

Perception of Benefits and Costs During SARS Outbreak: An 18-Month Prospective Study

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In this study, the authors examined perceived benefits and costs of the outbreak of severe acute respiratory syndrome (SARS). Mixed accounts of benefits and costs, rather than exclusive accounts of only benefits or costs, were proposed to be characterized by nondefensiveness and enduring changes in psychosocial resources. Participants were 70 SARS recoverers, 59 family members of SARS recoverers, and 172 healthy adults residing in Hong Kong—a SARS-affected region. Results show that participants giving an exclusive account of benefits had higher levels of defensiveness than those giving a mixed account and those giving an exclusive account of costs. Only the perceived impact of benefits given in mixed accounts were related to future accruals in personal and social resources over an 18-month period.

Keywords: benefit finding, posttraumatic growth, SARS, severe acute respiratory syndrome

An unknown but life-threatening kind of pneumonia, termed severe acute respiratory syndrome (SARS) by the World Health Organization, plagued the international community in February 2003. As outbreaks of deadly communicable diseases (e.g., avian influenza, Ebola hemorrhagic fever) have raised the concerns of many people in the world, the SARS outbreak immediately caught worldwide attention, including researchers in the realms of psychology and health sciences. A search on PsycINFO and Medline databases revealed more than 2,000 articles about SARS published since March 2003. Current psychological studies on SARS (e.g., Cheng & Cheung, 2005; Ho, Kwong-Lo, Mak, & Wong, 2005; Maunder et al., 2004; Nickell et al., 2004) have adopted a deficit approach exploring negative consequences, such as physical and psychological symptoms, brought about by the outbreak. The sole focus on deficits in the existing literature overlooks another important type of consequence, namely, posttraumatic growth, which

may arise from the outbreak. We endeavored to balance the current emphasis on deficit by examining benefit finding among individuals affected by SARS.

Benefit finding refers to a form of cognitive adaptation in which individuals appraise their adverse situations in a positive light (see Taylor, 1983). Studies consistently have found a high incidence (typically 50%–90%) of benefit finding. A myriad of studies have shown that finding benefits in adversity is associated with adaptive outcomes (for reviews, see, e.g., Park, 1998; Tennen & Affleck, 2002). Relatively few, yet intriguing, studies have shown that benefit finding is unrelated to positive outcomes (e.g., Fromm, Andrykowski, & Hunt, 1996; Sears, Stanton, & Danoff-Burg, 2003) or is associated with maladaptive outcomes (e.g., Mohr et al., 1999; Tomich & Helgeson, 2004).

Mixed Versus Exclusively Positive/Negative Accounts

Such inconsistent findings cast doubt on the adaptive role of finding benefits per se in traumatic adjustment. Because the occurrence of desirable and undesirable events is equally common in life, a mixed report of both benefits and costs may be more realistic than a report comprising benefits only (see Lehman et al., 1993; Park, 1998). Taylor, Kemeny, Reed, and Aspinwall (1991) argued that perceived benefits have therapeutic effects only on individuals who acknowledge the costs that also occur in the trauma. An exclusive account of benefits implies a tendency to deny the presence of costs, whereas an exclusive account of costs implies failure to appreciate benefits (see Lehman et al., 1993; Taylor et al., 1991).

Compared with the body of studies on benefit finding, the number of studies examining both benefits and costs is scant. The small but intriguing body of studies (Collins, Taylor, & Skokan, 1990; Lehman et al., 1993; Taylor et al., 1991; Updegraff, Taylor, Kemeny, & Wyatt, 2002) found that when participants were asked to report major life changes in adversity, a considerable portion of them gave a mixed account containing both benefits and costs. Moreover, the study by Taylor et al. (1991) documented that,

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compared with those who cited only benefits, participants who gave a mixed account were better adjusted.

Adaptive Qualities Characterizing Mixed Accounts

Taylor et al. (1991) found that individuals giving a mixed account of benefits and costs were more adaptive than those giving an exclusive account of either benefits or costs. We extended their study by positing that mixed accounts may be characterized by two adaptive qualities.

Nondefensiveness

One adaptive feature of mixed accounts is that they contain no or few psychological defenses. When under threat, some individuals tend to deny or distort the source of distress to protect themselves from experiencing anxiety (see Westen, 1998). Although such a defense appears to be beneficial in preventing individuals from being overwhelmed by anxiety, this strategy can be maladaptive in hampering their ability to adapt to threatening circumstances, leaving them vulnerable to further psychological distress (see Allen, Hauser, & Borman-Spurrell, 1996). To adapt effectively to life stress, individuals need to be aware of painful thoughts and feelings (see Westen, 1998). By acknowledging negative consequences from their traumatic experiences, individuals who give a mixed account and those who give an exclusive account of costs are proposed to be characterized by low levels of defensiveness.

In contrast, we proposed that an exclusive positive account following adversity may reflect some form of defensiveness. Respondents giving an exclusive positive account may ignore or deny adverse consequences that actually exist. This idea stems from the literature on the attentional biases of repressors. Repressors are individuals who report low levels of anxiety but high levels of defensiveness (see, e.g., Eysenck, 1997). Previous studies (e.g., Ioannou, Mogg, & Bradley, 2004; Mogg et al., 2000) have shown that repressors tend to avoid negative stimuli and have an attentional preference for positive stimuli. Such attentional biases have been absent among their counterparts with similar levels of anxiety but lower levels of defensiveness. Thus, we proposed that individuals who give an exclusive account of benefits may be characterized by high levels of defensiveness.

