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Attributional Style, Depression, and Loneliness: A Cross-Cultural Comparison of American and Chinese Students

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Completing measures of attributional style, depression, and loneliness were 198 college students from the East China Normal Universiy in Shanghai, China, and 193 partictpants from the University of Missouri at Columbia. Students from China accepted more responsibility for interpersonal and noninterpersonal failures than did U.S. students. They also took less credit for interpersonal success than did U.S. students. These relatively maladaptive attributional styles by Chinese students accounted for much of their relatively higher scores on depression and loneliness. The sample differences in attributional style fit well with previous research showing that the United States is a relatively more independent culture and that China is a relatively more interdependent culture. Finally, the observed relations between attributional style and depression and loneliness were very similar across these two samples, perhaps reflecting cross-cultural generality of fundamental human needs for feeling efficacious Implications for attribution theories and models of cross-cultural differences were discussed.

Maladaptive attributional styles contribute to the development and maintenance of depression, shyness, and loneliness (Dill & Anderson, 1999). Attributional style (or explanatory style) refers to the characteristic way that a person explains personally relevant events. For instance, some people usually attribute their occasional achievement failures to use of a poor strategy, whereas others usually attribute such failures to lack of ability. Theoretically, attributional styles differ in adaptiveness because of their impact on subsequent success expectancies, motivation, affect, and behavior (Anderson, 1983; Anderson, Horowitz, & French, 1983).

Most attributional style research has focussed on its relation to depression and related motivational problems and has been conducted primarily on participants from Western cultures. In general, these studies find that a maladaptive (or pessimistic) attributional style consists of attributing bad outcomes to internal, stable, global, and uncontrollable causes (self-blame) and good outcomes to external, unstable, specific, and uncontrollable causes (e.g., Alfano, Joiner, & Perry, 1994; Anderson & Arnoult, 1985b; Anderson & Riger, 1991; Friedlander, Traylor, & Weiss, 1987). This style has been found in children (e.g., Blumberg & Izard, 1985; Nolen-Hoeksema, Girgus, & Seligman, 1992), college students (e.g., Anderson, Jennings, & Arnoult, 1988; Seligman, Abramson, Semmel, & von Baeyer, 1979), noncollege student adults (e.g., Sujan, 1986), and psychiatric patients of mixed ages (e.g., Eaves & Rush, 1984; Rapps, Peterson, Reinhard, Abramson, & Seligman, 1982). Also, the maladaptive style is associated specifically with depressive disorders and not with schizophrenic (Rapps et al., 1982; Silverman & Peterson, 1993) or with nondepressed medical patients (Rapps et al., 1982).

The loneliness and attributional style literature is considerably smaller. Nonetheless, it is especially interesting to consider it from a cross-cultural perspective. Loneliness can be seen as a subtype of depression (e.g., Horowitz, French, & Anderson, 1982). The main difference is that loneliness is primarily a social problem, whereas depression can be primarily nonsocial or a mixture of social and nonsocial. Therefore, attributional style effects

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on loneliness are typically more specific to social events than are attributional style effects on depression. Replicating this pattern of findings across cultures would add strength to the claim that attributional style effects are basic aspects of human nature rather than culture-specific phenomena.

CULTURE AND DEVELOPMENT OF SELF-VIEWS

The vast majority of studies of attributional style have been conducted on subject populations that may best be characterized as having an independent (or individualistic) cultural orientation. To what extent are the main findings and theories involving attributional style limited to this cultural orientation?

Markus and Kitayama (1991) noted that cultures differ in two tasks in everyday life: independence and interdependence. Independence refers to tasks related to agency and autonomy, whereas interdependence refers to tasks related to communion and affiliation. In independent cultures, such as in the United States, Canada, and Western Europe, an independent construal of self is dominant. This independent construal is characterized by an autonomous and bounded sense of self relatively distinct from others and the environment. In interdependent cultures, usually identified as Asian as well as many Latin American, African, and Southern European cultures, an interdependent construal of self is dominant. There is a much greater emphasis on the interrelatedness of the individual to others and the environment. The self is meaningful only (or primarily) in the context of social relationships, duties, and roles.'

A potential link between these different self-views and the attribution literature concerns the differences in personal agency. Specifically, independent cultures foster a view of self that is very much based on control or efficacy. A positive self-view in such cultures requires the self to be seen as effective and in control. It may be no accident that adaptive attributional styles discovered in studies of independent cultures are those that promote this self-view, whereas maladaptive attributional styles are those that contradict this self-view. Is it possible that different cultures produce markedly different attributional patterns?

Culture-Based Attribution Preferences

Cultural differences in self-concepts may well be an important determinant of attributional phenomena in three very different ways. First, there may be cultural differences in the kinds of attributions generally used. For instance, there is evidence that people from independent cultures more frequently use dispositional attributions, whereas people from interdependent cultures more frequently use situational attributions (Lee, Hallahan, & Herzog, 1996; Miller, 1984; Morris & Peng, 1994; see Smith & Bond, 1993 for a review). However, there are also contradictory results in this domain (e.g., Morris & Peng, 1994; Si, Rethorst, & Willimczik, 1995).

Second, there may be cultural differences in what constitutes adaptive and maladaptive attributional styles. For example, attributing occasional achievement failures to other external circumstances may be somewhat maladaptive in interdependent cultures because such attributions may threaten perceptions of and ties to self-relevant groups. If the adaptiveness of the same attributional styles differ in different cultures, they would appear as culture by attribution interactions in studies with key criterion variables (i.e., depression or loneliness). The little work that has been published on this question provides mixed results (Crittenden & Lamug, 1988).

Third, the emphasis of interdependent cultures on the group might heighten the importance of attributional styles when assessed for interpersonal situations. The link between interpersonal events, attributional styles, and depression and loneliness may be relatively strong for people from interdependent cultures when compared to people from independent cultures. Because of its more interpersonal nature, loneliness is a particularly interesting problem to investigate in this regard.

Dispositional-Situational Shortcomings

One problem with some past research on attributions in different cultures is that the simple dispositional-situational dimension does not distinguish between success and failure outcomes, between interpersonal and achievement settings, or between very different types of internal (dispositional) causes. The meaning of a self-proclaimed dispositional attribution depends not only on the cultural milieu but also on precisely what type of dispositional cause is invoked (e.g., ability vs. effort) and whether it is being used to explain a successful exam performance, a failed attempt to organize a social event, or other combinations of outcome and event type.

Consider the meaning and fit of ability attributions by people who differ in their primary construal of self along the independent-interdependent dimension. The former view the self as autonomous, effective agents, whereas the latter place the self in a broader social context. Attributing failure to one's lack of ability contradicts the independent, autonomous, effective agent view of self. However, denying that one's own lack of ability contributed to failure contradicts the interdependent, group-oriented view of self. Thus, we might expect relatively more ability attributions for failure by interdependent culture participants than by independent culture participants. This pattern could emerge from both cognitive and motivational factors that are part of general explanation processes (Anderson, Krull, & Weiner, 1996). Interestingly, cultural effects on ability attributions for success add a bit more complexity. Specifically, the fit of ability attributions would seem

to differ for interpersonal and achievement successes. The interdependent cultural emphasis on self in group might well make ability attributions for interpersonal successes seem improper or boastful, whereas such attributions for noninterpersonal achievements would seem relatively more acceptable. The independent cultural emphasis on autonomy and efficacy allows ability attributions to be acceptable for both interpersonal and noninterpersonal successes.

Attributional Style and Problems in Living

Differences between cultures. Just as the fit between a specific event (e.g., interpersonal failure) and a specific attribution (e.g., ability) may vary between independent and interdependent cultures, the effect of a specific attribution on the person's affective and motivational state may also differ. For example, the Chinese emphasis on effort as the primary determinant of achievement outcomes (e.g., Hess, Chih-Mei, & McDevitt, 1987) suggests that the relation between depression and individual differences in the frequency of effort attributions for achievement outcomes should be especially pronounced for Chinese students relative to U.S. students, More broadly, it may be that a maladaptive attributional style in one culture may not be maladaptive in another.

Similarities across cultures. However, there are bound to be similarities across cultures, presumedly due to universals in the human condition. In previous work (e.g., Anderson & Deuser, 1993), my students and I proposed an attributional functionalism approach that analyzes the functions of different types of attributions. We suggested that "why" questions serve at least two different functions. The first is to give us information about the future controllability of events similar to the present one that is being analyzed. People need to know whether they are likely to succeed or fail at similar tasks in the future. Answers to this part of the why question are constrained by reality regardless of cultural norms. In other words, it is functional to be able to judge with some accuracy whether one can influence or control similar future events regardless of cultural background. This function, then, seems to minimize cultural differences. The second function involves judging whether one is at fault for a failure event or is to be credited for a successful event. Such knowledge is important for public accountability reasons. But Western culture independents are primarily accountable to themselves, whereas Eastern culture interdependents are more accountable to their group. This function, then, may well create cultural differences in attributional styles.

