Use of humor as a coping mechanism, psychological adjustment, and social interaction

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Abstract

For two weeks, 286 participants used the Rochester Interaction Record to describe their social interactions. They also completed the Coping with Humor Scale and measures of depression, social skills, loneliness, and social anxiety. Scores on the CHS were positively related to how pleasurable people found their interactions, how confident they felt in their interactions, and how much time they spent with others. Moreover, the strength of these relationships was moderated by depression, but not by other measures of adjustment. These relationships were stronger for people who were less depressed.

In contemporary society the world over, humor and laughter are frequently presumed to be means people can use to cope with life's difficulties (Ziv 1988). Such cultural beliefs are reflected in slogans such as "Laughter is the best medicine," and in lyrics such as "Let a smile be your umbrella" and "Pack up your troubles in your old kit bag and smile, smile, smile." Consistent with such recommendations, research on the relationships between laughter and coping with stress has found that people can and do use humor to cope with stress and adversity. Moreover, this research suggests that there are meaningful individual differences in the extent to which people do this.

The present study was intended to expand our understanding of people's use of humor as a coping mechanism by examining the relationships between this construct and people's day-to-day social lives and their general psychological adjustment. The study was guided by the general hypothesis that the use of humor as a means of coping would be positively related to the quality of people's social lives. This hypothesis was based

primarily on research demonstrating that laughter and a sense of humor are associated with more positive and rewarding interpersonal encounters. For example, studies of meetings between strangers (Grammer 1990), friends conversing (Lampert and Ervin-Tripp 1998, Norrick 1993), and judgements of contrived scripts (Derks and Berkowitz 1989) have found that laughter has a positive impact on people's reactions to interpersonal encounters. Cann et al. (1997) found that shared laughter could overcome an otherwise negative reaction to a dissimilar stranger.

In this study, the role of humor in people's social lives was measured using the Coping with Humor Scale (CHS: Lefcourt and Martin 1986). The CHS was chosen over the many available instruments for evaluating humor appreciation and use (Ruch 1998) because we were interested in relationships among social interaction, psychological adjustment, and humor. The CHS measures behaviors that are directly relevant to using humor to moderate potential stress, which was an aspect of humor that we believed was particularly relevant to social interaction and psychological adjustment.

Existing research suggests that the CHS measures a very specific aspect of humor. For example, the CHS correlates only modestly with Situational Humor Response Questionnaire, a measure of the general propensity to laugh (Kuiper and Martin 1993, Ruch 1994). Similarly, unpublished analyses of data (Ruch p.c.) presented in Kohler and Ruch (1996) show that using humor to cope is not correlated with humor appreciation *per se*. The CHS possesses divergent validity and was the most appropriate measure for studying the constructs of interest.

Although research on how humorous people are and the quality of interpersonal encounters has consistently found positive relationships between the two constructs, this research is somewhat limited. With some exceptions (e.g., Kuiper and Martin 1998b), most studies have concerned a limited number of encounters (typically a single event) that have occurred in artificial environments (typically some sort of laboratory setting). The present study extended and complemented this research by examining relationships between people's use of humor and characteristics of their everyday social interactions.

Everyday social interaction was measured using a variant of the Rochester Interaction Record (RIR: Wheeler and Nezlek 1977), a well-validated measure of daily social interaction. In studies using the RIR, people use a fixed format record to describe the social encounters they have every day for some fixed period of time. These descriptions include

the date and time the interaction began, how long it lasted, who was present, and ratings of the event on various dimensions.

In this study, participants maintained the RIR for two weeks, and in addition to indicating time of onset, length, and others who were present, they indicated how enjoyable and intimate each interaction was and how much influence they felt they had over the interaction. These ratings were chosen because they represent three important attributes of social interaction (Nezlek and Pilkington 1994). The primary hypothesis of the study was that individual differences in coping with humor would be positively related to how enjoyable and intimate people found their social interactions to be and how confident they were in social interaction.