Enduring Psychosocial Changes

Another adaptive feature of mixed accounts is their association with enduring psychosocial changes, which may be reflected by accrual of resources. This idea stems from Hobfoll's (1989) conservation of resource theory, which postulates that individuals are motivated to procure and preserve resources. The influence of resources on psychological well-being is especially salient in times of a crisis because a considerable amount of resources is consumed when individuals cope with traumatic events. With their fundamental needs gratified, individuals equipped with ample resources are more capable of adapting to traumatic events. A depletion of resources makes individuals more vulnerable to the adverse effects of trauma.

In the conservation of resource theory, personal and social resources are conceptualized as "two integral aspects of people's

identities" (Hobfoll, Freedy, Lane, & Geller, 1990, p. 467). Schaefer and Moos's (1992) model of personal growth also posited that effective coping with life stressors should be reflected by accruals of both personal and social resources. Successful coping strengthens one's threatened self-confidence and sense of self-efficacy, thus resulting in maintenance or an increase of self-esteem. Successful coping involves appreciating relationships with significant others as well as developing more intimate and loving relationships, thus obtaining more social support.

Individuals giving a mixed account are proposed to be different from those giving an exclusive account in acknowledging the coexistence of benefits and costs. Acknowledging the negative aspects of an adverse circumstance is essential for attaining personal growth (see Westen, 1998). We propose that individuals giving a mixed account are more likely to experience enhancement in levels of self-esteem and social support over time. Such links are proposed to be lacking for individuals reporting an exclusive account of either benefits or costs.

Aims and Overview of the Study

In the present study, we examined perceived benefits and costs in the context of the SARS outbreak in Hong Kong. SARS is a life-threatening and highly contagious disease, and virtually everyone who resided in an affected region was disturbed by the epidemic to some extent (see Cheng & Ng, 2006; Cheng & Tang, 2004). To broaden the generalizability of the present findings, we recruited not only individuals who were directly affected by SARS (i.e., those who had contracted SARS or those who were family members of SARS patients) but also those who were indirectly affected (i.e., those who resided in the same SARS-affected region but had not contracted SARS and did not know anyone who had contracted SARS). Although indirectly affected individuals and their network members had not suffered from the disease, they were affected by the outbreak in other ways, such as fear of infection and the requirement of wearing face masks at work (Cheng, 2004; Cheng & Tang, 2004).

Because SARS was an unknown disease and the outbreak was a unique experience, Phase 1 of the study explored both benefits and costs derived during the outbreak. The benefits and costs mentioned by participants were compiled into a questionnaire to be used in Phase 2. We examined the proposed differences in defensiveness levels and enduring psychosocial changes over an 18-month period among individuals with distinct accounts of benefits and costs. Specifically, we predicted that participants giving a mixed account and those giving an exclusive account of costs would be less defensive than participants giving an exclusive account of benefits. Among the three groups, only participants with a mixed account were proposed to report accruals in self-esteem and social support over time.

Phase 1

Method

Participants

There were three samples in this study. The first was the recoverer sample that consisted of 70 Chinese adults (33 men, 37 women) who recovered from SARS. Their average age was 38.61 years ($SD = 10.70$).

These participants were recruited through physician referrals coordinated by Wai-man Wong. The participants were admitted to the SARS (pneumonia) ward of Queen Mary Hospital, Hong Kong, between March 2003 and April 2003. All patients met the established diagnostic criteria (see Tsang et al., 2003), which included presence of high fever ($>38^{\circ}\text{C}$), presence of respiratory symptoms (cough, shortness of breath, and dyspnea), and close contact with a person diagnosed with SARS. Patients who were under 18 years of age, had cognitive impairments, or did not give informed consent were excluded.

The second was the recoverer–family sample that comprised 59 Chinese adults (24 men, 35 women) whose family members had contracted SARS, but they themselves did not. Their average age was 43.32 years ($SD = 11.34$). These participants were recruited through referrals from the SARS recoverers mentioned above, and they were the family members of the SARS recoverers. Only one family member of a SARS patient was allowed to take part in the study. All participants in the recoverer–family sample were over 18 years of age, had not contracted SARS, and had been living with their family members (SARS recoverers) for an average of 12.29 years ($SD = 8.17$). The exclusion criteria were the same as those for the recoverer sample. The inclusion and exclusion criteria were listed in an invitation letter; the family member of the SARS patient who volunteered to participate was asked to sign it.

The third was the indirectly affected sample that comprised 172 Chinese adults (75 men, 97 women) recruited from a population-based telephone survey. They did not have SARS and did not know anyone who had contracted SARS. Their average age was 43.76 years ($SD = 12.18$). The gender and age distribution of this sample was similar to that of the Hong Kong population (see Hong Kong Census and Statistics Department, 2002). None of the participants in this sample were related to those of the previous two samples. We used telephone numbers randomly generated by a computer program. The criteria for inclusion were a household member who (a) had the most recent birthday, (b) was over 18 years of age, (c) had not contracted SARS, and (d) did not know anyone with a SARS infection. In this survey, 500 households were contacted successfully, but 209 refused to participate (rejection rate = 42%), and 119 failed to meet the inclusion criteria.

Interview Protocol and Coding Scheme

A structured interview was conducted to compile items for developing a questionnaire to gauge perceived benefits and costs. In the interview, participants were asked: "Have you found any benefits, or costs, or both in your experience during the SARS outbreak?" This question was constructed on the basis of the interview protocols of prior studies (e.g., Davis, Nolen-Hoeksema, & Larson, 1998; Pakenham, Sofronoff, & Samios, 2004). Previous measures on benefit finding have assessed whether respondents perceive benefits. Extending these measures by examining both benefits and costs, the interview question was modified to allow participants to choose three options: (a) benefits only, (b) costs only, and (c) both benefits and costs. If participants reported any benefits and costs, they were asked to elaborate on each of them. If participants reported benefits only, they were asked whether they had experienced any costs as well and vice versa.

