his friends than by the presence of his parents, thus, the most important companion (in terms of likely influence on activity/feelings) would be the friends. Likewise, if he is with friends and his girlfriend at a party, and says his main activity is 'making out, then one would code 'girlfriend' as the companion for this activity. Thus, before coding companion and activity, take the time to read all the comments, including what is said on the back of the page (if anything) to get a better picture of what the participant is doing at the time.

Sometimes, the companion is not indicated properly, e.g., participant will check off 'alone' and 'friend' when talking on the phone with a friend. Alone should not have been checked off, thus cross it out and initial the changes. As the information provided makes it clear who the companion are, feel free to make changes to the data. The majority of the time, these changes will involve crossing out 'alone' because the person is with someone or adding new people (which the participant will have mentioned in the activity or thinking/talking question). If in doubt, consult.

1. ALONE:
When participants were alone only.

2. FAMILY:
Time spent with any combination of family members (parents, siblings, extended family, cousins, etc.)

3. FRIENDS:
Time spent with same and other-sex friends and also friends and family (because friends set tone for activities); time spent talking on the phone with a friend. If there are other people, (family, strangers, girlfriend) code 'friends' depending on the activity (as described in the first paragraph above). 'Friends' is usually chosen because participants tend to be engaged in activities with them (e.g., watching TV). However, see example above involving girlfriend.

4. BEST FRIEND:
Includes time spent with best friend only (i.e., no other person present). If best friend and friends are both indicates, and it is clear from the context that he is with only one other person (e.g., 'on the phone with John') code 'best friend'. If participant is with several people or the number is uncertain, code 'friends'.

5. CLASSMATES:
Indicate if only classmates or teammates are checked off.

6. ROMANTIC PARTNER:
Includes time spent only with girlfriend/boyfriend.

7. OTHERS:
Includes time spent with individuals other than those specified above, such as bosses, teachers, coaches, or when participants did not specify or when meaning is not clear from other information.

9. MISSING:
Only when the companion(s) was not indicated and it is not possible to infer it from the other information. For e.g., in the activity question, person says he was talking to his friend, so you can infer that the companion was a friend (3). You should then change it on the form. This was already done in some, but not all, forms.

DIARY ENTRY CODING

ACTIVITY

These categories are influenced by the coding system used by Larson & Richards (1989) and Larson (1991). Code the information provided in the activity question but also look at the information provided in the thinking/talking question and/or comments at the back of the form to get a better idea of what the person is doing when he was paged and/or interacting with friends. The goal is so capture what they are doing without inferring too much into their activities. Sometimes, the activity coded will influence who is coded as the companion. Please make sure that you check the code for 'companion' after 'activity' is coded.

Sometimes, participants will indicate two activities: e.g., talking during lunch at school, which would be coded SOCIALIZING and MAINTENANCE (eating). When two activities are clearly indicated, code according to this hierarchy (in order of theoretical importance for my hypotheses). If two activities at the same level are mentioned (e.g., playing hockey and listening to music, SPORTS and LEISURE), choose the code for the activity mentioned first (in the e.g., it would be playing hockey, therefore, SPORTS).

SOCIALIZING > SPORTS, LEISURE, SCHOOLWORK (ALL AT THE SAME
LEVEL) > MAINTENANCE > TRAVEL > OTHER

1. SCHOOLWORK:

Any activity having to do with classes and homework. It includes class time, doing homework, discussing work with friends, doing projects on computer, asking questions in class, getting books before class.

2. LEISURE/HOBBIES:

Pleasant activities in which the person engages willingly. This category emphasizes the activity (content) as the focus of the person's attention, rather than the process of being with someone (as is more the case with SOCIALIZING). Examples include watching TV, watching movies, playing games, listening to or playing music, reading (sometimes hard to distinguish from reading for school – if in doubt, code LEISURE), dancing, art & hobbies, trips for fun (e.g., going to amusement parks such as La Ronde), camping and related activities, roller blading, skateboarding, watching sports on TV or attending games, surfing the net, shopping with family and friends, going to the cottage with family and/or friends, etc.

3. SOCIALIZING:

This category focuses on the process of interacting with someone else, communicating, building (or damaging) a relationship. It includes time spent talking and/or communicating with friends, romantic partner or family (in person or on the phone) or hanging out. It

includes activities such as talking, discussing, 'having a butt' (smoking), 'running around school', getting/reading e-mail, being at a party, 'smoking up', having disagreements with someone, ' 'hanging out', walking (with the indication that there is some talking) and making out/kissing/'whatever' with girlfriend/boyfriend. It includes negative interactions such as fighting, arguing, being lectured by, etc. with friends and/or family. I have also included the Walk-a-Thon (e.g., 'doing the Walk-a-Thon) and getting ready for it when friends are present, because we know most participants went with friends and/or classmates and there was a great deal of socializing occurring. The Walk-a-Thon is a special charity event put on by the school on a Saturday during one of the data collection weeks.