In keeping with the emphasis of previous research, the previous discussion has concerned people's reactions to interactions; however, unlike laboratory based studies which typically rely on measures of single occasions, in RIR studies people describe all their social interactions, and so the RIR also provides measures of how socially active people are. It was difficult however, to form clear hypotheses about relationships between CHS scores and quantity of social interaction.

On the one hand, one might expect that popularity (and by implication amount of social contact) is positively related to the use of humor as a means of coping. Individuals who deal with adversity by trying to make light of it or by cheering people up might be more popular than those who do not. On the other hand, a growing body of research suggests that psychological adjustment and social skills are unrelated to social activity (Maragoni and Ickes 1989). For example, Nezlek et al. (1994) and Nezlek et al. (2000) found that quantity of interaction was unrelated to depression, and Nezlek (2001a) found that social skills were also unrelated to quantity of interaction. Given these findings, relationships between CHS scores and quantity of interaction were examined on a somewhat exploratory basis.

An important consideration when conducting naturalistic, correlational research (such as this study) is controlling for the possibility of mediating and moderating roles of "third variables." For example, relationships between reactions to interactions and CHS scores might reflect the variance CHS scores and reactions share with a third construct. More specifically, enjoyment, intimacy, and influence in everyday interactions have been found to be negatively related to reports of depressive symptoms (Nezlek et al. 1994, Nezlek et al. 2000), and CHS scores have also been found to be negatively related to reports of depressive symptoms

in response to stress (Martin and Lefcourt 1983, Nezu et al. 1988). This common variance meant that the moderating and mediating roles played by psychological adjustment needed to taken into account when evaluating relationships between CHS scores and social interaction. Accordingly, measures of various dimensions of psychological adjustment (including two of the more important, depression and anxiety) were also collected.

In a similar vein, much of the previous research on social interaction has found between- and within-subject sex differences (e.g., Nezlek et al. 1983). Between-subject effects represent differences in the interactions of men and women, and within-subject effects represent differences in interactions occurring with men and women. Within-subject effects have typically been discussed in terms of whether an interaction involved only same-sex others, only opposite-sex others, or others of each sex, and sex effects have frequently been referred to as a sexual composition effect. Accordingly, the study also determined if CHS effects varied as a function of participant sex and/or the sexual composition of interaction.

Methods

Participants

Participants were 286 students at the College of William & Mary, 163 women and 123 men, of whom 83 were first-semester freshmen, 120 were second-semester freshmen, and 83 were juniors. The two freshmen samples were recruited from students in introductory psychology classes who had indicated on a questionnaire that they were interested in participating in a study of daily social interaction. The sample of juniors was recruited from a group who had participated in a previous study. All were paid $20 for participating.

Measures

Social interaction was measured using a variant of the Rochester Interaction Record (RIR; Wheeler and Nezlek 1977). On a standard form, participants described their social interactions by indicating who their cointeractants were for up to three different people. They used unique initials to describe each cointeractant, and they indicated the sex of each

of these people. If more than three others were present, they simply indicated how many other men and women were present. The date and time each interaction began and how long it lasted were also recorded, and participants rated each interaction on three dimensions, enjoyment, intimacy, and confidence. These ratings were made using 9-point scales, labeled 1 = not, 3 = slightly, 5 = somewhat, 7 = quite, and 9 = very, labels chosen to represent roughly equal intervals (Cliff 1959).

The Coping with Humor Scale (Lefcourt and Martin 1986) was used to measure individual differences in the use of humor as a coping strategy. Psychological adjustment was measured using the Beck Depression Inventory (Beck 1967), the Interaction Anxiousness Scale (Leary 1983), the UCLA Loneliness Scale (Russell et al. 1980), and the Texas Social Behavior Inventory (Helmreich and Stapp 1974), a measure of social self-esteem and social competence. Each of these scales is a reliable, valid, and widely used measure of its respective construct.

Instructions to participants

During an introductory meeting, the importance of understanding social interaction was explained, and the participants' role as collaborators in this naturalistic research was emphasized. Participants were told that the study concerned people's daily social lives and that they would use a structured form to describe their social interactions. The instructions were modeled closely after those introduced by Wheeler and Nezlek (1977).