In sum, attributional functionalism assumes that basic attribution and attributional processes arise from the human need to deal effectively with a complex environment. Thus, it predicts that there will be considerable (but not complete) similarity in the types of attributions people prefer across cultures. It also predicts that cross-cultural differences in attributional style will fit the different accountabilities of West and East. Finally, it predicts that the relation between attributional style and problems such as depression is likely to be very similar across cultures.

One set of studies has examined a similar question regarding cultural similarities versus differences in attribution-emotion effects. Stipek, Weiner, and Li (1989) explicitly examined a number of attribution-emotion linkages among students from China and compared them to linkages commonly found in U.S. student samples. Consistent with this "universals in the human condition" perspective, they found few cross-cultural differences in attribution-emotion linkages. Furthermore, they found "very little support for stereotypic characterizations of the Chinese as being particularly other oriented, or for the descriptions of Americans as being relatively more competitive and self-focused" (Stipek et al.,1989, p. 114).

Summary of Potential Cultural Effects

There are good reasons to expect people from independent and interdependent cultures to systematically differ in preferred attributions. However, the precise pattern of these differences is hard to predict and almost certainly is more complex than can be captured by the simple dispositional-situational dichotomy. One possible cultural effect on attribution preferences concerns the culture by event outcome interaction. Specifically, people from more interdependent cultures should make relatively more external attributions for success than will people from more independent cultures, whereas the reverse is likely to hold for failure.

However, although the relation between attributional style and attribution-related problems such as depression may differ somewhat as a function of culture, such differences are likely to be rare and of relatively small magnitude. Indeed, the Stipek et al. (1989) empirical work and the Anderson and Deuser (1993) theoretical conception of attributional functionalism both strongly suggest that the relations between attributional styles and depression (or loneliness) are likely to be highly similar across cultures. For both of these questions-one concerning the generally preferred types of attributions, the other concerning attributional style / depression relations-models emphasizing differences in self-construal between independent and interdependent cultures predict numerous cultural effects, whereas models emphasizing the similarity of meaning and function of attributions predict few cultural effects.

Inherent Difficulties

One inherent problem with cross-cultural studies of attributional style and problems such as depression and loneliness concerns the meaning of the measurement

instruments. As noted in the following methods section, great care was taken to ensure that the translations were accurate. But one can never be sure that participants from two different cultures will attach the same meaning or importance to the same item. Even subtle differences in meaning might produce substantial differences in results.

Furthermore, the measures used in this and most other studies were originally developed for a Western student population. Thus, the measures may not include all of the response options needed by non-western participants to answer accurately. For these reasons, it is important to interpret any obtained cultural effects on attributional style or on depression or loneliness with caution.

THE PRESENT STUDY

College students at two universities completed attributional style, depression, and loneliness measures. One sample was from an independent culture, whereas the other was from an interdependent culture. Attributions were assessed for hypothetical success and failure outcomes in interpersonal and noninterpersonal (achievement) settings. Three attribution questions were the main focus of study. First, cultural similarities and differences in the relative frequency of various types of attributions were assessed. Second, cultural effects on the attributional style / depression relation were assessed. Third, cultural effects on the attributional style / loneliness relation were assessed.

METHOD

Participants

Participants were 391 students who completed all attribution measures; 198 participants were from China and 193 were from the United States. The Chinese students were from East China Normal University in Shanghai, China. The U.S. students were from the University of Missouri at Columbia. Approximately 53% of the China sample and 61% of the U.S. sample were female. Earlier studies (Anderson et al., 1983, 1988) using this same attributional style assessment procedure with U.S. college students have not found significant gender differences. Preliminary analyses of the present data from Chinese participants also revealed no important gender effects. Therefore, gender was not included in the analyses reported in this article.

Questionnaires

Attributional style. The 20-item forced-choice Attributional Style Assessment Test (Anderson et al., 1983) consists of 5 interpersonal success, 5 interpersonal failure, 5 noninterpersonal success, and 5 noninterpersonal failure situations. For each situation, six potential causes of the outcome are listed. The participant's task is to imagine him- or herself in each situation and to select the cause that would most likely be true. The potential causes are as follows: ability, strategy, personality trait, effort, temporary mood state, and other external circumstances. For each type of situation, six scores are derived by counting the number of times each of the six potential causes was selected.

This forced-choice procedure has both advantages and disadvantages compared to the more frequently used open-response / rating procedures (Anderson et al., 1983, 1988). There are three main advantages to the forced-choice procedure. First, the researcher can limit the choices to attribution factors that are most relevant to the theoretical question at hand. Second, choosing a specific cause as an explanation for some event is more similar to how the attribution process naturally works (Anderson et al., 1996). Rating causes on dimensions such as stability, locus, controllability, and globality requires a dimensional (versus a categorical) type of thinking; such dimensional thinking appears to be relatively artificial in the attribution domain (Anderson, 1991; Anderson & Deuser, 1993). Third, the forced choice method takes considerably less time to complete yet yields reasonable sized correlations with other variables. These reasons, especially time limitations with the Chinese sample, led to selection of the forced-choice method. The major disadvantage of the forced choice procedure is that within a situation type (e.g., interpersonal failure), the attributional choices are not independent of one another. This must be kept in mind when considering specific data patterns.

Loneliness. The 20-item University of California Los Angeles (UCLA) Loneliness Scale (Russell, Peplau, & Cutrona, 1980) consists of self-relevant statements that respondents answer by rating the extent to which each one is true of them on a 4-point scale anchored by 1 *(not at all)* and 4 *(frequently).* Half of the items are worded so that high scores indicate a high level of loneliness. The other items are worded in the opposite direction such that reverse scoring is necessary. Each participant's ratings were averaged across the 20 items, so the possible range of scores was 1 to 4.

Depression. The 130 item short form of the Beck Depression Inventory (BDI) (Beck & Beck, 1972) consists of 13 sets of four self-relevant statements. In each set, the statements represent different levels of depression-related symptoms. Respondents are asked to select all statements that apply to them. The four statements are scored from 0 (indicating no depression) to 3 (highest level of depression). The highest scoring item within each set is used to sum across the 13 item sets, resulting in a possible range of 0 to 39.

Translations. The English versions of these questionnaires were first translated into Chinese by an individual experienced in English-to-Chinese translations. These were then back-translated by another experienced translator. Differences between the original English versions and the back-translated versions were discussed by the two translators and the author. Final changes to the translations were based on these discussions.

Procedure

The questionnaires were administered in large group sessions by researchers who were native speakers of the primary language of the participants. Informed consent was obtained prior to questionnaire administration.

RESULTS

The various attribution choices within a set of items (e.g., interpersonal failure items) are not independent because choosing one attribution precludes choosing a different one. For example, the results of analyses on frequency of ability attributions are not totally independent of results on frequency of effort attributions. As discussed earlier, this is the major drawback to using forced-choice procedures. All analyses were conducted on each attribution type separately. This interdependence among different attribution choices should be kept in mind when interpreting specific results.

Cultural Differences in Attribution Choices

When summed across the four situation types (so that the possible range was 0 to 20), ability was the most frequent attribution choice (M= 4.72). It was followed by effort (M = 4.35), strategy (M= 4.17), temporary mood state (M= 2.76), other external circumstances (M= 2.29), and personality traits (M= 1.65).

The analyses in this section examined the overall frequency of each of the six attribution choices as a function of source (China versus United States), item outcome (success versus failure), and item interpersonalness (interpersonal versus noninterpersonal). The latter two variables were within-subjects variables. Scores on this 2 x 2 breakdown of the 20 attributional style situations could range from 0 to 5.

Theoretically, cultural differences in attribution preferences are most likely to occur for the two most characterological attribution categories-ability and trait-when applied to failure situations. China participants were expected to accept more responsibility for failure outcomes than were U.S. participants, and therefore, they were expected to make more ability and trait attributions. Furthermore, there is reason to expect cultural differences to differ as a function of whether the situation is interpersonal or noninterpersonal. Of course, these effects might well show up as higher order interactions. More specific predictions were not made.

Ability. The ANOVA on frequency of ability attributions revealed significant main effects of source, outcome, and interpersonalness, Fs(l, 389) = 6.80, 6.05, and 97.68, ps < .0l, .02, and .000l, respectively. China participants made more ability attributions than did U.S. participants (Ms = 1.27 and 1.09, respectively). Success items yielded more ability attributions than did failure items (Ms = 1.25 and 1.10). Noninterpersonal items yielded more ability attributions than did interpersonal items (Ms = 1.42 and .94).