We conducted content analyses to code participants' responses to the open-ended question. To ensure reliability in data coding, we adopted the method of triangulation (see Yin, 2003). Specifically, 30 cases—10 from each sample—were randomly drawn. Two independent coders, who were experts in content analyses and unaware of the aims of the study, identified themes embedded in the selected set of responses. Each coder was asked to develop a tentative classification scheme with detailed elaboration on how the categories were defined.

In the classification scheme, each coder listed response units (i.e., phrases drawn from participants' interview data) within relevant categories to indicate how the categories were defined. For instance, phrases such as

"I'm healthier," and "my body is stronger" were listed within the "improved health conditions" category; whereas phrases such as "I washed my hands more frequently" and "I began to wear face masks" were listed within the "increased attention to personal hygiene/health" category. The categories were mutually exclusive. If participants gave more than one response, their responses were coded into different categories. Two types of responses were not coded: (a) responses irrelevant to the interview question (e.g., "I am old" and "even the World Health Organization doesn't know what SARS is") and (b) responses about others (e.g., "my friends were very upset" and "fewer people dined out these days").

In a follow-up meeting, the coders reviewed each other's classification scheme and indicated whether they disagreed with the other's categorization. Discrepancies were first reconciled between the coders, and unresolved disagreements were then reconciled by Cecilia Cheng.

To condense the set of categories, we combined responses deemed redundant. For instance, responses attributing reduced blame on the government, people in general, a group of people, and a particular person were combined to form a single category "reduced blaming on others/the government." Responses indicating increased frequency of helping others, showing greater concern about others, being more empathetic, and being more considerate of others were combined into the category of "increased help/concern for others." A finalized version of the coding scheme was derived on the basis of the discussion, and no further modifications were made thereafter. The final set comprised 21 benefit-related and 16 cost-related categories culled from the participants' responses (see Tables 1 and 2).

Procedures

For the recoverer and the recoverer–family samples, eligible participants were invited to participate in this study by a research nurse in the hospital. If participants agreed, they were asked to sign a consent form. They were then thanked and told that an interviewer would contact them by telephone later. The interviews were conducted between May 4 and May 28, 2003, that is, 4–5 weeks after the patients had been discharged ($M = 31.16$ days, $SD = 2.41$). An interviewer called the participants and sought their permission to conduct the telephone interview. If the participant agreed, the interview began. If the participant of the recoverer sample and the participant of the recoverer–family sample lived together, separate calls were made on different days. These participants were asked not to discuss their answers with their family members. For the indirectly affected sample, telephone interviews were conducted during the evening between May 12 and May 15, 2003.

Reliability Checks

We computed the kappa coefficient (Cohen, 1960) to examine intercoder reliability. Results reveal a good consistency between the two coders ($\kappa = .94$). Of the participants, 10% were randomly drawn from each sample and reinterviewed by the coordinator of the telephone interview. There was also a good consistency in the data asked by different interviewers ($\kappa = .87$). Moreover, 30 cases were randomly drawn for reliability checks by Cecilia Cheng. The coding of the selected cases was found to adhere to the coding scheme.

Results and Discussion

Participants who reported both benefits and costs were classified into the mixed group. Those who reported only benefits were categorized into the benefit group, and those who reported only costs were categorized into the cost group. The proportion of participants in the mixed, benefit, and cost groups was 67%, 19%, and 14%, respectively, for the recoverer sample; 71%, 20%, and 9% for the recoverer–family sample; and 47%, 29%, and 24% for

Table 1
Factor Loadings of Items for the Benefit Subscale ($n = 276$)

Item	Factor loading			
	Factor 1	Factor 2	Factor 3	Factor 4
Increased appreciation of life (4)	.79			
Changed values/life priorities (12)	.77			
Felt lucky/happier (8)	.73			
Learned to live in the present (13)	.72			
Increased courage to live (1)	.67			
Active participation in life (14)	.65			
Cast away bad habits (18)	.61		.49	
Increased self-efficacy/self-confidence (15)	.60			
Changed personality (7)	.53		.42	
Increased time spent on family members (5)		.86		
Increased appreciation of relationships with significant others (11)		.86		
Increased gratefulness/respect for health care workers (6)		.79		
Increased help/concern for others (16)		.68		
Increased time for exercise (3)			.66	
Increased attention to personal hygiene/health (17)			.65	
Changed lifestyle habits (2)			.59	
Increased time for rest (21)			.54	
Improved health conditions (9)			.49	
Reduced blaming on others/the government (19)				.92
Increased sense of belonging to the society (10)				.88

Note. All factor loadings below .40 were omitted for clear presentation. Item numbers are shown in parentheses. Item 20 was omitted. Factor 1 = personal growth; Factor 2 = interpersonal appreciation; Factor 3 = healthy lifestyle; Factor 4 = societal solidarity.

the indirectly affected sample. We performed a chi-square test of independence to examine differences in the distribution of participants in these three groups by gender and age group.¹ Results reveal no statistically significant differences for gender, $\chi^2(2, N = 301) = 1.76, p = .42$, or for age group, $\chi^2(8, N = 301) = 6.68, p = .57$.