Participants were told to use the RIR to describe all their social interactions that lasted ten minutes or longer for two weeks. Interactions were defined as encounters with another person (or people) in which the participants attended to one another and adjusted their behavior in response to one another, a definition similar to Goffman's (1971) definition of a ''social with.'' Examples were provided to clarify what was an interaction, such as going to dinner, and what was not (sitting next to a stranger while watching a movie and not talking at all).

The response categories on the RIR were discussed until participants understood their definitions and felt comfortable with the forms and the procedure. Enjoyment was defined as how pleasurable or satisfying the participant found each interaction to be. Intimacy was defined as how interpersonally close an individual felt to the other people present, with

specific mention that "intimacy does not have to be sexual, nor does it have to be evident only through conversation." Confidence was defined as "how self-assured you were and how competent you felt." These definitions are similar to those used in previous studies.

Participants were told to complete the records at least once a day at a uniform time, such as before going to sleep, and to skip days that were forgotten or missed. They were given enough forms for the duration of the study and an instruction booklet containing the instructions provided during the meeting. After three days, they were contacted to see if they were having any problems maintaining the diary; none was reported.

At the conclusion of the record-keeping period, participants were interviewed individually about the difficulties they had maintaining the diary and the potential sources of inaccuracy in their data. They were encouraged to be candid when describing their compliance with instructions and were told they would be paid regardless of what they said about how they maintained their diaries.

Participants maintained their diaries an average of 14.5 days, and they reported updating their diaries an average of 1.8 times per day and spending an average of 15 minutes per day doing this. Participants' answers to other questions about how they maintained the diary were very similar to those given by participants in other RIR studies (cf. Nezlek et al. 1983). Moreover, participants' responses strongly suggested that they maintained their diaries in accordance with instructions and that their diaries accurately represented their social lives. In the interest of brevity, these data are not presented. Following the interview, participants completed the CHS and the measures of psychological adjustment, they were paid, and their questions about the study were answered.

Results

Overview of analyses

Given concerns expressed by Martin (1996) about the internal consistency of the seven items comprising the CHS, the first step in the analyses was an evaluation of the psychometric properties of the CHS. Next, the relationship between participants' CHS scores and their day-to-day social interactions were examined. These analyses also took into account the joint effects of CHS and psychological adjustment on social interaction.

Some analyses examined reactions to interaction such as how enjoyable people found their interactions to be, and others examined quantity of interaction such as how many interactions they had each day.

Psychometric properties of the Coping Humor Scale

The CHS was originally proposed as a seven-item scale; however, in a review of an extensive set of studies, Martin (1996) suggested that these seven items may not be equally valid measures of the underlying construct. In light of this, and to further our understanding of the CHS, a series of analyses were conducted to evaluate the psychometric properties of the CHS.

The results of confirmatory factor analyses (CFA) using EQS (Bentler 1998) supported Martin's (1996) conclusion that item four of the scale 'I must admit my life would probably be easier if I had more of a sense of humor' was a relatively poor measure of the latent construct. A CFA of all seven items assuming a single-factor model found that the coefficient for this item was not reliably different from 0 (standardized coefficient $= -.099$, $z = 1.47$), whereas the coefficients for all six other items were reliably different from 0 (all zs > 5.0). A CFA assuming a single-factor model of items 1, 2, 3, 5, 6, and 7 produced a comparative fit index (Bentler 1988) of .94, and all six coefficients were reliably different from 0 (all zs > 5.0), suggesting that these six items were good measures of the latent construct. Cronbach's alpha for the six-item scale was .75. The factor coefficients from this analysis are presented in Table 1.