Two of the two-way interactions were also significant.[2] The outcome by source interaction resulted from a crossover pattern. China participants made relatively more ability attributions for failure than for success (Ms = 1.37 and 1.16), whereas U.S. participants had the opposite pattern (Ms = .83 and .34), F(1, 389) = 35.50, p < .000l. Both groups of participants made more ability attributions for noninterpersonal than for interpersonal items, but this difference was more pronounced for the China participants (China: Ms = 1.58 and .96; United States: Ms = 1.27 and .91), F(1, 389) = 6.92, p < .0l.

The three-way interaction, F(1, 389) = 4.00, p < .05, can be understood in several ways. Perhaps the simplest is to note that whereas China participants made more ability attributions than did U.S. participants for both types of failure, U.S. participants made more ability attributions for interpersonal success. The two groups of participants made essentially the same number of ability attributions for noninterpersonal successes. Figure 1 presents these effects.[3]

These results support the hypothesis that culture shapes how people explain events in their lives. The pattern of ability attributions, especially for failure situations, fits well with the differences between the two cultures in emphasis on accepting responsibility for bad outcomes. Furthermore, claiming that interpersonal successes are due to one's own ability would seem to violate group norms in interdependent cultures but not in independent cultures.

Effort. Both source and interpersonalness yielded significant main effects on frequency of effort attributions, Fs(1,389) = 61.32 and 48.78, respectively & < .000l. U.S. participants made more effort attributions than did participants from China (Ms = 1.34 and .84). Noninterpersonal items yielded more effort attributions than did interpersonal items (Ms = 1.26 and .92).

Two of the two-way interactions were also significant. Although both groups of participants made more effort attributions for noninterpersonal than for interpersonal items, this effect was stronger for U.S. participants (Ms = 1.61 and 1.06) than for China participants (Ms = 1.81 and

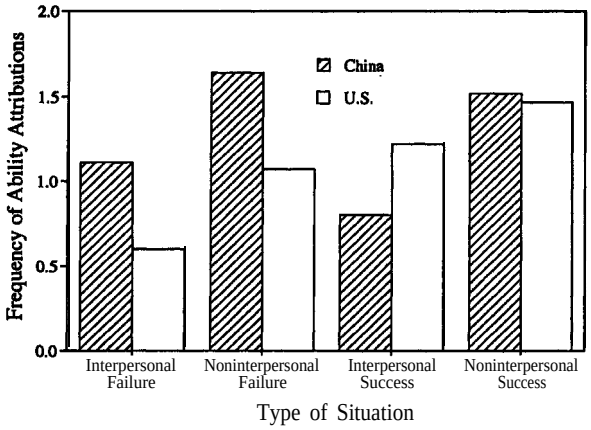

Figure 1 Frequency of ability attributions by China and U.S. college students as a function of type of situation.

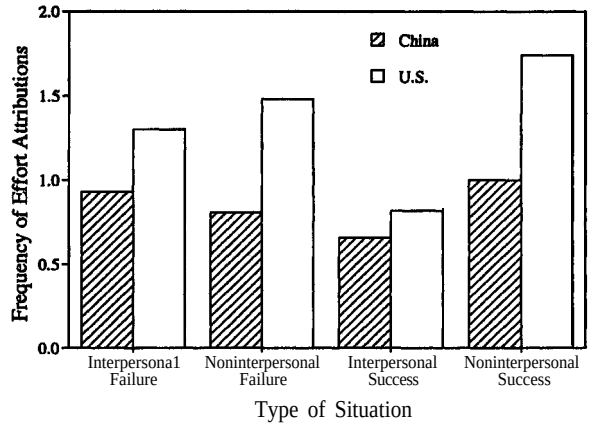

Figure 2 Frequency of effort attributions by China and U.S. college students as a function of type of situation.

1.59). This Source x Interpersonalness interaction was highly reliable, $F(1, 389) = 21.47$, $p < .0001$.

The Interpersonalness x Outcome interaction was also highly reliable, $F(1, 389) = 50.49$, $p < .0001$. It resulted from the fact that noninterpersonal success items yielded more effort attributions than did interpersonal successes (Ms = 1.37 and .74), but there was no real interpersonalness effect on failure items (Ms = 1.14 and 1.11). All of these effects can be seen in Figure 2. The three-way interaction was not significant, $F(1, 389) = 2.73$, $p > .09$.

Strategy. Strategy attributions yielded main effects of outcome and interpersonalness, $Fs(1, 389) = 6.16$ and 7.44, $ps < .02$ and .01, respectively. Failure items yielded more strategy attributions than did success items (Ms = 1.09 and .98). Noninterpersonal items yielded more strategy attributions than did interpersonal items (Ms = 1.10 and .97). In addition, the outcome by source interaction was significant, $F(1,389) = 4.62$, $p < .04$. This interaction revealed that the outcome effect was due almost exclusively to the U.S. participants (Ms = 1.19 and .99 for failure and success, respectively) rather than the China participants (Ms = .99 and .98).

The three-way interaction was also reliable, $F(1, 389) = 9.12$, $ps < .005$. Figure 3 presents these results. U.S. participants made relatively more strategy attributions than did China participants for all situations except interpersonal successes. These results are essentially opposite to the ability attribution results. It is interesting to note that for both the ability and strategy categories, the differences in attribution patterns between the two cultures is consistent across situation type except for interpersonal successes.

Temporary mood state. Mood attributions were significantly related to the interpersonalness of the situations, $Fs(1,389) = 175.57$, $p < .0001$. Interpersonal items yielded more mood attributions than did noninterpersonal items (Ms = .98 and .40).

Several interactions were also reliable. The outcome by source interaction displayed a crossover pattern. China participants made more mood attributions for success than failure (Ms = .86 and .63), whereas U.S. participants did the opposite (Ms = .58 and .69), $F(1, 389) = 17.52$, $p < .0001$. The Interpersonalness x Source interaction was also reliable, $F(1,389) = 6.48$, $p < .02$. Both groups of participants gave more mood attributions for interpersonal than for noninterpersonal items, but this effect was stronger for China participants (Ms = 1.10 and .40) than for U.S. participants (Ms = .87 and .40). Finally, the three way interaction was significant, $F(1, 389) = 4.86$, $p < .03$. As Figure 4 illustrates, interpersonal situations produced more mood attributions than did noninterpersonal situations. This effect was especially pronounced for the China participants when making attributions for interpersonal successes.

Other external circumstances. Three effects were significant in the analysis of other attributions. The outcome and interpersonalness main effects were both significant, as was the outcome by source interaction, $Fs(1, 389) = 25.60$, 36.86, and 12.54, respectively, $ps < .0005$. Figure 5 illustrates these effects.

Participants made more other external circumstances attributions for failure than for success situations (Ms = .68 and .46). Participants also made more other attributions for interpersonal situations than for noninterpersonal ones (Ms = .68 and .46). The Outcome x Source interac-

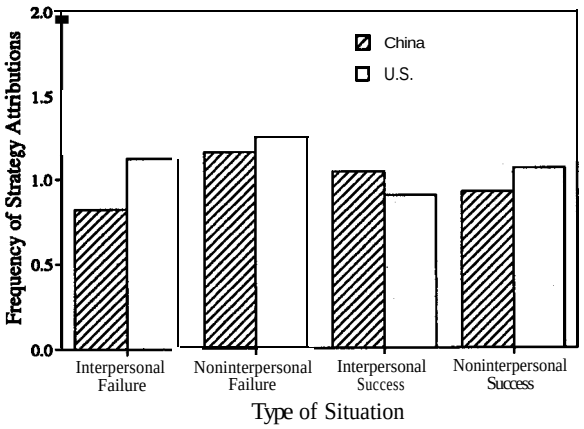

Figure 3 Frequency of strategy attributions by China and U.S. college students as a function of type of situation.

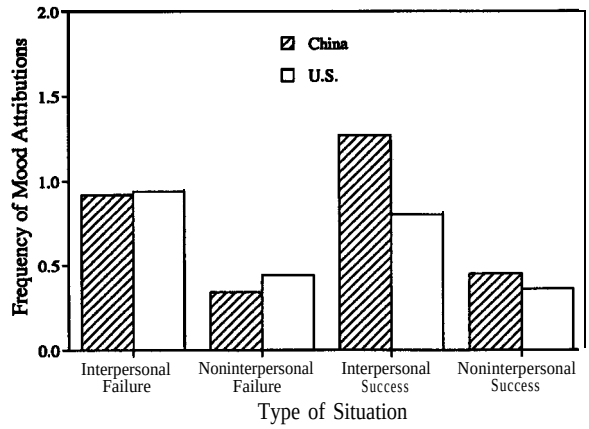

Figure 4 Frequency of mood attributions by China and U.S. college students as a function of type of situation.

tion revealed that outcome had a stronger effect on U.S. participants (Ms = . 74 and .35 for failure and success) than on China participants (Ms = .63 and .56).