A chi-square test of independence was also conducted to examine possible differences in the distribution by samples. Results show that the distribution of participants in the three groups was different among the three samples, $\chi^2(4, N = 301) = 16.49, p = .002$. To examine the source of differences, we conducted separate chi-square tests for each pair of samples. Results show that the indirectly affected sample differed from the recoverer sample and the recoverer-family sample, respectively, in the distribution, $\chi^2(2, Ns = 242 \text{ and } 231) = 8.52 \text{ and } 11.80, ps < .02$. The former sample had a smaller proportion of participants giving a mixed account and a greater proportion of participants giving an exclusive account of costs than did the latter two samples. However, there were no statistically significant differences in the distribution between the recoverer and the recoverer-family samples, $\chi^2(2, N = 129) = 1.06, p = .59$. Such a result indicates a similar distribution for the two directly affected samples.

In summary, the present results show that participants who construed both benefits and costs constituted the largest proportion in all three samples. However, the proportion was greater for participants directly affected by SARS (i.e., recoverers and family members of recoverers) than for those indirectly affected by it. Such results parallel previous ones by revealing a high incidence of benefit finding among patients, but the present results further show that patients recognized not only benefits but also costs in their traumatic experience.

Phases 2 and 3

Method

Participants

Participants were the same as those surveyed in Phase 1 of the study. For the recoverer sample, 67 participants took part in Phase 2, but 20 of them dropped out in Phase 3. In the final sample, there were 21 men and 26 women, with an average age of 39.17 years ($SD = 11.80$). For the recoverer-family sample, 55 participants took part in Phase 2, but 12 dropped out in Phase 3. There were 18 men and 25 women in the final sample, with an average age of 44.40 years ($SD = 11.48$). Although participants in the recoverer group and those in the recoverer-family group came from the same family, preliminary analyses that used intraclass correlations revealed that the two samples were relatively independent.² The two samples were combined to form a directly affected sample to increase the sample size and statistical power. For the indirectly affected sample, 154 participants took part in Phase 2, but 47 dropped out in Phase 3. The final sample consisted of 47 men and 60 women, with an average

¹ Participants were categorized into one of the following five age groups: (a) 18–29 years, (b) 30–39 years, (c) 40–49 years, (d) 50–59 years, and (e) >60 years.

² We performed intraclass correlations to examine the extent of independence of data between the recoverer and the recoverer-family samples. The data (i.e., positive and negative impact scores, defensiveness, self-esteem, and social support) of each SARS recoverer were matched with those of his or her family member. Intraclass correlations were then computed for each dyad. The z tests showed that the dyad-level processes were not significant (intraclass correlations ranged from .04 to .21, $ps > .05$), thus providing support for combining the two samples to form a single group.

Table 2
Factor Loadings of Items for the Cost Subscale (n = 276)

Item	Factor loading		
	Factor 1	Factor 2	Factor 3
Reduced self-confidence (11)	.75		
Shattered values/life goals (4)	.74		
Emotional disturbance (7)	.72		
Poorer health condition/pain (1)	.64		
Recognition of life as fragile/uncontrollable (14)	.61		
Reduced/lost hope for the future (13)	.61		
Fatigue (3)	.55		
Thoughts about bad luck (12)	.53		
Reduced social activities (2)		.80	
Avoidance of people (5)		.79	
Increased blame on others/the government (15)		.73	
Discrimination by others (9)		.72	
Increased expenditure (10)			.79
Changed financial status (8)			.75
Layoff/reduced working hours (6)			.69

Note. All factor loadings below .40 were omitted for clear presentation. Item numbers are shown in parentheses. Factor 1 = personal feebleness; Factor 2 = social estrangement; Factor 3 = financial problems.

age of 43.47 years ($SD = 11.72$). For all three samples, participants who dropped out did not differ from the final sample in any psychosocial variables, $F_s < 0.67$, $ps > .62$. All participants were remunerated 50 Hong Kong dollars (about 6.25 U.S. dollars) for taking part in Phase 2 and another 50 Hong Kong dollars for taking part in Phase 3.

Measures

Perceived benefits and costs. A questionnaire gauging perceived benefits and costs was constructed on the basis of participants' responses given in Phase 1. The questionnaire comprised two subscales: (a) Benefit and (b) Cost. Respondents were instructed to endorse those benefit- and cost-related items relevant to their experience during the SARS outbreak. If respondents endorsed any items, they were asked to give a rating that indicated the extent of its positive impact (for the Benefit subscale) or negative impact (for the Cost subscale) on them. The rating scale ranged from 1 (*a little*) to 4 (*very much*). Respondents were told that they could indicate any of the items as inapplicable. Such options were given a coding of "0."

To identify the internal factor structure of each subscale, we performed principal-components analyses with varimax rotations of factors based on the present data. For the Benefit subscale, the varimax rotated factor structure is shown in Table 1. We adopted the eigenvalue-one criterion, and the factor analyses yielded a five-factor solution. Because Item 20 (*increased faith in religion*) was the only item loaded on the fifth factor in this solution, this item was omitted in all the subsequent analyses. Omission of this item did not alter the pattern of results. The four-factor solution was considered optimal on the basis of three criteria: variance accounted for (56%), interpretability, and simple structure. An examination of the factor loadings of this model indicates that all the values are of an acceptably high magnitude, indicating that the items have a high structural validity. The four factors were labeled personal growth, interpersonal appreciation, healthy lifestyle, and societal solidarity. The Cronbach's alpha values for these four factors were .87, .84, .66, and .84, respectively. For each factor, the impact ratings were summed to create an impact score. Because the number of items for the factors was different, the impact scores were divided by the number of items in a factor so that the impact scores all ranged from 0 to 4 for ease of comparison. The four benefit-related impact scores were aggregated to form a perceived-benefit score, which ranged from 0 to 16.