Table 1. *Humor Coping Scale: Factor coefficients for six retained items*

Item	Coefficient
I often lose my sense of humor when I'm having problems	$-.38$
I have often found that my problems have greatly reduced when I tried to find something funny in them	.56
I usually look for something comical to say when I am in tense situations	.68
I have often felt that if I am in a situation where I have to either cry or laugh, it's better to laugh	.42
I can usually find something to laugh or joke about even in trying situations	.77
It has been my experience that humor is often a very effective way of coping with problems	.69

The coefficients from this analysis were used to produce factor scores, and these factor scores were used as the measure of individual differences in humor coping in the analyses presented below. It should be noted however, that the results of analyses using composite scores (either the mean of the six items with item 1 reverse-scored or the mean of all seven items with items 1 and 4 reversed) were not meaningfully different from the results presented in this article. To permit comparisons with other research, note that the mean score for the six-item scale was 18.1 (sd = 1.4), the mean score for the full seven-item scale was 20.8 (sd = 1.4), and the correlation between scores on these variants was .96.

Relationships between CHS scores and psychological adjustment

Understanding the nature of the joint effect of two variables requires knowing the correlation between the variables, and correlations between CHS scores and measures of adjustment are presented in Table 2. Although the correlations between CHS scores and measures of adjustment were all statistically significant, they were not strong. With a sample of 286, correlations with an absolute value greater than .15 are significant at the .01 level. People who were better adjusted tended to have higher CHS scores, but this tendency was not pronounced.

Analytic strategy

Traditionally, social interaction diary data such as those collected in this study have been analyzed using within-person summary measures such as average enjoyment of interaction and average number of interactions per day. In turn, relationships between such summary measures and other individual differences such as scores on personality scales have been

Table 2. *Correlations between CHS scores and measures of psychological adjustment*

	CHS	BDI	UCLA	TSBI
BDI-Depression	−.16			
UCLA-Loneliness	−.15	.51		
TSBI-Social self-esteem	.21	−.24	−.50	
ANX-Social anxiety	−.21	.34	.36	−.67

examined using ordinary least squares (OLS) techniques such as correlations or ANOVA. These procedures and a rationale for them were introduced by Wheeler and Nezlek (1977) and are discussed in detail by Nezlek and Wheeler (1984). Although these procedures have provided empirical support for various hypotheses (Nezlek et al. 1983; Reis and Wheeler 1991), developments in statistics, computational algorithms, and computer hardware and software have made available procedures that provide important advantages over these types of analyses. These new procedures are generally referred to as multilevel random-coefficient models.

The multilevel random-coefficient modeling analyses we used examined the same types of relationships as the previous OLS analyses, but provided more accurate estimates of such relationships. The specific technique is called hierarchical linear modeling (HLM; Bryk and Raudenbush 1992). The logic of these analyses was fairly straightforward. For each person, coefficients were estimated representing their social interactions. Some coefficients represented reactions to interactions, others represented how socially active people were. These coefficients were functionally equivalent to within-person averages, for example, average enjoyment of interactions or average number of interactions per day. These coefficients were then analyzed using regression-like models that examined relationships between these "within-person averages" and other variables.

Other examples of using HLM to analyze social interaction diary data can be found in Nezlek (1999) and Nezlek et al. (2000), and an overview of using multilevel random coefficient modeling to analyze various types of data can be found in Nezlek (2001b). A more detailed description of the specific analyses used in the present study is presented in Appendix A.

CHS and ratings of interaction

As expected, the analysis of enjoyment of social interactions produced a significant main effect for CHS scores ($t = 2.43$, $p = .01$). The mean enjoyment score was 6.71, and a common way to present effects in regression analyses is to compare predicted scores for people 1 sd above and below the mean on the predictor variables. The predicted mean enjoyment for people 1 sd below the mean CHS was 6.59, and for people 1 sd above the mean it was 6.83.

Also as expected, the analysis of how confident participants felt in their social interactions produced a significant main effect for CHS scores ($t = 3.62$, $p < .01$). The mean confidence score was 7.02 and the predicted mean rating of confidence for people 1 sd below the mean CHS was 6.80, and for people 1 sd above the mean it was 7.24. In contrast to these results, analyses of perceived intimacy of interaction produced no significant effects for CHS.