Traits. The attribution category of personality traits was the least frequently chosen overall. However, the main effects of source, outcome, and interpersonalness were all significant. China participants made more trait attributions than did U.S. participants (Ms = .52 and .30), F(l, 389) = 39.47, p < .000l. Success situations yielded more trait attributions than failure ones (Ms = .52 and .31), F(l, 389) = 36.36, p < .000l. Interpersonal situations yielded more trait attributions than did noninterpersonal ones (Ms = .48 and .34), F(l, 389) = 17.43, p < .000l. Figure 6 displays these results.

There were also three significant interactions. The Outcome x Source interaction, F(1, 389) = 8.32, p< .005, resulted from a larger outcome effect on U.S. participants (Ms = .45 and .15 for success and failure) than on China participants (Ms = .58 and .47). The Interpersonalness x Source interaction, F(l, 389) = 64.75, p < .000l, resulted from a crossover pattern of means. U.S. participants made more trait attributions for interpersonal than for noninterpersonal situations (Ms = .50 and .09), whereas China participants produced the opposite pattern (Ms = .46 and .59)

Finally, the three-way interaction was again significant, F(l, 389) = 19.74, p< .000l. The most interesting aspect of the results in Figure 6 concerns the different patterns produced by China versus U.S. participants. China participants generated more trait attributions for all situation types except interpersonal successes, for which U.S. participants generated more trait attributions. This pattern is very similar to the ability attribution results and opposite to the strategy attribution pattern.

DISCUSSION OF THE CULTURAL DIFFERENCES

Generally, in Western (independent) cultures, attributing failures to ability and personality deficits and attributing successes to mood and other circumstances are considered maladaptive patterns likely to lead to increased depression and loneliness. According to this Western standard, participants from China compared to U.S. participants made more maladaptive attributions for all situation types except for noninterpersonal successes. For example, they more frequently chose ability and trait attributions for failures and less frequently chose ability and trait attributions for interpersonal successes than did U.S. participants. Various attributional theories and previous research on Western samples have shown that attributing failures to such stable, uncontrollable, internal causes is related to depression and loneliness (e.g., Anderson et al., 1988; Anderson, Miller, Riger, Dill, & Sedikides, 1994). One key question concerns whether the same patterns are adaptive or maladaptive in an Eastern (interdependent) culture.

The obtained cultural differences in general attribution patterns may be the result of several different processes. The traditional emphasis on the importance of interdependence found in Chinese culture may account (in part) for the relatively greater use of ability and trait attributions for failures by China participants. These individuals seem to be saying, "When I fail, it is because of something about me, not my group." U.S. participants, with their more independent cultural background, seem relatively

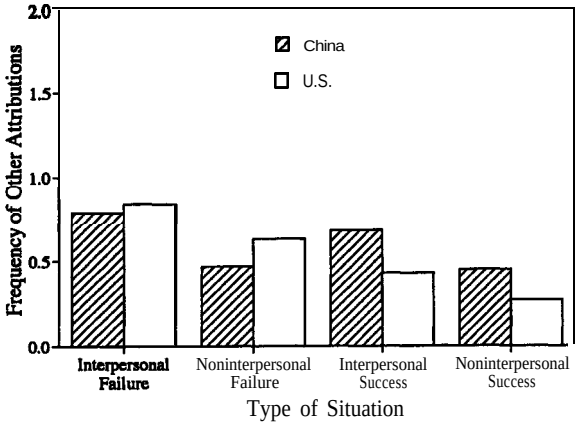

Figure 5 Frequency of other attributions by China and U.S. college students as a function of type of situation.

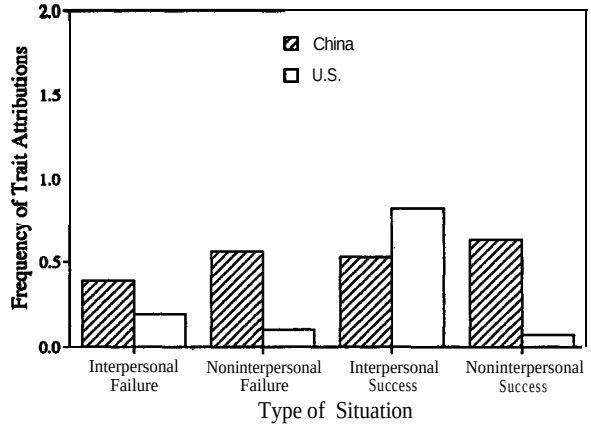

Figure 6 Frequency of trait attributions by China and U.S. college students as a function of type of situation.

more concerned about their self-view than about the view of their group.

The attribution patterns for success situations also are illuminating. U.S. participants were more likely than those from China to choose ability and trait explanations for interpersonal successes. Again, this is a motivationally adaptive pattern. Only in the case of noninterpersonal successes did participants from China display attribution patterns that were as adaptive (ability) or more adaptive (trait) than attribution patterns of U.S. participants.

DEPRESSION, LONELINESS, CULTURE, AND ATTRIBUTIONAL STYLE

As noted above, the general attributional patterns suggest that the China participants might well be experiencing more depression and loneliness than the U.S. participants. If so, the cultural differences in attributional style may at least partially account for such cultural differences in depression and loneliness. However, the differential emphasis on interdependence versus independence may also influence the adaptiveness of various attributional patterns. For instance, the slope relating frequency of ability attributions for failure to level of depression may differ for China versus U.S. participants. In studies of participants from independent cultures (which were conducted primarily in the United States), attributing failures to lack of ability is positively related to depression and loneliness. Could it be that the same attributional style is adaptive in interdependent cultures? If so, the slope relating ability attributions to depression (or loneliness) would be negative. Another possibility is that the slopes relating attributional styles to depression and loneliness may differ between the two types of cultures primarily in strength but not direction.

In sum, if the relations between attributional style and depression and loneliness are the same regardless of cultural background and if the measuring instruments actually assess the same constructs in both samples, then we should find (a) greater depression and loneliness in the China sample than in the U.S. sample, (b) a reduction in these differences when attributional style is statistically equated between the two samples, and (c) few (if any) Source x Attributional Style interactions in regression models predicting depression and loneliness.

Depression Results

Eight of the China and 2 of the U.S. participants had incomplete data on the depression measure. This reduced the sample size to 190 from China and 191 from the U.S. Scores on the 13-item Beck Depression Inventory (BDI) were internally consistent; coefficient alpha was 0.87

Table 1 presents the distributional properties of the depression scores for the two samples. As can be seen in Table 1, both samples contained people with a wide range of depression scores. In addition, the China sample reported higher levels of depression than did the U.S. sample (later sections present statistical tests of this). Beck and Beck (1972) provided the following descriptive labels for degree of depression on this 13-item version of the BDI: 0 to 4, none or minimal; 5 to 7, mild; 8 to 15, moderate; 16 and higher, severe. Using these cutoffs, we can see that more than 1O% of the China participants would be classified as severely depressed; less than 5% of the U.S. sample would receive this same classification. However,

more than 1O% of the U.S. sample would be classified as at least moderately depressed. Two points need to be kept in mind concerning the depression measure. First, whether the Chinese version of the depression measure actually captures depression in the same way that the English version does is not easily answered. Second, a high score on the BDI is not equivalent to a clinical diagnosis of depression in either culture.

Regression analyses were used to examine the effects of source (China versus U.S.) and attributional style on depression. Attributional style consisted of the participants' scores on each of the four situation types (Outcome x Interpersonal / Noninterpersonal). For example, ability attributional styles consisted of the number of ability choices made for interpersonal failures, noninterpersonal failures, interpersonal successes, and noninterpersonal successes. Because there were five items of each type, attributional style scores could range from 0 to 5. These scores were centered to reduce collinearity among the predictors.

All main effects and interactions among these five predictors were included in the initial model. Therefore, the initial model included five main effects, 10 two-way interactions, 10 three-way interactions, five four-way interactions, and one five-way interaction. I first examined the five-way interaction from this full model. Next, I dropped the five-way interaction term and tested the four-way interactions as a set. If this omnibus test was significant (at $p < .0l$), I then examined each four-way term separately. This was done to reduce the Type I error rate created by the large number of interaction tests. This same procedure was performed on the three-way and two-way interactions. Finally, the main effects were examined without any interaction terms in the model.