For the Cost subscale, the varimax rotated factor structure is shown in Table 2. A three-factor solution emerged with an eigenvalue value greater than one. The three-factor solution was deemed optimal, and it accounted for 52% of variance. The high factor loadings indicate a high structural validity for the items. The three factors were labeled personal feebleness, social estrangement, and financial problems. The Cronbach's alpha values for the three factors were .80, .73, and .66, respectively. For each cost-related factor, an impact score was calculated with the same method for deriving the benefit-related impact scores. Each cost-related impact score also ranged from 0 to 4, and the aggregated perceived-cost score ranged from 0 to 12.

Defensiveness. Defensiveness was measured by the Marlowe-Crowne Social Desirability Scale (Crowne & Marlowe, 1960). This scale is a common measure adopted for assessing defensiveness (e.g., Derakshan, Myers, Hansen, & O'Leary, 2004; Feldman, Lehrer, Hochron, & Schwartz, 2002; Mogg et al., 2000; Myers, 1995). The defensiveness score ranges from 0 to 33. This scale has been found to be reliable and valid in Chinese samples (Yang, 1997). In this study, this measure had good internal consistency (Kuder-Richardson Formula 20 = .90).

Self-esteem. Self-esteem was measured by the Rosenberg Self-Esteem Scale (Rosenberg, 1965). The self-esteem score ranges from 10 to 40. This scale has been found to be a reliable and valid measure in Chinese samples (Hamid & Cheng, 1995). It also displayed good internal consistency in this study (Cronbach's $\alpha = .89$).

Social support. Social support actually received by participants was measured by the Inventory of Socially Supportive Behaviors (Barrera, Sandler, & Ramsay, 1981). The Chinese version of this measure consists of 28 items (Ma, Chan, Chi, & Sham, 1990). The social support score ranges from 0 to 84. This measure has displayed good reliability and criterion-related validity in Chinese samples (Ma et al., 1990). In this study, the items of the measure were internally consistent (Cronbach's $\alpha = .84$).

Procedures

A full set of questionnaires and a consent form were mailed to participants in Phase 2 of the study approximately 4–6 weeks after the interview (i.e., mid-June 2003). A return envelope was provided for the completed questionnaires. A check was mailed to participants on receipt of their questionnaires. The set of questionnaires sent in Phase 3 (mid-December 2004) comprised only the self-esteem and the social support measures. A

check and a debrief note were sent to all participants after receiving their questionnaires completed in Phase 3.

Results and Discussion

A new questionnaire on perceived impact of benefits and costs was developed. Tennen and Affleck (2002) posited that perceived benefits, regardless of quantity, can promote psychological growth. In their view, realizing more than one benefit may not provide additional gains. To examine this notion, we classified participants into one of two subgroups: (a) participants who reported one instance of benefits or costs and (b) those who reported more than one instance of benefits or costs. The multivariate analysis of variance (MANOVA) results show that the subgroup effect on the study variables (i.e., perceived benefits, perceived costs, self-esteem, and social support) was not statistically significant, $F(7, 147) = 1.11, p = .35$. Such results indicate that participants who reported one instance of benefits or costs and those who reported more than one such instance did not differ in any of the psychosocial variables.

In the present analysis, we first scrutinized the differences in both number and perceived impact of various benefits and costs among samples with distinct subjective accounts. Then we tested the hypotheses by examining whether participants with distinct subjective accounts differed in (a) defensiveness and (b) changes in self-esteem and social support over the course of the study. Table 3 shows the descriptive statistics of all the variables for the mixed, benefit, and cost groups in each sample.

Subjective Accounts and Endorsement of Benefit- and Cost-Related Items

Participants were categorized into the benefit, mixed, or cost group on the basis of their interview data obtained in Phase 1. In Phase 2, they completed a questionnaire comprising a list of benefit- and cost-related items. We first performed MANOVA to examine whether these groups differed in the number of benefit-

and cost-related items endorsed. Results reveal a statistically significant group effect, $F(4, 388) = 54.82, p < .0001$ (partial $\eta^2 = .36$). Post hoc Bonferroni tests showed that for the benefit-related items, the benefit group endorsed a greater number than the mixed group, who in turn endorsed a greater number than the cost group ($ps < .005$). For the cost-related items, the cost group endorsed more than the mixed group, who in turn endorsed more than the benefit group ($ps < .03$). Such results suggest that participants' perceived benefits and costs obtained by the interview matched those obtained by the questionnaire.

Subjective Accounts and Perceived Impact of Benefits/Costs

The questionnaire constructed in this study consisted of seven domains, four from the Benefit subscale and three from the Cost subscale. MANOVA was used to examine possible differences in perceived impact of these domains by sample and group. The two main effects were statistically significant, $F(14, 372) = 11.05$, and $F(7, 185) = 57.92, ps < .0001$, respectively (partial $\eta^2 = .29$ and $.69$, respectively). These main effects should be interpreted in light of the statistically significant Sample \times Group interaction effect, $F(14, 372) = 8.43, p < .0001$ (partial $\eta^2 = .24$). To further analyze this statistically significant interaction effect, we examined the group effect separately for the directly and the indirectly affected samples.