4. SPORTS:

Time spent in sports activities (practise and preparation), both organized and on, in and out of school, whether the person is alone or not. The definition of sports include any activity which is normally classified as such, e.g., hockey, baseball, basketball, rugby, golf, even softball. It includes getting ready for practise, waiting just before the game, going to the gym, and getting ready for gym. It includes games played with one other friend and/or sibling at home (e.g., played basketball with my sister). If travelling to a sport and not doing any other activity, code TRAVELLING.

5. MAINTENANCE:

Time spent doing essential every day tasks of self-care, health maintenance and chores, for either oneself or the family. It includes activities such as sleeping, napping, resting, lying down (if sick), eating, grooming, going to the bathroom, doing chores, cooking, cleaning, going to the doctor, the dentist, the hairdresser, gardening (with parents), fixing things (bike, equipment, computer) unless fixing is part of regular maintenance (e.g., tuning guitar, code LEISURE), packing books in the morning (if class or specific work specified, e.g., taking out my French homework, put SCHOOLWORK), getting ready for things (to do out, go to school, getting dressed), babysitting (unless it's suggested that they are being paid, then put WORK), buying clothes and shoes (buying fun stuff, put LEISURE).

6. TRAVELLING:

Time spent travelling only without mention of other activities, such as talking, socializing, or engaging in leisure activities (e.g., listening to music on the train will be coded as LEISURE). It includes getting rides, walking home, sitting on the train, waiting for bus/train and obviously not socializing, phrases like 'just came in', 'going out', 'walked in the door' (which imply that the person has just terminated/started travelling).

7. WORK/COMMUNITY RELATED ACTIVITIES:

This is a 'combined' category in which we include (1) paying jobs, (2) chores for the community (e.g., volunteer work) and (3) church related activities, such as going to church, teaching Sunday school, etc.

8. OTHER:

It includes activities not classifiable in the above categories or activities which, although distinct, occur at such low frequency that a distinct category is not viable. Examples have included taking a driving course (only 1 participant so far), lying in bed, wondering what to do, 'nothing', going to the depanneur, shopping with parents for a microwave (if shopping for clothes, put MAINTENANCE, if shopping for fun stuff, e.g., CDs, put LEISURE), counting money for Walk-a-Thon. If you feel that the activity does not really fit into the previous categories, do not hesitate to put it in OTHER.

9. MISSING:

Only when the activity was not indicated: line must be blank. Rarely used because participants indicate some activity or thought/talking questions which, if ambiguous, can be coded under 'other'.

When students are waiting for a class, look at thought/talking question to determine what they are doing more precisely. If the topic of conversation suggests leisure or socializing (e.g., making fun of one kid, or talking about sports or games while waiting for class to start), code SOCIALIZING (as appropriate). If is suggests work-related discussion or thoughts (e.g., worried about a test), put SCHOOLWORK.

When at lunch, look at thinking/talking questions to determine what is most salient for the person at that time. If kid is thinking about eating, food, caf line, or if nothing else is added, put MAINTENANCE. If the person indicates that they are talking, discussing, etc. put SOCIALIZING. Some cases may be really ambiguous, and if both are likely present, put SOCIALIZING because it has precedence over MAINTENANCE when both are present.

Appendix M:

Step-by-step HLM Analyses for Sadness

Level 2 model: Prediction of the intercept. In the first step, perceived social competence variability was entered in the prediction of the intercept. Results showed that perceived social competence variability was a significant predictor (t (100) = 3.42, $p <$ .01). Consistent with the hypothesis, more variability in perceived social competence predicted higher reports of sadness following peer interactions. This model accounted for 12.6% of the between-person variance in the level of sadness.

In the second step, level of perceived social competence was added to the equation. Perceived social competence variability continued to remain a significant predictor of level of sadness (t (99) = 3.49, $p <$ .01). Examination of the fixed effects showed that perceived social competence level was marginally significant (t (98) = 1.82, $p <$ .10). As participants perceived themselves more socially competent, they reported more sadness. This model accounted for approximately 14.3 % of the between-persons variance in the level of sadness, a small improvement from the model with perceived social competence variability alone.

In the third step for the prediction of the intercept, emotional distress, popularity and stability of self were added to the equation. None of the new predictors was statistically significant (emotional distress: t (96) = 1.50, $p >$ .10; popularity: t (96) = 0.63, $p >$ .10; stability: t (96) = -0.04, $p >$.10). Like in the previous models, perceived social competence variability continued to be a significant predictor and level of perceived social competence continued to be marginally significant. The new predictors as a block explained little incremental variance in the model. On the contrary, the proportion of variance in the intercept explained by this model actually decreased to 13%.