Moderating effects of psychological adjustment

The joint effects of psychological adjustment and CHS scores on social interaction were examined in additional sets of analyses, one set for each measure of adjustment. First, following the recommendation of Aiken and West (1991), measures of adjustment were standardized. These standardized variables were then cross-multiplied with CHS scores (already standardized because they were factor scores) to form interaction terms, and measures of social interaction were analyzed as a function of CHS scores and each measure of adjustment.

These analyses found that the CHS main effects for enjoyment and confidence reported above varied as a function of BDI scores, whereas they did not vary as a function of social anxiety, loneliness, and social self-esteem. The analysis of enjoyment in social interaction produced a significant interaction of CHS and BDI scores ($t = 2.34$, $p < .05$), as did the analysis of confidence ($t = 2.03$, $p < .05$). To understand these statistical interactions, the coefficients estimated in these analyses were used to predict scores for people 1 sd above and below the mean on the CHS and BDI. These predicted scores indicated that the relationship between CHS and enjoyment and between CHS and confidence was stronger for people with lower BDI scores than for those with higher BDI scores. Predicted scores illustrating these relationships are presented in Table 3.

Frequently, studies of social interaction have found that relationships between social interaction and other measures vary as a function of the sexual composition of social interactions, i.e., whether interactions are with same- or opposite-sex others or involve members of both sexes. Accordingly, analyses were conducted to determine if the relationships reported above varied as a function of the sexual composition of social interaction; these analyses found that they did not. Finally, analyses examining if relationships between CHS and enjoyment and

Table 3. *Predicted enjoyment and confidence scores and minutes spent per day with other people as a joint function of CHS and BDI scores*

	BDI	
	Low	High
Enjoyment		
Low CHS	6.67	6.49
High CHS	7.07	6.53
Confidence		
Low CHS	6.88	6.72
High CHS	7.52	6.88
Minutes per day		
Low CHS	293	315
High CHS	353	311

Note: Low and High CHS are respectively, predicted values for people 1 sd below and above the mean on CHS, and Low and High BDI are predicted values for people 1 sd below and above mean BDI.

confidence varied as a function of participant sex and year in school found that the CHS main effects did not vary as a function of sex or year in school.

CHS and quantity of interaction

Quantity of social interaction was measured in two ways, number of interactions per day and time spent per day in interaction. Analyses of number of interactions per day found no significant effects for CHS scores and no significant interactions between CHS scores and participant sex or year in school. In contrast, analyses of amount of time people spent per day in interaction of all types produced a marginally significant effect for CHS scores ($t = 1.75$, $p = .08$). The mean time spent per day in interaction was 330 minutes, and the predicted mean time spent per day for people 1 sd below the mean CHS was 317 minutes whereas for people 1 sd above the mean it was 343.

Follow-up analyses that took into account the sexual composition of interactions found that the CHS effects from the analyses of all social contacts were due primarily to relationships between CHS and amount of same-sex and mixed-sex contact. There were no significant CHS effects in the analyses of opposite-sex contact. Unexpectedly, analyses that

included year in school indicated that the CHS effect in this analysis was significant only for first-semester freshmen and for juniors.

Analyses of the joint effects of psychological adjustment and CHS indicated that the CHS effect for time per day in interaction varied as a function of BDI scores, but not as a function of social anxiety, loneliness, and social self-esteem. There was a significant interaction of CHS and BDI scores ($t = 2.39$, $p < .05$). These predicted scores indicated that the relationship between CHS and time per day was stronger for people with lower BDI scores than for those with higher BDI scores. Predicted scores illustrating this relationship are presented in Table 3. Follow-up analyses did not suggest that this pattern characterized any type of social interaction (same-, opposite-, or mixed-sex) more than any other type.

Discussion

As expected, the present results suggest that people's use of humor as a means of coping with stress is positively related to how enjoyable their social lives are and to how confident they feel when interacting with others. There appears to be no relationship however, between coping with humor and the closeness people experience with others (intimacy). Moreover, there may be a weak positive relationship between coping with humor and social activity *per se*, although this relationship was inconsistent across different measures of activity and across subsamples in the study.