For the directly affected sample, the main effect of group was statistically significant, $F(14, 164) = 6.84, p < .0001$ (partial $\eta^2 = .37$). Univariate analyses revealed that the group effect was statistically significant in all the domains, $F(2, 87) > 3.62, ps < .03$ (partial η^2 ranged from .10 to .26), except for societal solidarity, $F(2, 87) = 1.13, p = .33$. Post hoc Bonferroni tests showed that for personal growth and interpersonal appreciation, the mixed and the benefit groups gave higher impact ratings than the cost group ($ps < .02$). For healthy lifestyle, the benefit group had higher impact ratings than the cost group ($p = .03$). For personal feeble-

Table 3
Descriptive Statistics of Study Variables by Sample and Group

Variable	Directly affected sample						Indirectly affected sample					
	Mixed ($n = 57$)		Benefit ($n = 20$)		Cost ($n = 13$)		Mixed ($n = 51$)		Benefit ($n = 27$)		Cost ($n = 29$)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Perceived benefits												
Personal growth	2.22 _b	1.88	2.83 _b	1.87	0.73 _a	0.58	1.86 _b	1.06	1.99 _b	1.05	0.78 _a	0.49
Interpersonal appreciation	2.80 _b	1.81	3.20 _b	1.24	1.38 _a	1.69	0.44 _a	1.10	1.51 _b	1.64	0.06 _a	0.32
Healthy lifestyle	2.20 _b	1.83	2.76 _b	1.80	1.11 _a	0.94	2.82 _b	1.53	2.95 _b	1.53	1.21 _a	0.77
Societal solidarity	0.53 _a	1.38	0.50 _a	1.67	1.23 _a	2.20	0.57 _a	1.65	2.81 _b	2.63	0.00 _a	0.00
Perceived costs												
Personal feebleness	1.42 _b	1.40	0.60 _a	0.39	2.46 _b	2.28	0.07 _a	0.20	0.20 _a	0.36	0.54 _b	0.85
Social estrangement	3.09 _b	2.07	0.28 _a	0.60	2.42 _b	2.83	0.45 _a	0.83	0.39 _a	0.56	0.79 _a	1.42
Financial problems	2.58 _b	1.78	0.93 _a	1.47	1.90 _b	2.12	0.42 _a	1.19	0.30 _a	0.62	1.10 _a	2.10
Defensiveness	16.26 _a	5.04	19.00 _b	5.11	15.03 _a	3.78	15.53 _a	4.63	17.89 _b	5.40	16.69 _a	4.15
Self-esteem—Phase 2	31.06 _b	3.36	31.41 _b	3.51	27.62 _a	3.14	31.35 _a	3.95	30.40 _a	4.33	30.15 _a	4.12
Self-esteem—Phase 3	32.12 _b	4.26	28.25 _a	3.92	28.92 _a	4.46	32.82 _c	4.21	28.89 _b	3.57	25.17 _a	3.51
Social support—Phase 2	44.75 _a	12.60	49.60 _b	12.98	41.31 _a	11.79	46.23 _b	11.86	48.11 _b	12.71	39.69 _a	8.99
Social support—Phase 3	46.53 _b	10.52	44.63 _b	9.99	39.28 _a	10.44	48.60 _b	9.58	47.30 _b	12.36	37.85 _a	10.75

Note. For each sample, means in the same row that have different subscripts differ at $p < .05$ by the post hoc Bonferroni tests.

ness, the benefit group gave lower impact ratings than the cost group ($p = .001$). For social estrangement, the benefit group had lower impact ratings than the mixed and the cost groups ($ps < .009$). For financial problems, the benefit group gave lower impact ratings than the mixed group ($p = .002$).

For the indirectly affected sample, the main effect of group was also statistically significant, $F(14, 198) = 9.30, p < .0001$ (partial $\eta^2 = .40$). Univariate analyses showed that the group effect was statistically significant in all the domains, $F_s(2, 104) > 8.28, ps < .0001$ (partial η^2 ranged from .14 to .29), except for social estrangement and financial problems, $F_s(2, 104) = 1.50$ and $2.92, ps > .06$, respectively. Post hoc Bonferroni tests showed that for personal growth and healthy lifestyle, the mixed and the benefit groups had higher impact ratings than the cost group ($ps < .0001$). For interpersonal appreciation and societal solidarity, the benefit group gave higher impact ratings than the mixed and the cost groups ($ps < .0001$). For personal feebleness, the mixed and the benefit groups had lower impact ratings than the cost group ($ps < .04$).

Subjective Accounts of Benefits/Costs and Defensiveness

Mean-level comparisons. We performed analysis of variance to examine the hypothesized differences in levels of defensiveness by sample and group. Results show a statistically significant main effect of group, $F(2, 191) = 5.80, MSE = 23.22, p = .004$ (partial $\eta^2 = .06$). The main effects of sample and the Sample \times Group interaction effect were not statistically significant, $F(1, 191) = 0.50$, and $F(2, 191) = 0.67, ps > .48$. As predicted, post hoc Bonferroni tests showed that the benefit group had a higher level of defensiveness than the mixed and the cost groups ($ps < .006$).

Patterns of covariation. In addition to making mean-level comparisons, we also examined the patterns of relationships among defensiveness, perceived impact of benefits, and perceived impact of costs for each group. For the benefit group, a statistically significant positive relationship was found between perceived impact of benefits and defensiveness, $r(47) = .37, p = .01$. A statistically significant inverse relationship was also obtained between perceived impact of costs and defensiveness, $r(47) = -.31, p = .03$. Such results indicate that the higher the level of defensiveness for participants in the benefit group, the greater the perceived impact of benefits and the lesser the perceived impact of costs they reported. For the other two groups, however, none of the correlation coefficients were statistically significant (rs ranged from $-.06$ to $.11, ps > .42$). The perceived impact of benefits and costs was unrelated to the levels of defensiveness for the mixed and the cost groups. These results suggest that only the greater impact of benefits and the lower impact of costs reported by the benefit group were confounded by defensiveness.