Interpretational notes. Differences between the two samples in general level of depression can be examined in three somewhat different ways with slightly different meaning. First, we can test the simple proposition that the China participants would report higher levels of depression than the U.S. participants. This prediction, derived from the attribution patterns described earlier, was confirmed by the results of a simple t test. China participants were more depressed (M= 8.01) than were the U.S. participants (M= 4.40), $t(379) = 6.27$, $p < .0l$. This test does not adjust the depression means for sample differences in attributions.

The second way to examine source effects on depression is within the regression analyses described above and reported in the following sections. The source main effect on depression level is examined with the four attributional style main effect variables in the model (e.g., ability attribution scores for each of the four types of situations) and therefore statistically equated. Significant source main effects in these subsequent regressions would indicate that the two sample depression means were different even after adjusting for group differences in that type of attribution.

TABLE 1: Descriptive Statistics on the China and U.S. Samples

	China		*United States*	
	Depression	*Loneliness*	*Depression*	*Loneliness*
Maximum	**36**	**3.75**	**27**	**3.65**
90th percentile	**18**	**2.70**	**9**	**2.40**
75thpercentile	**11**	**2.40**	**6**	**1.95**
Median	**6**	**1.95**	**4**	**1.65**
25th percentile	**3**	**1.60**	1	**1.35**
10thpercentile	1	**1.35**	**0**	**1.25**
Minimum	**0**	**1.10**	**0**	**1.00**

The third way to examine source effects on depression is an expanded version of the regression analyses just described. Specifically, instead of adjusting attributional style main effect variables four at a time (that is, each of the six attribution types separately), we can instead include all of the attributional style types simultaneously. This third approach is reported at the end of the regression analysis section. Both of these latter two types of analyses test a mediation model in which depression differences between China and U.S. participants are mediated by attributional style differences.

Perhaps the most interesting set of tests involve interactions between source and attributional style. Any such interactions indicate that the relation (i.e., the slope) between attributional style and depression differs for participants from the two different cultures. In other words, source by attributional style interactions are expected if the cultures differ in what constitutes maladaptive attributional styles. Note that the full model includes 31 terms (Source x Interpersonal Failure Style x Noninterpersonal Failure Style x Interpersonal Success Style x Noninterpersonal Success Style); 15 of these are Source x Attributional Style interactions. Each of these analyses was carried out separately for each of the six attribution types (ability, effort, etc.). Thus, across the six attribution types there were 90 interactions (15 x 6) involving source.

Ability attributions. The regression analyses on ability attributions revealed no evidence of three-way, four-way, or five-way interactions. However, the omnibus test of the two-way interactions was significant, $F(10, 365) = 3.03$, $p < .0l$. A closer look at these interactions revealed that both the noninterpersonal failure by noninterpersonal success and the source by noninterpersonal success interactions were individually significant, $Fs(1,365) = 5.29$ and 16.98, $ps < .03$ and .000l, respectively. The main effects of source and noninterpersonal success were also significant, $Fs(1, 375) = 32.21$ and 8.57, respectively, $ps < .005$. Figure 7 displays all of these results.[4]

Panel A of Figure 7 illustrates the noninterpersonal success main effect and the Noninterpersonal Failure x Noninterpersonal Success interaction. The main effect of ability attributions for noninterpersonal success on depression is shown by the negative slopes of both lines in Panel A. Participants who made relatively more ability attributions for noninterpersonal successes reported less depression. However, this effect was most pronounced for participants who also made relatively few ability attributions for noninterpersonal failures. The difference in slopes in Panel A is the two-way interaction. In short, the effect on ability attributions for noninterpersonal success on depression was different as a function of ability attributions for noninterpersonal failures.

Panel B reveals that participants from China reported higher depression levels on average than did U.S. participants. Conceptually, this main effect of source is the difference between the intercepts of the two lines in Panel B. Furthermore, this source effect occurred primarily among participants who made relatively few ability attributions for noninterpersonal successes, which is the Source x Noninterpersonal Success interaction.

The interpersonal success main effect also approached significance, F(1, 375) = 3.61, p< .06. This effect was similar in form to the noninterpersonal success main effect in that both were negatively related to depression. The slope relating frequency of ability attributions for interpersonal successes to depression was -.48, indicating that participants who made relatively more ability attributions for interpersonal successes tended to be less depressed.

These results are somewhat mixed, at least concerning the cultural specificity hypothesis. That there was one Source x Attributional style interaction suggests that what is an adaptive pattern of attributions may differ between cultures. However, only 1 of 15 possible such interactions proved reliable, suggesting considerable generality of attributional style / depression effects across these two cultures.

Effort attributions. The regression analyses revealed no evidence of two-way, three-way, four-way, or five-way interactions. Only the main effect of source was significant, F(1, 375) = 36.46, p < .000l. Adjusted means again revealed that the China participants were more depressed (M= 8.10) than the U.S. participants (M= 4.31). The lack of Source x Attributional Style effects again suggests considerable generality of attributional style / depression effects. But the lack of any significant effort attributional style effects also suggests caution on this point.

Strategy attributions. As with effort, the analysis of strategy attributions revealed no evidence of reliable interactions. Two of the main effects were significant. The source main effect again revealed that the China participants (adjusted M= 8.04) were more depressed than the

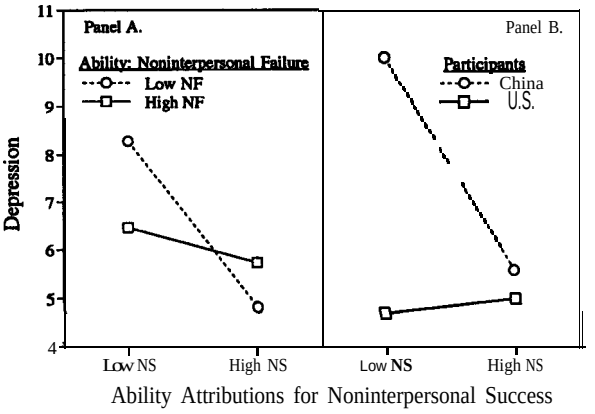

Figure 7 Depression as a function of ability attributions for noninterpersonal success and failure (Panel A) and as a function of source (Panel B).

U.S. participants (adjusted M= 4.37), F(1, 375) = 40.08, p < .000l. The noninterpersonal failure main effect was also significant, F(1, 375) = 4.50, p < .04. The slope relating frequency of strategy attributions for noninterpersonal failures to depression (*b*= -.61) revealed that participants who made relatively more such attributions were less depressed. In other words, attributing noninterpersonal failures to use of an ineffective strategy was associated with lower depression for U.S. and China participants alike.

Temporary mood state attributions. Initial analyses yielded no evidence of reliable two-way, four-way, or five-way interactions. The omnibus test of the three-way interactions was significant, F(l0, 355) = 3.41, p < .0l. Closer examination of the individual interactions revealed that 2 of the 10 three-way interactions were significant. In addition, the source and the noninterpersonal success main effects were significant, Fs(l, 375) = 32.94 and 9.13, respectively, ps < .003.

One significant three-way interaction was the interpersonal failure by noninterpersonal failure by noninterpersonal success interaction, F(l, 355) = 707, p < .009. Figure 8 displays this interaction as well as the noninterpersonal success main effect. It can be seen that in general participants who made relatively frequent mood attributions for noninterpersonal successes were more depressed; the average slope of the four lines is clearly positive. However, the three-way interaction was occasioned by the flat noninterpersonal success effect on depression for participants who made few mood attributions for both interpersonal and noninterpersonal failures.

The other three-way interaction was the source by interpersonal success by noninterpersonal success interaction, F(l, 355) = 7.71, p < .006. Figure 9 displays this

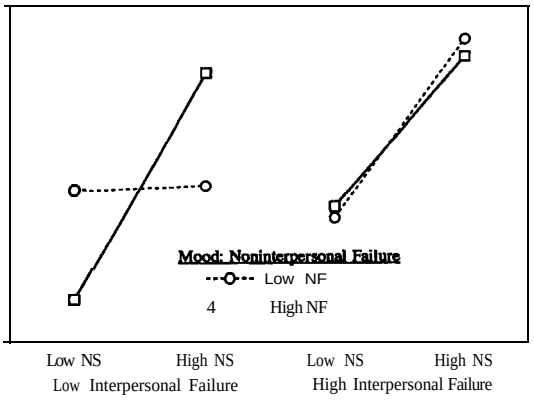

Figure 8 Depression as a function of mood attributions for noninterpersonal failure and success and interpersonal success.