Level 2 model: Prediction of the slope. The predictors tested in the intercept were subsequently entered in the same order in the model for the prediction of the interaction quality slope for sadness. Perceived social competence variability was the first predictor entered. Congruent with expectations, perceived social competence variability was a significant predictor (t (100) = - 2.14, p < .05). These results are interpreted in the final model. The coefficients obtained are very similar to those obtained in the final model. This one-predictor model explained 10 % of the between-person variance in the interaction quality slope. Level of perceived social competence was then added to the equation for interaction quality. It was not a significant predictor (t (99) = -1.19, p > .10), whereas perceived social competence variability remained significant (t (99) = -2.38, p < .05). This model explained 11.3 % of the between-person variance in the interaction quality slope.

Next, emotional distress, popularity and stability of self were added to the slope's equation. Popularity was a significant predictor (t (96) = 1.99, p < .05), whereas emotional distress and stability of self were not significant (distress: t (96) = 0.31, p > .10; stability: t (96) = 1.46, p > .10). Regarding the other predictors, perceived social competence variability was marginally significant (t (96) = - 1.95, p = .05), as was level of perceived social competence (t (96) = -1.76, p < .10). The negative slope coefficient for perceived social competence level seemed to suggest that individuals with higher perceived social competence tended to have a stronger association between their perceptions of the quality of their peer interactions and their reactions of sadness. This model explained a sizable amount (18.9%) of the between-person variance

in the interaction quality slope for sadness.

Level 2 model with interaction term. The interaction term of perceived social

competence level multiplied by variability was then entered in both the intercept and the

interaction quality slope equations. The interaction term was a non-significant predictor

for the intercept (t (95) = 0.90, $p > .10$) and non-significant for the slope equation (t (95)

= -0.79, $p > .10$). The rest of the results remained virtually unchanged. This model

explained a slightly smaller amount (17.5%) of between-person variance in the slope than

the previous model.

Appendix N:

Step-by-step HLM Analyses for Anxiety

Level 2 model: Prediction of the intercept. The level 2 predictors were entered to

first model the random variation around the intercept and then around the interaction

quality slope for anxiety. In the first step, perceived social competence variability was

entered and was a significant predictor (t (100) = 2.37, p < .05). This model accounted

for 7.1 % of the between-persons variance in the intercept.

In the second step, level of perceived social competence was added. Perceived

social competence variability continued to remain a significant predictor (t (99) = 3.12, p <

.01). Perceived social competence level was also significantly and positively related to

anxiety (t (99) = 2.58, p < .05). This model explained a total of 12.2 % of the between-

persons variance.

In the third step, emotional distress, popularity and stability of self were added in

the prediction of the intercept. Congruent with hypotheses, emotional distress was a

significant predictor (t (96) = 2.40, p < .05). Popularity was not a statistically significant

predictor (t (96) = 1.24, p > .05) and neither was stability of self (t (96) = -1.55, p > .05).

Perceived social competence level and variability continued to be significant predictors.

The proportion of variance explained in the intercept increased to 18.5%.

Level 2 model: Prediction of the slope. The predictors were subsequently entered

in the model for the prediction of the interaction quality slope for anxiety. Perceived

social competence variability was marginally significant (t (100) = - 1.80, p < .10). This

model explained approximately 7.5 % of the between-person variance in the slope of

interaction quality.

In the next step, level of perceived social competence was added. Perceived social

competence variability now became a significant predictor (t (99) = -2.65, p < .01), and level of perceived social competence was marginally significant (t (99) = -1.69, p < .10). The amount of variance in the interaction slope explained by the model increased slightly to 8.4 %.

Next, emotional distress, popularity and stability of self were added to the slope's equation. Emotional distress was not a significant predictor (t (96) = 0.99, p > .05) and neither was popularity (t (96) = 0.92, p > .05) nor stability of self (t (96) = -0.38, p > .05). Perceived social competence variability remained the only significant unique predictor (t (96) = - 2.75, p < .01) and level of perceived social competence became a non-significant predictor (t (96) = -1.21, p > .05). This model explained 8.9% in the interaction slope variance.

Level 2 model with interaction term. The interaction term of perceived social competence level multiplied by variability was entered in the intercept equation and the interaction quality slope. The interaction term was a non-significant predictor in the intercept equation (t (95) = 0.85, p > .10) and non-significant in the slope equation (t (95) = -0.79, p > .10). The rest of the results remained basically unchanged. Not surprisingly, the addition of the interaction term did not significantly add to the amount of variance explained. This model explained 17.7 % of the between-person variance in the intercept and 7.1% of between-person variance in the slope.

Appendix O:

Step-by-step HLM Analyses for Anger

Level 2 model: Prediction of the intercept. In the first step, perceived social competence variability was entered and consistent with hypothesis, results showed that it was a significant predictor (t (100) = 3.62, p < .05). This model explained 10.5 % of the between-persons variance in the level of anger. In the second step, level of perceived social competence was added. Perceived social competence level was a significant predictor (t (99) = 2.03, p < .05) and competence variability continued to remain a significant predictor (t (99) = 4.18, p < .05). This model explained approximately 12.9 % of the between-persons variance.