Subjective Accounts of Benefits/Costs and Longitudinal Psychosocial Changes

Mean-level comparisons. We performed a 2 (sample: directly affected, indirectly affected) \times 3 (group: mixed, benefits, costs) multivariate analysis of covariance on Phase 3 self-esteem and social support, with Phase 2 self-esteem, Phase 2 social support, and defensiveness included as covariates. The multivariate analysis of covariance results show only a statistically significant main

effect of group, $F(4, 376) = 17.34, p < .0001$ (partial $\eta^2 = .16$). Post hoc Bonferroni tests revealed that at Phase 3, the mixed group had higher self-esteem scores than the benefit group, who in turn had higher self-esteem scores than the cost group ($ps < .03$). The mixed and the positive groups had higher Phase 3 social support scores than the cost group ($ps < .01$).

Patterns of covariation. We also examined the extent of correspondence between (a) perceived impact of self-related benefits/costs assessed at Phase 2 and self-esteem assessed at Phase 3, and (b) perceived impact of relationship-related benefits/costs assessed at Phase 2 and social support assessed at Phase 3. Among the four benefit-related factors, personal growth was deemed most relevant to self-esteem, and interpersonal appreciation was deemed most relevant to social support. Among the three cost-related factors, personal feebleness was deemed most relevant to self-esteem, and social estrangement was deemed most relevant to social support. These four impact scores were included in the correlation analyses.

Because the results from the mean-level comparisons showed that the directly affected and the indirectly affected samples did not differ in the pattern of results, we conducted partial correlation analyses based on the pooled sample with the levels of Phase 2 self-esteem, Phase 2 social support, and defensiveness controlled. The results did reveal a statistically significant main effect of group, and thus separate partial correlation analyses were conducted for the mixed, benefit, and cost groups, respectively.

Table 4 summarizes the results of partial correlations for the three groups. For the mixed group, personal growth was significantly and positively associated with Phase 3 self-esteem. Interpersonal appreciation was also significantly and positively associated with Phase 3 social support. These results indicate that perceptions of a greater impact of benefits were related to a future increase in psychosocial resources for participants who gave a mixed account.

Table 4
Partial Correlations Between Predictors and Phase 3 Psychosocial Variables by Group, Controlling for Phase 2 Psychosocial Variables and Defensiveness

Predictor	Phase 3 psychosocial variable	
	Self-esteem	Social support
Mixed ($n = 108$)		
Personal growth	.44***	.19
Interpersonal appreciation	.16	.43***
Personal feebleness	.02	-.06
Social estrangement	-.09	.03
Benefit ($n = 47$)		
Personal growth	-.49**	.02
Interpersonal appreciation	-.01	-.36*
Personal feebleness	.04	-.04
Social estrangement	-.10	.03
Cost ($n = 42$)		
Personal growth	.24	.13
Interpersonal appreciation	.01	.29
Personal feebleness	-.01	-.08
Social estrangement	-.05	-.20

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

For the benefit group, the inverse relationship between personal growth and Phase 3 self-esteem was statistically significant. A statistically significant inverse relationship was also found between interpersonal appreciation and Phase 3 social support. Such results indicate that the perception of a greater impact of benefits was related to a future decrease in psychosocial resources over time for participants who gave an exclusive account of benefits.

For the cost group, a trend suggested that personal growth and Phase 3 self-esteem were positively associated, but this association was not statistically significant ($p = .14$). A similar nonsignificant positive trend was found between interpersonal appreciation and Phase 3 social support ($p = .07$). Taken together, such results supported our predictions that only mixed accounts were associated with positive psychosocial changes over time.

General Discussion

This study adopted a balanced approach that scrutinized both benefits and costs brought about by the SARS epidemic. Some negative effects of SARS have been identified in the literature. The present study extended this line of inquiry by revealing a large proportion of participants, directly or indirectly affected by SARS, who construed their experience as a mixed blessing containing both benefits and costs. The proportion of individuals giving a mixed account was larger for the directly affected sample than the indirectly affected sample. However, these two samples did not differ in the patterns of defensiveness and enduring psychosocial changes, indicating that the adaptive qualities characterizing mixed accounts are generalizable to a diverse group of individuals.

We developed a new measure for gauging benefits and costs related to SARS. Several benefit- and cost-related domains were identified, thus advancing our understanding regarding the array of life changes derived from the epidemic. Two domains of SARS-related benefits—personal growth and interpersonal appreciation—were similar to those of other measures assessing benefit finding (e.g., Bower & Segerstrom, 2004; McMillen & Fisher, 1998; Pakenham, 2005; Tedeschi & Calhoun, 1996). Although such results suggest that these are “global” beneficial qualities prevalent across a variety of traumatic circumstances, the qualities may be organized differently by participants from distinct cultural backgrounds. For instance, Tedeschi and Calhoun (1996) found that North American participants perceived “appreciation of life and changed priorities,” “personal strength,” and “recognition of new possibilities” as independent domains. However, the present study shows that Chinese participants perceived them to be submerged under the broad domain of “personal growth.” In addition, benefits specifically related to the SARS outbreak were found. The development of a healthy lifestyle and a heightened sense of solidarity are benefits that appear to be relatively specific to the SARS outbreak. Because this study is the first attempt to examine benefit finding among Chinese individuals in the context of the SARS outbreak, whether such discrepancies were attributable to cultural or contextual differences remain to be explored.