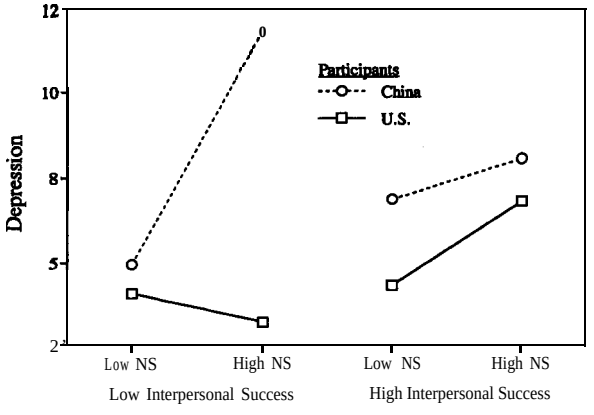

Figure 9 Depression as a function of mood attributions for noninterpersonal success, interpersonal success, and source of participants.

effect and also illustrates the source main effect. Basically, there was a positive relation between frequency of mood attributions for noninterpersonal success and depression, except for those U.S. participants who also made relatively few mood attributions for interpersonal success.

Another way of thinking about this interaction is to note that for participants who make relatively frequent use of mood attributions for interpersonal successes, the effect of mood attributions for noninterpersonal successes on depression is quite similar for U.S. and China participants. However, the effect of mood attributions for noninterpersonal successes is dramatically different for those China and U.S. participants who also make few mood attributions for interpersonal successes. This latter finding again suggests some cultural specificity in the attributional style / depression relation.

Other external circumstances attributions. Initial analyses suggested that none of the two-way, three-way, four-way, or five-way interactions involving attributions to other circumstances were reliable. There were three significant main effects. The source main effect revealed higher levels of depression in participants from China (adjusted M= 770) than in participants from the United States (adjusted M= **4.71**), F(l, 375) = 2736, p< .000l. The main effect of other attributions for interpersonal failures revealed a negative relation (*b* = -. 726), F(1, 375) = 7.22, p < .008. People who more frequently blamed interpersonal failures on other circumstances were less depressed. The main effect of other attributions for noninterpersonal successes revealed a positive relation (*b* = 1.78), F(l, 375) = 16.90, p < .000l. People who more frequently attributed noninterpersonal successes to other circumstances were more depressed. The lack of Source x Attributional Style interactions suggests that the relation between other attributions and depression is essentially the same for both cultures.

Traits. Initial analyses of frequency of trait attributions yielded no evidence of reliable three-way, four-way, or five-way interactions. However, the omnibus test of the two-way interactions was significant, F(10, 365) = 2.48, p< .0l. Closer inspection revealed that the interpersonal failure by interpersonal success and the noninterpersonal failure by interpersonal success interactions were significant, Fs(l, 365) = 7.89 and 10.79, respectively, ps < .0l. Figure 10 illustrates these results.

Panel A illustrates the first of these interactions. Blaming interpersonal failures on one's own personality traits while avoiding trait attributions for interpersonal successes is especially problematic, leading to relatively high depression scores. The main effect of trait attributions for interpersonal failures can also be seen in Panel A, F(1, 365) = 9.51, p< .003. Generally, people who made more trait attributions for interpersonal failures were more depressed.

Panel B illustrates the finding that blaming noninterpersonal failures on one's own personality traits is especially damaging to one's depression level for people who also frequently make trait attributions for interpersonal successes. The main effect of trait attributions for noninterpersonal failures can also be seen in Panel B, F(l, 365) = 18.92, p < .000l. People who made more trait attributions for noninterpersonal failures were more depressed.

Finally, the source main effect was again highly significant, F(l, 365) = 14.19, p < .00l. Participants from China had higher adjusted mean depression scores than

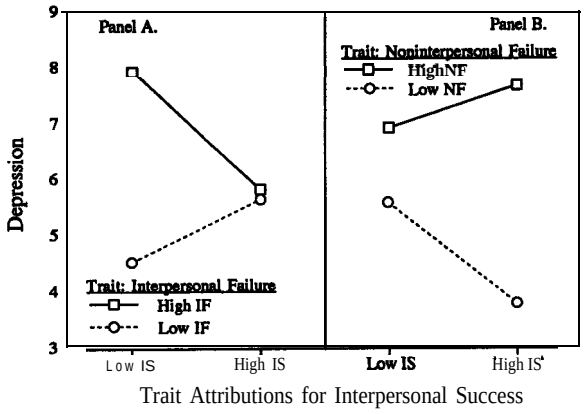

Figure 10 Depression as a function of trait attributions for interpersonal success and failure (Panel A) and for interpersonal success and noninterpersonal failure (Panel B).

did those from the United States (Ms = 7.42 and 4.99, respectively).

None of the Source x Attributional Style interactions were significant. This indicates that the trait attributional style / depression relation was essentially the same across the two participant groups.

Attributional style as a mediator of depression. For each of the six types of attributions, China participants had higher depression scores than did U.S. participants even after statistically controlling for attributional style differences. However, the magnitude of this source effect was somewhat smaller after the adjustments for differences in attributional style, suggesting that attributional style served as a (partial) mediator of source effects on depression. To explore this possibility more fully, additional regression analyses were conducted in which attributional style differences were more thoroughly controlled.

As Baron and Kenny (1986) noted, a mediation model is supported when the following three conditions are all met: (a) the independent variable (IV-participant source: China vs. U.S.) is significantly related to the mediating variable (MV-attributional style), (b) the IV is significantly related to the dependent variable (DV-depression), and (c) the MV is significantly related to the DV when the IV is also a predictor in the statistical model. When these three criteria are met, the percentage variance in the DV accounted for by the IV is necessarily smaller when the model has the MV in the model.

The first set of analyses in this article, in which frequency of various attribution types were found to differ between China and U.S. participants, establishes the first condition of the mediation model. Participant source was related to attributional style.

To test the second condition of the mediation model, the percentage of variance in depression accounted for by participant source (China, United States) was calculated without any attributional style correction. In other words, the portion of variance in depression scores that was unique to source as well as that portion shared by source and attributional style was included with the source effect. As can be seen in Table 2, this amounted to about 9% of the variance in depression and was a highly significant effect, $F(1, 379) = 39.31$, $p < .001$. 5 Although not directly relevant to the mediation analysis, a similar baseline comparison of the total variance in depression scores accounted for by the 24 attributional style terms (6 attribution types x 4 situation types) yielded an estimate of 27%, which was also highly significant, $F(24, 356) = 5.39$, $p < .001$.

The third and final condition of mediation was tested by examining the portion of variance in depression that was uniquely associated with attributional style. It amounted to about 19% and was highly significant, $F(24, 355) = 3.97$, $p < .001$. Table 2 also reveals that the source effect was reduced to about 2% when only unique variance was counted. Thus, these data provide good evidence that the difference in depression between the China and U.S. samples was at least partially due to the more maladaptive attributional styles of the China sample, uncovered in the attributional patterns analyses.

One potential problem with including all 24 attributional style terms is that they are not independent. Once we know how many ability, effort, strategy, mood, and other circumstances attributions a person has made for interpersonal failures, we also know how many trait attributions he or she made for interpersonal failures. As discussed earlier, this is one disadvantage of the forced-choice methodology. To see whether the mediation picture changes if this problem is taken into account, additional regressions were run that included only 20 of the 24 attributional style terms. Specifically, one regression model deleted the four ability attributional style scores, another deleted the 4 effort attributional style scores, and so on. The unique variance associated with participant source and with attributional style from these analyses are also reported in Table 2. As can be seen, the results were essentially the same. Source effects on depression were considerably smaller when attributional styles were corrected (approximately 2%) than when uncorrected (9%).

One might also wonder about the possibility of mediated moderation (e.g., Baron & Kenny, 1986), which would require testing additional regression models that include the interaction terms. The relative paucity of significant source by attributional style interactions found in the main attributional style analyses suggests little mediated moderation. Furthermore, the large number of such interaction terms and the statistical independence diffi-

TABLE 2: Percentage of Variance in Depression and Loneliness Explained by Source (S) and Attributional Style (AS) in Various Regression Models

	Number of Attributional Style Terms (Deleted AS Terms)															
	None		*24 AS Terms (All)*		*20 AS Terms (Without Trait)*		*20 AS Terms (Without Mood)*		*20 AS Terms (Without Other)*		*20 AS Terms (Without Effort)*		*20 AS Terms (Without Strategy)*		*20 AS Terms (Without Ability)*	
Criterion	*S*	*AS*	*S*	*AS*	*S*	*AS*	*S*	*AS*	*S*	*AS*	*S*	*AS*	*S*	*AS*	*S*	*AS*
Depression	9	34	2	27	2	26	2	26	2	19	2	19	2	19	2	19
Loneliness	8	28	1[a]	21	1	21	1[a]	20	1	20	1	20	1	20	1[a]	21

culties created by the forced-choice methodology make additional analyses of relatively little value in the present study. Therefore, they are not reported in this article.