In the third step, emotional distress, popularity and stability of self were added. None of the new predictors was statistically significant (emotional distress, t (96) = 1.10, p > .05; popularity, t (96) = 0.45, p > .05; stability of self, t (99) = -1.62, p > .05). Perceived social competence level and variability continued to be significant predictors. Although their unique contribution was non significant, the predictors in the model contributed to explaining some common between-person variance for a total of 15%.

Level 2 model: Prediction of the slopes. Contrary to hypotheses, perceived social competence variability, the first predictor entered, was not a significant predictor of the interaction quality slope (t (100) = - 0.40, p > .05), nor was it a significant predictor for the importance slope (t (100) = 0.64, p > .05). This model did not explain any between-person variance in the slopes of interaction quality and importance. In fact the variance estimates increased slightly.

Level of perceived social competence was then added. It was not a significant predictor for the interaction quality slope (t (99) = -0.52, p > .05) or for the importance

slope (t (99) = 0.22, p > .05). Perceived social competence variability remained a non-significant predictor for both slopes. Once more, the model did not explain any between-person variance.

In the next step, emotional distress, popularity and stability of self were added to the interaction quality slope equation. As mentioned before, these predictors were not entered in the importance slope equation. Emotional distress was a significant predictor (t (96) = -2.32, p < .05) but popularity and stability of self were not significant (popularity: t (96) = 1.50, p > .05; stability: t (96) = -0.88, p > .05). The findings for the intercept and the importance slope did not change. This model explained a modest 2.2 % of the between-person variance in the interaction slope.

Level 2 model with interaction term. The interaction term of perceived social competence level times variability was entered in the intercept equation and in the interaction quality and importance slope equations. The interaction term was non-significant predictor in all three equations (for the intercept: t (95) = 0.46, p > .05; interaction quality: t (95) = -0.08, p > .05; importance: t (98) = -0.91, p > .05). Other results remained unchanged. Not surprisingly, the addition of the interaction term did not significantly add to the amount of variance explained. This model explained 15.3 % of the between person variance in the intercept, 3.4% of between-person variance in the interaction quality slope and no between-person variance in the importance slope.

Appendix P:

Step-by-step HLM Analyses for Positive Affect

Level 2 model: Prediction of the intercept. The first predictor entered for the intercept of positive affect was perceived social competence variability. It was a significant predictor (t (100) = - 2.07, $p < .05$). Congruent with hypotheses, participants with higher perceived social competence variability generally reported less positive affect following peer interactions. This model accounted for 3.7 % of the between-persons variance in the intercept for positive affect.

In the second step, level of perceived social competence was added. Perceived social competence level was also a significant predictor (t (99) = 4.45, $p < .01$). Congruent with hypotheses, as participants perceived themselves as more socially competent, they reported higher levels of positive affect following peer interactions. However, perceived social competence variability became a non-significant predictor (t (99) = 0.10, $p > .05$). The addition in the model brought the proportion of variance explained in the level of positive affect to 17.9 % (up from 3.7%).

In the third step, emotional distress, popularity and stability of self were added to the equation. Emotional distress was a significant predictor (t (96) = -3.33, $p < .01$). Popularity was non-significant (t (96) = -1.40, $p > .05$), and neither was stability of self (t (96) = 0.12, $p > .05$). Level of perceived social competence continued to be a significant predictor. The proportion of variance explained by this model was 25.8 %.

Level 2 model: Prediction of the slopes. The predictors were entered for the prediction of the interaction quality and importance slopes for positive affect. Perceived social competence variability was entered first. Congruent with hypotheses, perceived social competence variability was a significant predictor in the interaction quality slope (t

(100) = 2.47, p < .05) but it was non-significant for the importance slope (t (100) = -1.57, p > .05). Participants with more variable feelings of perceived social competence reported a stronger (positive) association between their perception of the interaction and their report of positive affective than participants with less variable perceived social competence. When the interaction was negative, individuals with variable perceived social competence experienced less positive affect than individuals with less variable perceived social competence. However, when the interaction was perceived as positive, all participants, regardless of the variability of their perceived social competence, reported high levels of positive affect. This model explained 8.4 % of the between-person variance in the slope of interaction quality and 1.4% of the between-person variance in the slope of importance.

Next, level of perceived social competence was added to both slope equations. It was not a significant predictor in the interaction quality slope (t (99) = -0.04, p > .05) nor was it significant in the importance slope (t (99) = 1.19, p > .05). The variance explained by this model dropped to 2.9 % (from 8.4%) in the interaction quality slope and to zero in the importance slope. The fact that the variance increased instead of decreasing or remaining stable suggests that a more parsimonious model (i.e., with fewer predictors) may be empirically preferable.