It is important to reiterate that this measure was specifically designed for assessing benefit finding in response to the SARS outbreak. Given its narrow focus, the domains of perceived benefits derived from it may not reflect the entire spectrum of benefit domains. For instance, the present results show that only one item—increased faith in religion—was loaded on a factor. This

item was omitted in the analyses because of statistical considerations. However, this does not imply that factors related to religion play an unimportant role in benefit finding. The present study should thus be replicated in other traumatic contexts to enhance the generalizability of results.

At a broader level, the present study expanded the literature on benefit finding in three ways. First, the present study may reconcile the conflicting findings regarding the adaptive role of benefit finding. As mentioned in the introduction of this article, some studies have shown that benefit finding is positively related to psychological well-being, but other studies have shown no or even inverse relationships. We proposed that these seemingly contradictory findings may be accounted for by different types of subjective accounts of benefits.

Our results suggest that benefit finding can be exhibited in two ways: (a) an exclusive account of benefits and (b) a mixed account of benefits and costs. The distinction between these two types of benefit finding is essential because of their different implications for psychological well-being. Specifically, the former group was characterized by higher levels of defensiveness and future reductions in psychosocial resources over time, whereas the latter was characterized by lower levels of defensiveness and future accruals in psychosocial resources over time. Integrating our findings into the existing literature, we infer that the positive associations between benefit finding and psychological well-being may largely be found among participants who perceive benefits as well as costs, probably because of their tendency to accept and resolve the costs (see Lehman et al., 1993; Taylor et al., 1991). By contrast, the unreliable or inverse associations may largely be found among participants who perceive benefits but not costs, probably because of their failure of acknowledging costs and thus leaving the problems intact (see Lehman et al., 1993; Taylor et al., 1991). In short, assessment of both benefits and costs may enable researchers and clinicians to make more refined predictions regarding the adaptive role of benefit finding.

Second, the present study is the first to our knowledge to examine defensiveness in the study of benefit finding. Participants who gave an exclusive account of benefits had higher levels of defensiveness than their counterparts who gave a mixed account and those who gave an exclusive account of costs. Moreover, for participants who gave an account containing only benefits, their perceived impact of benefits was positively and reliably related to levels of defensiveness. For more accurate measurements of subjective accounts following adversity, researchers and clinicians should consider the potential problem of defensiveness. If a respondent who has experienced trauma gives an exclusive account of benefits, efforts should be taken to mitigate defensiveness so as to explore and acknowledge the negative consequences of adversity.

Third, the present study may provide insights for the issue of genuine versus illusory benefit finding raised by some psychologists (see, e.g., Davis, 2001; McMillen & Cook, 2003; Tennen & Affleck, 2002; Wortman, 2004). These psychologists posited that perceived benefits are deemed genuine if they can be translated into real positive sequelae, whereas perceived benefits are deemed illusory if they represent merely cognitive constructions. To address this issue, we related participants' subjective accounts of benefits and costs to enduring changes in psychosocial resources. The perceived benefits cited in mixed accounts correspond to a

future increase in both personal and social resources over time. However, exclusive accounts of benefits are associated with a future reduction in psychosocial resources. Thus, genuine benefit finding may not preclude the recognition of costs but instead be characterized by a mixed account of both benefits and costs. Researchers and clinicians should assess not only clients' verbal accounts on their subjective experience but also other indicators of psychological well-being (e.g., levels of self-esteem, availability of social resources) to have a better understanding of the phenomenon of benefit finding.

Several qualifications regarding the present study must be addressed. The present study adopted a prospective design in which participants were grouped in terms of their responses in Phase 1, and group differences in changes in psychosocial resources over time were examined. Given that benefit finding is an ongoing process rather than a static outcome (see Tedeschi & Calhoun, 2004), some participants who gave an exclusive account at the outset may have developed a more balanced outlook of life at a later stage. Future studies should assess participants' perception of benefits and costs at various phases of the study and examine whether there are any changes in group membership over the course of study.

It is also important to note that all the SARS patients in our study had recovered, and none of the family members experienced bereavement. Their perceived impact of benefits was generally greater than their perceived impact of costs (see Table 3), suggesting a net (reported) gain in their experience during the SARS outbreak.³ Such findings are different from previous studies on bereavement (see Wortman, 2004, for a review). Such inconsistencies in results may be attributable to differences in event controllability. Recovery from illness is perceived as a controllable event in which outcome is amenable to change by one's effort (e.g., Frank, Johnston, Morrison, Pollard, & MacWalter, 2000; Moser & Dracup, 2004), whereas bereavement is perceived as an uncontrollable stressor in which outcome is unlikely to be altered by one's effort. Previous studies (e.g., Cheng, 2001, 2003; Lefcourt, 1992) have documented that stressful events of different extents of controllability have exerted distinct impacts on individuals' thoughts and behaviors. Hence, the present findings may not necessarily be applicable to bereaved family members of SARS patients.

Finally, because the virus is highly contagious and the symptoms of SARS are severe enough to interfere with one's ability to complete the questionnaire, answering the questionnaire was postponed until the patients had recovered. Thus, the possible influence of the timing should be noted. Specifically, the baseline levels of self-esteem and social support assessed at the initial phase may be an outcome of their recovery process. For instance, it is possible that the SARS patients or their family members who fared better were those who had already received additional resources in the course of recovery or were equipped with resources before their infection of SARS. Because no preincident data were available, these possibilities remained speculative, but they must be considered when interpreting the data.

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