The positive relationships between humor coping and enjoyment and confidence in social interaction and between humor coping and quantity of social interaction are relatively easy to understand. Compared to those who do not, people who use humor to cope may make light of their own problems, easing the burden experienced by others, and they may provide others with more palatable (more humorous and less serious) forms of support, particularly appropriate for minor day-to-day problems. Such ease and success may translate into greater enjoyment and a greater sense of efficacy (confidence) in day-to-day interaction.

Although these relationships confirmed our expectations, we also found strong interactions between coping with humor and depression in these analyses. When interpreting these statistical interactions it is important to keep in mind that depression and humor coping were not strongly related.

That is, relatively more depressed people used humor as a coping mechanism almost as frequently as those who relatively less depressed. Such a relationship is consistent with previous research suggesting that the relationship between humor coping and general optimism is "quite weak at best" (Kuiper and Martin 1998a: 166).

The statistical interaction between humor coping and depression lends itself to a relatively straightforward interpretation. Psychological adjustment and use of humor to cope had additive effects on enjoyment and confidence in social interaction and on quantity of interaction. That is, people who were less depressed and who used humor to cope had the most active and rewarding social interactions compared to people with other combinations of these traits. Although a lack of depressive symptoms and the use of humor to cope were independently associated with more and more rewarding social interactions, the combination of low symptoms and high use seemed to be particularly beneficial. These results suggest that neither a positive outlook (as indicated by lack of depressive symptoms) nor the ability to make light of one's difficulties (humor coping) is sufficient for optimal well-being. Those who derived the greatest rewards from contact with others had both a positive outlook and made light of their difficulties.

Regardless of how the interaction of depression and humor coping is explained, it is noteworthy that relationships between humor coping and social interaction did not vary as a function of other measures of adjustment that were correlated with depression. The fact that depression moderated relationships between coping and interaction whereas other types of adjustment did not is consistent with some previous research. For example, Nezu et al. (1988) found that depression was moderated over time by individuals who said they used humor to cope, whereas anxiety was not.

Differences in the moderating effects of different types of adjustment on the relationships between humor coping and social interaction may be due to differences in the affective components comprising different types of adjustment. A growing body of research suggests that depression is associated with a diminished tendency to experience positive affect (PA) combined with an increased tendency to experience negative affect (NA) (Watson et al. 1988). In contrast, anxiety appears to be primarily a function of an increased tendency to experience NA. Humor (laughter, high spirits, etc.) may change or be related to both PA and NA, and so the affective systems involved in humor may be more similar to

the affective systems involved in depression than to those involved in anxiety. Unfortunately, PA and NA were not measured in this study, and so confirmation of this explanation must await further research.

No single study can examine all aspects of a particular phenomenon, and the present study was limited in some regards. For example, it is not clear how generalizable the present results are. The social interactions of collegians may be influenced by and reflect different processes than the interactions of other populations. Moreover, although there was meaningful variability in participants' reports of their depressive symptoms, it is not clear if the relationships found in this study would be found in a study examining the severely or clinically depressed, an issue discussed in detail by Flett et al. (1997). Although previous research suggests that the relationships between social interaction and depression are similar for non-clinically depressed collegians and clinically depressed adults (Nezlek et al. 1994; Nezlek et al. 2000), the comparability between such samples of the types of relationships found in this study needs to be determined explicitly.

In addition to concerns about the generalizability of the present results, our findings are somewhat limited by the strength of the relationships between social interaction and the CHS and BDI. Although there is some debate about the appropriateness of estimating shared variance in multilevel random coefficient models (Kreft and deLeeuw 1998), preliminary calculations suggest that the CHS and BDI accounted for approximately only four percent of the variance in enjoyment and confidence. Assuming such estimates are accurate leads to the conclusion that coping with humor plays a somewhat minor role *across all* of an individual's social interactions. It is important to keep in mind however, that such a conclusion leaves open the possibility that coping with humor plays important roles in some social interactions, but not in others. Coping with humor refers to how people use humor to cope with problems or stress, and so use of humor to cope may be irrelevant to social interactions that do not involve some sort of problem or stress. The generally high ratings of social interactions suggest that non-problematic, non-stressful interactions are the norm, and if this is so, there may have been relatively few opportunities for individual differences in coping with humor to manifest themselves. Future research needs to examine more explicitly social interactions for which coping with humor is relevant to determine the strength of the relationship between coping with humor and interaction outcomes.