In the next step, emotional distress, popularity and stability of self were added to the interaction quality slope equation but not to the importance one. For the interaction quality slope, none of the new predictors was significant (emotional distress: t (96) = 0.42, p > .05; popularity: t (96) = -1.07, p > .05; stability of self: t (96) = -0.27, p > .05).

Perceived social competence variability became a non-significant predictor (t (96) = 1.45, p > .05). It seemed that once the common variance shared by all level 2 predictors was explained, there was little unique variance for perceived social competence variability to predict positive affect. The addition of these variables actually increased (instead of decreasing) the variance in the interaction quality slope and suggested, as in the previous model tested, that a more parsimonious model may be more useful empirically. However, to test all the hypotheses, the interaction term was tested in the next step.

Level 2 model with interaction term. The interaction term of perceived social competence level multiplied by variability was entered in the intercept, the interaction quality and importance slope equations. The interaction term was non-significant in the intercept equation (t (95) = -0.61, p > .05). However, it was a significant predictor in the interaction quality slope equation (t (95) = -2.21, p < .05) and in the importance slope equation (t (98) = 2.50, p < .05). The interpretation of these results was made in the final model. This model explained 25 % of the between-person variance in the intercept and 10.3 % of between-person variance in the importance slope. For the interaction quality slope equation, this model did not explain any variance.

Appendix Q:

Step-by-step HLM Analyses for Interaction Quality

Level 2 model: Prediction of the intercept. In the first step, perceived social

competence variability was entered. Perceived social competence was not a significant

predictor (t (100) = - 1.45, p > .05) and this model accounted for very little between-

person variance (< 1 %) in the perceptions of interaction quality.

In the second step, level of perceived social competence was added. Congruent

with hypotheses, perceived social competence level was a significant predictor (t (99) =

3.64, p < .05), with higher levels of perceived social competence predicting perceptions of

higher interaction quality. Perceived social competence variability remained a non-

significant predictor (t (99) = 0.54, p > .05). This model explained 13.3% of the between-

person variance.

In the third step of the equation, emotional distress, popularity and stability of self

were added. Emotional distress was a significant predictor (t (96) = - 2.47, p < .05). As

hypothesized, higher levels of emotional distress were predictive of lower ratings of

interaction quality. Neither popularity (t (96) =- 1.30, p > .05) nor stability of self (t (96)

= - 0.07, p > .05) were significant predictors of interaction quality. Perceived social

competence level remained significant (t (96) = 2.70, p < .01). This model brought the

total between-person variance explained to 19.3 %.

In the fourth step of the equation, the interaction term of perceived social

competence level times variability was added. The interaction term was marginally

significant (t (95) = -1.72, p < .10). Perceived social competence level (t (95) = 2.75, p <

.05) and emotional distress (t (95) = -2.59, p < .05) continued to be significant predictors

whereas all others remained non-significant. This model explained 20.2% of the between-

persons variance.

In the final model, the predictors entered were level of perceived social competence, emotional distress, the interaction term and variability of perceived social competence (as main effect). Perceived social competence level (t (97) = 2.57, $p < .05$) and emotional distress (t (97) = -2.96, $p < .05$) continued to be significant predictors. However, the interaction term was no longer significant (t (97) = - 1.42, $p > .10$) and neither was perceived social competence variability (t (97) = 0.73, $p > .10$). This model explained 19.3% of the between-person variance in the perception of interaction quality.

Appendix R:

Step-by-step HLM Analyses for Importance

Level 2 model: Prediction of the intercept. In the first step, perceived social competence variability was entered. Unexpectedly, results showed that perceived social competence variability was not a significant predictor (t (100) = 1.02, $p > .10$). This model accounted for virtually no between-person variance in importance. In the second step, level of perceived social competence was added to the equation. Perceived social competence level was a significant predictor (t (99) = 2.30, $p < .05$) and perceived social competence variability became a significant predictor once the shared variance with level of perceived social competence was taken into account (t (99) = 2.07, $p < .05$). As expected, perceived social competence variability was positively related to higher ratings of importance, and a higher level of perceived social competence was also positively related to higher ratings of importance. The addition of perceived social competence level explained 3.1 % of the between-person variance in importance ratings.

In the third step of the equation, emotional distress, popularity and stability of self were entered. None of the new predictors were significant (emotional distress: t (96) = - 1.46, $p > .05$; popularity: t (96) = 0.30, $p > .05$; stability of self: t (96) = 0.84, $p > .05$). Perceived social competence variability remained a significant predictor (t (96) = 2.32, $p < .05$) but perceived social competence level became a non-significant predictor (t (96) = 1.10, $p > .05$). This change in results suggested that the effect of perceived social competence level on importance was partially explainable by its overlap with the new variables, especially emotional distress (as suggested by the results of separate analyses not shown). The addition of these variables brought the proportion of variance explained to 3.9 %.