Discussion of the Depression Results

Overall, there were few cultural differences in the relations between attributional style and depression. The two significant interactions involving culture-ability and mood-both involved attributions for noninterpersonal (achievement) success situations. In both cases, the relation between the attributional style measure for noninterpersonal success and depression was quite strong for China participants and essentially flat for U.S. participants. For China participants, making few ability attributions for noninterpersonal success events led to higher depression levels; making relatively many mood attributions for these same noninterpersonal successes also predicted relatively high depression levels (but only when participants also made relatively few mood attributions for interpersonal success).

There are a couple of plausible explanations for these cultural differences in the relation between attributional style and depression. The simplest explanation is that these results reflect the relative importance of performing well on achievement tasks. Noninterpersonal achievement may be much more important for the Chinese college students than for the American ones. Alternatively, these cultural differences may be the result of the fact that for the China participants, noninterpersonal (achievement) tasks are the only situations in which apparently self-serving attributions are acceptable. Those who cannot accept the credit for such successes (via an ability attribution) and who instead assign these successes to the unstable and uncontrollable factor of mood state may be particularly susceptible to depression.

In general, however, most of the depression/attributional style results were similar across the two participant populations and were similar to what one would expect from current theory. For example, participants who made relatively frequent strategy attributions for noninterpersonal failures were relatively less depressed than were those who made few such controllable strategy attributions.

LONELINESS, CULTURE, AND ATTRIBUTIONAL STYLE

Recall that loneliness was included in this study to further test the generality of attributional style findings found with Western samples. Loneliness is a subtype of depression that is more restricted to interpersonal problems. The greater emphasis placed on the social group by interdependent cultures should allow cultural differences in attributional style links to loneliness to emerge. Alternatively, the attributional style/loneliness relations found in Westem samples may not be greatly different from those in Eastern samples.

Loneliness Results

Two of the China participants had incomplete data on the loneliness measure. This resulted in sample sizes of 196 from China and 193 from the United States. Scores on the 20-item UCLA Loneliness Scale were internally consistent; the coefficient alpha was .91. Previous research on attributional correlates of loneliness have found that attributional styles for interpersonal situations are more highly related to loneliness than are attributional styles for noninterpersonal situations (e.g., Anderson et al., 1983, 1988). This makes sense given the fact that loneliness is primarily an interpersonal problem in living (e.g., Dill & Anderson, 1999; Horowitz et al., 1982).

As expected from the attributional style differences between the China and U.S. participants, those from China also were more lonely (Ms = 2.01 and 1.72), $t(387) = 5.73$, $p < .0001$. This parallels the finding of different levels of depression. As noted in the depression analyses, this approach does not adjust for group differences in attributional style. Analyses that do make this adjustment are reported in the following sections.

The same multiple step regression approach was used to analyze the effects of five independent variables on the relation between frequency of each type of attribution and loneliness: source (China vs. U.S.) and the four situation types (interpersonal success, interpersonal failure, noninterpersonal success, and noninterpersonal failure). Interestingly, none of the two-, three-, four-, or five-way interactions reached statistical significance. Thus, there is no evidence that the attributional style/loneliness relation is any different between the two cultures sampled.

Ability attributions. The regression analyses on ability attributions revealed that the main effects of source, interpersonal failure, and interpersonal success were significant, Fs(1,383) = 14.83, 15.87, and 19.05, respectively, all ps < .000l. As expected, the frequency of ability attributions for interpersonal failures was positively related to loneliness *(b* = .094). Also as expected, the frequency of ability attributions for interpersonal successes was negatively related to loneliness *(b* = -.094). Finally, the source main effect revealed that China participants reported higher levels of loneliness than did U.S. participants even after adjusting for differences in frequency of ability attributions in the four situation types (adjusted Ms = 1.97 and 1.77, respectively).

Effort attributions. The only reliable effect of the effort analyses was the source main effect. China participants reported higher levels of loneliness than did U.S. participants even after adjusting for differences in frequency of effort attributions in the four situation types, F(1, 383) = 28.65, p< .000l (adjusted Ms = 2.02 and 1.72, respectively).

Strategy attributions. As with the effort analyses, the only reliable effect to emerge from the strategy analyses was the source main effect. China participants reported higher levels of loneliness than did U.S. participants even after adjusting for differences in frequency of strategy attributions in the four situation types, F(l, 383) = 27.15,p< .000l (adjusted Ms = 2.00 and 1.73, respectively).

Temporary mood state attribution. Regression analyses of frequency of mood attributions yielded two significant effects. Frequency of mood attributions for interpersonal success attributions was positively related to loneliness, F(l, 383) = 15.54, p<.000l, *b*= .096. Furthermore, China participants reported higher levels of loneliness than did U.S. participants even after adjusting for differences in frequency of mood attributions in the four situation types, F(1, 383) = 21.40, p< .000l (adjusted Ms = 1.99 and 1.75, respectively).

Other external circumstances attributions. Analyses of effects of other attributions on loneliness yielded significant main effects of source, interpersonal failure, and interpersonal success, Fs(l, 383) = 25.45, 25.00, and 13.76, respectively, all ps < .00l. Consistent with past research, frequency of other attributions for interpersonal failures was negatively related to loneliness *(b* = -.118), whereas frequency of other attributions for interpersonal successes was positively related to loneliness *(b* = .108). The source effect was that China participants were more lonely (M= 1.99) than the U.S. participants (M= 1.74).

Trait attributions. Trait attributions yielded the same pattern as the ability attributions. The source, interpersonal failure, and the interpersonal success effects were significant, Fs(l,383) = 13.32, 23.24, and 12.75, respectively, ps< .00l. Frequency of trait attributions for interpersonal failures was positively related to loneliness *(b* = .206), whereas frequency of trait attributions for interpersonal success was negatively related to loneliness *(b* = -.098). The source main effect was the same as in all previous analyses: China participants reported more loneliness than did U.S. participants even after means were adjusted for differences in trait attributions (Ms = 1.97 and 1.77, respectively).

Attributional style as a mediator of loneliness. For each of the six types of attributions, China participants had higher loneliness scores than did U.S. participants even after statistically controlling for attributional style differences. As with the earlier depression analyses, additional mediation analyses on loneliness were conducted. As with depression, the first condition of mediation was confirmed by the initial analyses on differences in attributional styles produced by China and U.S. participants.

The second condition of mediation was tested by examining the percentage of variance in loneliness accounted for by participant source (China, U.S.) without any attributional style correction. Table 2 shows that this amounted to about 8%, a highly significant effect, F(l, 387) = 32.83, p < .00l. The total variance in loneliness scores accounted for by the 24 attributional style terms was about 28%, F(24, 364)= 5.89, p < .00l.

Finally, the third condition of mediation was met when the attributional style effect on loneliness remained significant with source added to the model, accounting for about 21% of the variance in loneliness, F(24, 363) = 4.40, p< .00l. In other words, differences in attributional styles by China versus U.S. participants at least partially mediated the source (cultural) effect on loneliness. Table 2 reveals that the source effect on loneliness was reduced to about 1% when the mediation variables (attributional style) were in the model.

Additional regressions were run which included only 20 of the 24 attributional style terms. In each of these six regressions, one attribution type was deleted from the model. The unique portion of variance in loneliness associated with participant source and with attributional style from these analyses are also reported in Table 2. As can be seen, the results were essentially the same. Source effects on loneliness were considerably smaller when attributional styles were corrected (approximately 1%) than when uncorrected (8%). In fact, the source effect on loneliness became nonsignificant by conventional statistical standards in the analyses that included all 24 attributional

style terms as well as in two of the reduced attributional style models (the ones without mood and ability attributions, respectively).

Discussion of the Loneliness Results

As noted at the beginning of this section, the regression analyses yielded no evidence of cultural differences in the relation between loneliness and attributional style. This is very similar to the depression results, in which only two attributional style / source interactions met the a priori alpha criteria of statistical significance. In both of those cases, the cultural differences involved attributions for noninterpersonal situations. Because loneliness is more narrowly restricted to problems in interpersonal situations, it is not surprising that those two cultural effects weakened to nonsignificance when loneliness was the criterion variable.

Along this same line of reasoning, it is important to note that the loneliness / attributional style correlations that did occur all involved interpersonal situations and were all in the theoretically expected direction. For instance, attributing interpersonal failures to ability and trait factors, both of which are relatively uncontrollable self blame factors, was associated with higher loneliness. Conversely, attributing interpersonal successes to ability and trait fators was associated with lower levels of loneliness.