Finally, the design of the present study does not provide a strong basis for causal inference. Similar to an assumption commonly made in studies of personality, we have tacitly assumed that individual differences in humor coping and depression somehow cause or lead to differences in social interaction. It is possible however, that successful interactions lead people to feel less depressed and to realize that humor can be an effective way of coping with stress and problems. More definitive answers to questions about causal relationships among these constructs will require examining how they covary across time.

Notes

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Appendix

The data were analyzed using hierarchical linear modeling (HLM, Version 4.03; Bryk et al. 1998) because the data constituted a hierarchically nested data structure in that observations at one level of analysis (interactions and days) were nested within another level of analysis (people). HLM was chosen over more traditional (OLS) methods because the HLM analyses had the same focus as the analyses used in the past but provided important advantages over them. For example, HLM uses a combination of Bayesian and maximum-likelihood procedures that separates the total variance of a parameter into true and error variance, whereas in OLS analyses, true and error variance are not separated. By separating true and error variance, HLM provides more accurate parameter estimates than OLS analyses. Moreover, HLM takes into account differences across participants in the number of interactions they record and the reliability of their responses, whereas standard OLS analyses of aggregated means do not. A detailed description of the advantages of HLM over more traditional analyses can be found in Bryk and Raudenbush (1992).

Using HLM, the data were analyzed with a series of regression-like hierarchically nested models in which coefficients from one level of analysis were analyzed at the next level. One set of analyses focused on reactions to social interaction, and a second focused on quantity of interaction. Ratings of interactions were conceptualized as interaction-level phenomena, and interactions were analyzed as nested within participants. Quantity of interaction was conceptualized as a day-level phenomenon. For each day a participant maintained the diary, the number of interactions recorded and total time they spent per day in interaction were calculated, and days were analyzed as nested within participants. Models and analyses are described using the nomenclature presented in Bryk and Raudenbush (1992).

In these analyses, interaction- and day-level phenomena were modeled at what is called level-1, and interactions and days were the units of analysis at level-1. In turn, individual differences in interaction- and day-level phenomena were analyzed at what is called level-2, and the individual participant was the unit of analysis at level-2. In HLM terminology, a level-1 model was estimated for each level-2 unit (or participant), and the coefficients in these models represented means of interaction variables for each participant. The

level-1 model was:

$$y_{ij} = \beta_{0j} + r_{ij}.$$

In these models, β_{0j} was a random coefficient representing the mean of y_{ij} across all observations (interactions or days, subscripted i) for each participant (subscripted j), and r_{ij} represented residual variance (error). For the analyses of quantity of interaction, β_{0j} represented an individual's mean for a measure of interaction quantity such as number of interactions per day, and for the analyses of reactions to interaction, β_{0j} represented an individual's mean enjoyment, intimacy, or confidence. The 286 participants in the study described 23,519 interactions over 4,142 days.

Relationships between use of humor as a coping strategy and social interaction were examined by analyzing the coefficients representing the means (the β_{0j}s) from the interaction- and day-level models. The basic person-level model was:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(CHS) + u_{0j}.$$

Relationships between CHS and interaction measures were tested by the significance of the γ_{01} coefficient. The interactive effects of CHS and measures of psychological adjustment were tested with a similar set of equations that included terms representing the interaction of CHS and a measure of psychological adjustment. For example, the moderating relationship of depression was examined with the following person-level model:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}(CHS) + \gamma_{02}(BDI) + \gamma_{03}(CHS\text{-}BDI) + u_{0j}.$$

Moderating effects of these constructs were tested by the significance of the γ_{03} coefficients (e.g., CHS-BDI). To permit calculation of predicted values, a term representing the main effect for each measure of adjustment, γ_{02} (e.g., BDI), was also included in each model; however, these main effects are not the focus of this paper and are not discussed.