In the fourth step of the equation, the interaction term of perceived social competence level and variability was added. The interaction term predictor was non-significant (t (95) = - 0.50, p > .05). Perceived social competence variability now became marginally significant (t (95) = 1.87, p < .10). Higher levels of variability predicted higher perceived importance. All other predictors remained non-significant. The addition of the interaction term actually decreased the proportion of between-persons variance explained to 2.7% in the model for importance.

Appendix S:

Replication of HLM Analyses using Social Acceptance:

Emotion Scales

Sadness

In the fully saturated level 2 model, the statistically significant predictors of the intercept of sadness were social acceptance (t (95) = 2.27, p < .05) and perceived social competence variability (t (95) = 3.32, p < .05). Emotional distress was a marginally significant predictor (t (95) = 1.69, p < .10). The predictors of popularity, stability of self and the interaction term were not significant. In the final model with only significant predictors, these results remained unchanged.

In the prediction of the interaction quality slope, perceived social competence variability was marginally significant (t (95) = -1.73, p < .10) and popularity was marginally non-significant (t (95) = 1.60, p < .11). Social acceptance, emotional distress, stability of self and the interaction term were non-significant predictors. In the final model, perceived social competence variability was a significant predictor if entered alone (t (100) = -2.15, p < .05). If perceived social competence variability and popularity were entered together, they were both marginally significant (t (99) = -1.83, p < .10; t (99) = 1.85, p < .10, respectively). All other predictors remained non-significant.

In the final model for the prediction of sadness (see Table 19), social acceptance, perceived social competence variability and emotional distress explained 15.2 % of the between-person variance in the intercept; variability and popularity explained 15.1% in the slope. In summary, analyses using level of social acceptance produced a similar pattern of results, although popularity was a slightly weaker predictor in the interaction quality slope and perceived social competence level was not a significant predictor. All the effects were in the same direction as those previously presented and their interpretation was identical.

Table 19

Results of the Replication of Analyses in the Prediction of the Intercept and the

Interaction Quality Slope for Sadness

Predictors	Coeff.	Stand. error	t-ratio	Df	p-value	Variance uncond. model (τ_{ij})
Intercept						0.10
Intercept	1.21	0.03	39.24	98	< .001	
Social acceptance	0.09	0.04	2.16	98	.031	
Perc soc comp variab	0.42	0.12	3.47	98	.001	
Emotional distress	0.21	0.12	1.75	98	.080	
Popularity						
Stability of self						
Soc. accept x variab.						
Interaction quality slope						0.05
Intercept	- 0.12	0.03	- 4.33	99	< .001	
Social acceptance						
Perc soc comp variab	- 0.25	0.14	- 1.83	99	.067	
Emotional distress						
Popularity	0.07	0.04	1.85	99	.064	
Stability of self						
Soc. accept x variab.						
Importance slope						NA
Intercept	0.02	0.01	1.80	1133	.072	

Estimation of variance components after predictors in final model were entered						
	Variance	St. dev.	χ^2	Df	p-value	% var. explained
Intercept (τ_{00})	0.08	0.29	484.52	98	< .001	15.2
Inter. quality slope (τ_{10})	0.04	0.21	284.46	99	< .001	15.1

Note. In this model, the assumption of heterogeneity of variance was violated (as

indicated by a significant test of heterogeneity of variance not shown). The fixed effects

estimates are presented with robust standard errors, which are less susceptible to

violations of assumptions.

Anxiety

In the level 2 fully saturated model, the statistically significant predictors for the intercept were social acceptance and perceived social competence variability (t (95) = 2.65, $p < .01$; t (95) = 2.28, $p < .05$, respectively). Emotional distress was marginally significant (t (95) = 1.95, $p = .05$). Popularity, stability of self and the interaction term were not significant predictors. In the final model, social acceptance, perceived social competence variability and emotional distress were all significant predictors (t (98) = 3.17, $p < .01$; t (98) = 2.54, $p < .05$; t (98) = 3.30, $p < .01$, respectively).

In the prediction of the slope of interaction quality for anxiety, the pattern of results was the same as for the first set of analyses. When all predictors were entered, perceived social competence variability was the only statistically significant predictor (t (95) = - 2.56, $p < .05$). When entered alone in the final model (see Table 20), perceived social competence variability was marginally significant (t (100) = - 1.78, $p < .10$). The direction of the effect of perceived social competence was the same as in the first set of analyses: higher variability tended to accentuate the strength of the negative association between perceptions of interaction quality and emotional reactions of anxiety. Results also suggested that variability's effect at least partially overlapped with the effect of other predictors. The final model for the prediction of anxiety explained 15.5% of the between-persons variance in the intercept and 7 % of the variance in the interaction quality slope. Once more, the direction of the coefficients was identical and their size similar. The interpretation of the findings remained essentially the same.