Finally, the mediation analyses suggested that at least part of China / U.S. participants' differences in loneliness is due to the somewhat more maladaptive attributional style of China participants. Indeed, one could argue that the results displayed in Table 2 indicate that most or all of the source effect on loneliness is attributable to attributional style differences.

GENERAL DISCUSSION

Summary of Findings

This research began with the question of the cultural specificity of the attributional style fmdings that have emerged from countless studies conducted over the past 35 years on people from independent cultures. The first set of analyses-on cultural differences in attribution preferences-revealed two main findings. First, cultural differences emerged for all six types of attributions studied. These differences were generally congruent with expectations based on the independent-interdependent distinction drawn by Markus (and the individualism-collectivism distinction of, e.g., Triandis, 1990, 1994). Second, these differences did not easily map onto the simple dispositional-situational dichotomy frequently employed in the attribution literature. Indeed, the observed cultural differences in attributions would be inexplicable if we merely considered whether the attribution types were dispositional or situational.

The second set of analyses-on cultural differences in the attributional style / problems in living (depression and loneliness) relations-revealed four main findings. First, there were few cultural differences-2 out of a possible 180 interactions involving source. This suggests that the theoretical underpinnings of models of attribution and attributional effects, based primarily on subject populations from independent cultures, apply fairly generally across cultures. In other words, the differences in self between cultures may produce only relatively small changes in generally larger attribution effects. People need to feel personally efficacious to maintain an optimistic, nondepressed outlook. These findings are in complete accord with the attributional functionalism perspective, which maintains that the major features of attributions and of attributional processes serve the fundamental role of helping individuals to gain mastery or control over their environment (Anderson & Deuser, 1993). They are also in accord with other empirical work on the cross-cultural generality of attribution-emotion linkages (Stipek et al., 1989).

Second, the only two cultural differences that emerged are interpretable but do not necessarily require the independent-interdependent theoretical perspective. Both cultural differences in the attributional style / depression relation involved a strong relation between attributions for achievement events and depression among China participants and no relation among the U.S. participants. This could reflect either the relative importance placed on achievement in the two cultures or the fact that noninterpersonal success is the one domain in which taking personal credit is encouraged by interdependent cultures.

Third, the relatively higher levels of depression and loneliness reported by the China participants (relative to U.S. participants) are at least partially due to attributional style differences between the two samples. The mediation analyses of the source / depression and the source / loneliness effects yielded considerable support for attributional style serving as a mediating variable.

Fourth, the attributional style results support earlier work showing that loneliness is primarily a problem involving interpersonal issues, whereas depression involves both interpersonal and noninterpersonal issues. All of the statistically significant loneliness / attributional style effects involved interpersonal items. The significant depression / attribution style effects involved both interpersonal and noninterpersonal items.

Alternative Explanations

One study, of course, cannot conclusively rule out all alternative explanations. Interpretations of cross-cultural comparisons are particularly difficult. In the present research, for instance, the higher levels of depression and

loneliness among the China participants may reflect a generally greater-willingness to report negative personal and social feelings rather than a true difference in depression and loneliness. Similarly, the items and choices on the depression and loneliness scales may have different meanings for research participants from the two different cultures. Although it isimpossible to prove that the scales did in fact mean the same thing to the two samples, the procedure used for translating, back-translating, and revising the scales certainly reduces this potential problem. Yet a third variant on this theme involves the origin of the Attributional Style Assessment Test (Anderson et al., 1983), the BDI (Beck & Beck, 1972), and the UCLA Loneliness Scale (Russell et al., 1980). All were created to capture common experiences of U.S. adults. Therefore, they may not offer one or more kinds of attributions commonly used in other cultures or the kinds of items best suited to assess depression and loneliness.

Another common problem with cross-cultural work in general is that cultures differ in many ways. Therefore, it is impossible to rule out all alternative explanations for a particular set of findings. The differences in attribution preferences obtained in the present study are consistent with the theoretical independent-interdependent perspective on self-views but could be the result of other related cultural differences. However, most cross-cultural differences in attribution preferences that could have been obtained would have contradicted this self-view theoretical perspective. But the obtained attribution preferences did not contradict this perspective, suggesting that the study provided a legitimate test.

One additional problem also warrants attention. The present data are correlational, making causal direction statements risky. Depression might be causing the different attributional styles rather than vice versa. Or there might be a third variable artificially causing the obtained relations between attributional style and depression and loneliness. Two studies reported by Oettingen and Seligman (1990) lend some support to this possibility. They showed that East Berliners had a more pessimistic attributional style and greater depressive symptoms than West Berliners. One possible explanation of their findings as well as the present ones involves the depressogenic effects of living in a highly controlled society with relatively scarce resources. This explanation, however, seems less relevant to the present loneliness findings.

Of course, the present findings are not the first to discover large similarities in psychological content and processes across very different cultures. McCrae and Costa (1997) showed high levels of similarity of personality structure across a wide range of cultures. Trull and Geary (1997) also found that the Big-Five personality factor structure was the same in a U.S. and a Chinese sample. Chiu, Hong, and Dweck (1997) showed that the relation between U.S. participants' implicit theories of personality and their tendencies to make dispositional attributions was replicated in a Hong Kong sample. These converging findings suggest that there are many basic psychological processes in operation across cultures, presumedly the result of basic similarities in the human condition-the kinds of goals we seek, the kinds of problems we face, and the kinds of capabilities we have as a result of simply being human.

Clearly, additional studies using other methodologies and testing other theoretically derived propositions are needed. This broader nomological network of findings will ultimately determine the fate of particular explanations of the present attributional phenomena. The present research thus lays the groundwork for additional tests of both main ideas presented in this article: (a) Culture does influence attribution preferences, and (b) the basic consequences of particular attributional styles generalize across cultures.

IMPLICATIONS FOR FUTURE RESEARCH

Several implications emerge from the present study. First, cross-cultural research on attributions and attributional style would do well to go beyond the simple dispositional-situational distinction. It simply does not capture the nuances of meaning necessary to uncover systematic differences in preference.

Second, the success of general attributional principles across cultures suggests that claims of cultural limitations need to be tempered with the realization that all people and all cultures face many of the same adjustment tasks and succeed (or fail) them in much the same way. In other words, the angst and timidity frequently felt by social and personality process researchers when asked to consider the limitations of their samples may be an overreaction. Certainly, cross-cultural replications are important as are attempts to identify cultural differences and to incorporate them into our theories. However, we also need to understand that unsubstantiated claims that there will be huge cultural differences in underlying processes are no more valid than are any other type of unsubstantiated claim. Ultimately, it is an empirical question. (See Anderson & Bushman, 1997, for similar arguments about the external validity of laboratory aggression paradigms.)

Third, additional cross-cultural work on attributional style and depression and loneliness is needed. Interesting differences as well as similarities were uncovered in the present study. The finding that attributional style mediated the China/U.S. differences in general level of depression and loneliness is especially intriguing. Of course, additional studies are needed to confirm this mediation hypothesis. Longitudinal studies with participants from several different cultures would be particularly useful. Additional work using different procedures to assess attri-

butional style as well as replications using different subpopulations within various independent and interdependent cultures would usefully add to our understanding of attribution processes, attributional style, depression, loneliness, and cultural similarities and differences.

NOTES

1. A similar distinction has been made by Triandis (1990, 1994) and colleagues. In this view, the main dimension along which East and West (roughly) vary is individualism-collectivism. In general, Western cultures highly value individualism and consequently focus on individual accomplishments or failures to accomplish. Eastern cultures, by contrast, highly value collectivism and consequently focus on the collective contributions and to some extent the individual's contributions to the collective. Both of these cross-cultural approaches make the same predictions for the present research. The Markus version is highlighted in this article because it more explicitly focuses on the self-views important to these predictions. For excellent overviews, see Markus, Kitayama, & Heiman (1996) and Triandis (1995).

2. I have chosen to not present post hoc or simple effect tests for two reasons. First, there are many such possible comparisons in this data set. Second, as noted in the text, the different types of attributions are not totally independent. Both of these factors could boost the Type I error rate considerably. Therefore, specific descriptions of the interactions should be understood as such and not as implied statistical tests.

3. Figures 1 through 6 present the complete Source x Outcome x Interpersonalness breakdown of means for each of the 6 attribution categories. Two-way interactions can be gleaned by averaging across the noninteracting variable. Each figure also uses the same range on the y axis so that main effects of attribution category can be seen by comparing across figures.

4. The low and high levels of various predictor variables in all figures are at ± 1 SD from the combined sample mean.

5. The test of this relation between source and depression is identical to the t test reported earlier for the mean difference in depression level.

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