Table 20

Results of the Replication of Analyses in the Prediction of the Intercept and the

Interaction Quality Slope for Anxiety

Predictors	Coeff.	Stand. error	t-ratio	Df	p-value	Variance uncond. mod (τ_{ij})
Intercept						0.09
Intercept	1.31	0.03	42.17	98	< .001	
Social acceptance	0.14	0.04	3.17	98	.002	
Perc soc comp variab	0.28	0.11	2.54	98	.011	
Emotional distress	0.44	0.13	3.30	98	.001	
Popularity						
Stability of self						
Soc. accept x variab.						
Interaction quality slope						0.04
Intercept	- 0.11	0.03	- 3.90	100	< .001	
Social acceptance						
Perc soc comp variab	- 0.16	0.09	- 1.78	100	.075	
Emotional distress						
Popularity						
Stability of self						
Soc. accept x variab.						
Importance slope						NA
Intercept	0.03	0.01	2.78	1134	.006	

Estimation of variance components after predictors in final model were entered

	Variance	St. dev.	χ^2	Df	p-value	% var. explained
Intercept (τ_{00})	0.08	0.28	482.82	98	< .001	15.5
Inter. quality slope (τ_{10})	0.04	0.20	212.76	100	< .001	7.0

Note. In this model, the assumption of heterogeneity of variance was violated (as

indicated by a significant test of heterogeneity of variance not shown). The fixed effects

estimates are presented with robust standard errors, which are less susceptible to

violations of assumptions.

Anger

The pattern of results was again the same as that of the first set of analyses. In the level 2 fully saturated model, social competence variability and emotional distress were significant predictors (variability: t (95) = 2.18, $p < .05$; distress: t (95) = 2.04, $p < .05$) and social acceptance was marginally significant (t (95) = 1.83, $p < .10$). Popularity, stability of self and the interaction term were non-significant. When variability, emotional distress and social acceptance were entered in the final model (presented on Table 21), all three remained statistically significant (variability: t (98) = 3.65, $p < .01$; acceptance: t (98) = 2.14, $p < .05$; distress: t (98) = 2.33, $p < .05$).

In the prediction of the slope of interaction quality for anger, the pattern of results was again similar to the first set of results. When all predictors were entered together, emotional distress was the only statistically significant predictor (t (95) = - 2.01, $p < .05$). When entered alone in the equation, the results remained unchanged. Social acceptance, perceived social competence variability, popularity, stability of self and the interaction term were all non-significant predictors.

No statistically significant predictors were found for the importance slope. The final model for the prediction of anger explained 14.1% of the between-persons variance in the intercept, 4 % of the variance in the interaction quality slope and no variance in the importance slope. The direction of all the coefficients was identical to the original set of findings and their interpretation remained the same. The size of the coefficients was very similar to that of the original set of analyses.

Table 21

Results of the Replication of Analyses in the Prediction of the Intercept and the

Interaction Quality and Importance Slopes for Anger

Predictors	Coeff.	Stand. error	t-ratio	Df	p-value	Variance uncond. mod (τ_{1j})
Intercept						0.12
Intercept	1.38	0.04	39.38	98	< .001	
Social acceptance	0.08	0.04	2.14	98	.032	
Perc soc comp variab	0.37	0.10	3.65	98	< .001	
Emotional distress	0.35	0.15	2.33	98	.020	
Popularity						
Stability of self						
Soc. accept x variab.						
Interaction quality slope						0.09
Intercept	- 0.35	0.04	- 9.28	100	< .001	
Social acceptance						
Perc soc comp variab						
Emotional distress	- 0.32	0.15	- 2.15	100	.031	
Popularity						
Stability of self						
Soc. accept x variab.						
Importance slope						0.01
Intercept	0.04	0.02	2.23	101	.026	
Social acceptance						
Perc soc comp variab						
Soc. accept. x variab.						

Estimation of variance components after predictors in final model were entered						
	Variance	St. dev.	χ^2	Df	p-value	% expl.
Intercept (τ_{00})	0.10	0.32	478.62	98	< .001	14.1
Inter. quality slope (τ_{10})	0.09	0.30	270.30	100	< .001	4.0
Importance slope (τ_{20})	0.01	0.09	148.03	101	.002	0.0

Note. In this model, the assumption of heterogeneity of variance was violated (as

indicated by a significant test of heterogeneity of variance not shown). The fixed effects

estimates are presented with robust standard errors, which are less susceptible to

violations of assumptions.

Positive Affect

When all predictors, including the interaction terms, were entered in the fully saturated model, emotional distress was the only statistically significant predictor for the intercept (t (95) = -4.45, $p < .05$). All other predictors were non-significant (all t (95) > - 1.5 or < + 1.5). In the prediction of the slope of interaction quality, the interaction term of social acceptance times variability was a marginal predictor (t (95) = - 1.66, $p = .10$). All other predictors were non-significant (all t (95) > - 1.5 or < + 1.5).

When the interaction term was entered with the main effects of level and variability, none of the three predictors was statistically significant (acceptance: t (98) = - 0.59, $p > .10$; variability: t (98) = 1.41, $p > .10$; interaction term: t (98) = - 1.32, $p > .10$). The effect of the interaction term seemed unreliable at best. Based on the step-by-step analyses (not presented), I chose to run a simpler model with perceived social competence variability as the only predictor for the interaction quality slope, and emotional distress in the intercept.

In the final model (see Table 22), emotional distress remained a significant predictor for the intercept (t (100) = - 5.79, $p < .05$) and explained 20.3% of its between-persons variance. Higher level of distress predicted lower levels of positive affect. For the interaction quality slope, perceived social competence variability was a statistically significant predictor (t (100) = 2.32, $p < .05$) and explained 10.5% of the between-persons variance. The results indicated that when the interaction was perceived as negative, individuals with high variability reported less positive affect than individuals with less variable perceived social competence. When the interaction was perceived positively,

however, they experienced more positive affect than individuals with low variability.

These effects are consistent with hypotheses and with results obtained with other outcome

variables. No significant predictors were found for the importance slope and no amount

of variance was explained in the importance slope. Overall, these results only partially

replicated the main findings: emotional distress was a significant predictor in both sets of

analyses; however, social acceptance was not a significant predictor, either alone for the

intercept, or in interaction with variability for the interaction quality or importance slopes.

Table 22

Results of the Replication of Analyses in the Prediction of the Intercept, the Interaction

Quality and Importance Slopes for Positive Affect

Predictors	Coeff.	Stand. error	t-ratio	Df	p-value	Variance uncond. model (τ_{ij})
Intercept						0.31
Intercept	3.62	0.05	69.93	100	< .001	
Social acceptance						
Perc soc comp variab						
Emotional distress	-0.98	0.17	-5.79	100	< .001	
Popularity						
Stability of self						
Soc. accept. x variab.						
Interaction quality slope						0.03
Intercept	0.43	0.03	14.76	100	< .001	
Social acceptance						
Perc soc comp variab	0.18	0.08	2.32	100	.021	
Emotional distress						
Popularity						
Stability of self						
Soc. accept.x variab.						
Importance slope						0.01
Intercept	-0.01	0.01	-0.88	101	NS	
Social acceptance						
Perc soc comp variab						
Soc. accept. x variab.						

Estimation of variance components after predictors in final model were entered						
	Variance	St. dev.	χ^2	Df	p-value	% expl'd
Intercept (τ_{00})	0.25	0.50	1080.83	98	< .001	20.3
Inter. quality slope (τ_{10})	0.03	0.16	156.91	100	< .001	10.5
Importance slope (τ_{20})	0.01	0.08	146.49	101	.002	0.0

Note. In this model, the assumption of heterogeneity of variance was violated (as

indicated by a significant test of heterogeneity of variance not shown). The fixed effects

estimates are presented with robust standard errors, which are less susceptible to

violations of assumptions.

Appendix T:

Replication of HLM Analyses using Social Acceptance:

Perception of the Interaction

Interaction Quality

When the analyses on interaction quality were replicated using social acceptance instead of the average level of perceived social competence, the pattern of results was somewhat different. In the fully saturated model, emotionally distress was a statistically significant predictor (t (95) = - 2.96, p < .05) and social acceptance was a marginally significant predictor (t (95) = 1.73, p < .10). These results were consistent with those of the first set of analyses and suggested that highly distressed participants experienced their peer interactions as less positive than individuals who were not distressed and that higher perceived social acceptance predicted more positive perceptions of one's peer interactions. Perceived social competence variability, popularity, stability of self and the interaction term were all non-significant predictors when entered together.

When social acceptance and emotional distress were entered in the final model, only emotional distress was a significant predictor (t (99) = - 4.22, p < .05) and social acceptance was not (t (99) = 0.54, p > .05). These findings suggested the effect of self-perceived acceptance were not as consistent nor uniquely predictive as were the effects of emotional distress; rather, they were at least partially due to shared variance with other variables. The final model explained 13.5% of the between-persons variance in perceptions of the interaction quality and left significant amounts of unexplained variance.

Importance

When the analyses on importance were replicated using social acceptance as a main effect and in the interaction term, the results were virtually identical. Perceived social competence variability was the only marginally significant predictor (t (95) = 1.81, p

< .10) and all other predictors were non-significant. The effect was the same as found previously: higher variability predicted higher level of perceived importance. The model explained 3.3% of the between-persons variance in perceptions of importance. These findings, as those of the main set of results, are consistent with the hypothesis that adolescents with variable feelings of perceived social competence tend to perceive peer interactions as more important than do adolescents with less variable feelings.