



# Psychological impact of the Prestige catastrophe<sup>1</sup>

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**ABSTRACT.** There have been many studies on natural and technological disasters which point out the dramatic effects that these types of phenomena have on the psychological health of individuals and communities. Studies on the psychological consequences of the oil spill from the tanker Exxon Valdez demonstrated that the psychological impact on the population had been as significant as the environmental one. Nevertheless, these results cannot be generalised, as the characteristics of the disaster, along with the personal and social resources available to the affected population, also have to be taken into account. In this descriptive study, we shall analyse the impact of these three factors over different psychological and psychosocial measurements recorded in individuals affected by the Prestige disaster. The results show that those affected have received a good deal of social support and are satisfied with the economic aid received. These aspects, which serve to reduce the uncertainty generated in disasters, may have been crucial in alleviating the psychological impact of that event. Moreover, the inter-group analyses carried out show that those affected with high support and satisfaction scores are currently in a better situation than those affected with low scores in those variables, and even better than those not affected.

**KEY WORDS.** Prestige. Psychological impact. Catastrophe. Descriptive survey study.

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**RESUMEN.** Son muchos los estudios sobre desastres naturales y tecnológicos que señalan los dramáticos efectos que ese tipo de fenómenos tienen sobre la salud psicológica de las personas y las comunidades. Los trabajos sobre las consecuencias psicológicas del vertido del petrolero Exxon Valdez demostraban que el impacto psicológico sobre la población había sido tan significativo como el ambiental. Pero esos resultados no pueden generalizarse, pues hay que tener en cuenta las características del desastre y también los recursos personales y sociales de los que dispone la población afectada. En este estudio descriptivo, analizamos la incidencia de tres de esos factores sobre diferentes medidas psicológicas y psicosociales registradas en personas afectadas por el Prestige. Los resultados muestran que los afectados han tenido un alto apoyo social y se sintieron satisfechos con la ayuda económica recibida. Esos aspectos, que sirven para reducir la incertidumbre generada en los desastres, pudieron ser claves para amortiguar el impacto psicológico de ese acontecimiento. Además, los análisis intergrupo realizados muestran que los afectados con puntuaciones altas en apoyo y satisfacción tiene una situación mejor que los afectados con baja puntuación en esas variables e incluso mejor que los no afectados.

**PALABRAS CLAVE.** Prestige. Impacto psicológico. Catástrofe. Estudio descriptivo mediante encuesta.

In November 2002, the petrol tanker Prestige broke up and subsequently sunk off the Galician coast. Of the cargo of fuel oil the ship was transporting, 63,000 tonnes reached the coast in three successive black tides. Close to 1,900 km of Galician coast were affected, as well as other areas of the Cantabrian and French coast. The sheer size of this disaster, the management thereof and the communications policy would give rise to significant organised demonstrations and social protests. Moreover, this reaction is easily explainable, as this was just another in a long list of catastrophes (Urquiola, 1976; Andros Patria, 1978; Aegean Sea, 1992, among others) which still reside in the collective memory of Galician citizens.

The ecological and economic consequences of catastrophes such as that of the Prestige are obvious; hence the need to carry out studies to enable us to verify their exact range, to design action strategies to palliate their impact, and to draw up prevention plans. But apart from these aspects, it should be taken into account that these types of disasters can also give rise to other types of damage which, *a prima facie*, may be less evident. Here we allude to those that may affect the psychological well-being of individuals and relationships and the social climate within the community. Indeed, there are a large number of studies in the bibliography that highlight different psychological consequences of natural and technological disasters (Bromet, Parkinson, Schulberg, and Dunn, 1980; Chung, Dennis, Easthope, Werrett, and Farmer, 2005; Favaro, Zaetta, Colombo, and Santonastaso, 2004). One of the disasters to receive the greatest amount of attention in this field was the Exxon Valdez oil spill, which took place off the coast of Alaska in March 1989. As it shared a number of common characteristics with the Prestige, this event was constantly recalled in Galicia during the winter of 2002.

One of the studies carried out as a result of the Exxon Valdez catastrophe consisted in analysing the relationship between the degree of affectation perceived among the

population and the appearance of symptoms such as anxiety, stress and depression (Palinkas, Petterson, Russell, and Downs, 1993). The results of that study led the authors to conclude that the psychological impact on the population was as significant as the environmental one. In another study carried out by the same authors (Palinkas, Downs, Petterson, and Russell, 1993) a generalised deterioration in the social and work behaviour of the inhabitants of the area was verified, along with an increase in problems related with drug/alcohol abuse, and cases of domestic violence. Later, Picou and Gill (1998) monitored the impact brought about by the Exxon Valdez disaster, and they found chronic signs of stress among the section of the population most affected, which was precisely that most dependent on the commercial activity related with fishing.

The above data could lead one to consider that this type of disaster always gives rise to the same consequences. Nevertheless, that would not be a correct assumption, given that, as psychological data repeatedly show, the responses of individuals and groups to these types of situations are determined not only by the seriousness thereof, but also by how those situations are interpreted and by the psychological and social resources that may be available. The upshot of this last reason is that two disasters of a similar size may have a very different economic, psychological, social or even political impact. For this reason, and before referring to the psychological effects brought about by the Prestige disaster, we should make a reference, although a necessarily brief one, to some of those modulating variables, in order to gain a better understanding of the results obtained and the importance of these mediating factors.

One of the elements to be considered is the type of damage caused and the actions taken to minimise its impact. In this sense, a disaster that results in a significant loss of human life is not the same as another in which the damage is purely economic; and is not the same if the individuals and the community affected should have resources available to face up to these problems than if they do not have them. The prestige disaster was a significant threat for one of the most traditional and booming economic sectors in Galicia, namely, fishing and the commercial activity related to it. Thus, in this case, on top of the ecological impact, for a good many people that accident gave rise to scenario of economic and industrial uncertainty. In fact, this was one of the arguments used at that time for social mobilisation against those who were pointed out as being the responsible for this disaster. Faced with situations of these characteristics, it is essential to evaluate the social support received by the population affected, and the measures adopted to minimise the economic damage brought about. These two factors—one of a psychological character and the other of a material nature—make it possible to cover the need for security that becomes apparent in this type of incident. In this sense, it is to be expected that they have an important bearing on the responses of the population.

The third modulating variable we wish to analyse in this work has its origin in the cognitive models of emotion (Lazarus and Folkman, 1984). In accordance with these approaches, the reaction to a given situation depends on two factors: a) the cognitive appraisal that is made of it; and in the case of this being threatening, b) the appraisal of the resources available to avoid negative consequences. This second appraisal is linked with coping, which is defined as those constantly changing behavioural and

cognitive efforts that are made to handle the specific external and/or internal demands that are perceived as excessive for the individual's resources (Lazarus and Folkman, 1984). Thus, faced with stressful circumstances, such as that brought about by the Prestige accident, individuals may resort to different coping strategies. In some cases they will opt for approximative strategies, which may be either cognitive or behavioural, and in others, they will adopt evasive strategies, which may also be cognitive or behavioural. The different manner of dealing with the threatening event has effects on the subjects' future psychological state, with approximative strategies proving to be more adaptive, in principle.

Of that commented on up until this point, we would highlight two ideas: firstly, that there are wide range of studies that show different psychological and social consequences derived from disasters such as that of the Prestige; and secondly, there is series of variables that may modulate these effects.

The aim of this study is to analyse the consequences brought about by the oil spill on the inhabitants of the coastal areas affected, in terms of social variables, such as the level of political confidence, interpersonal relationships and mental health. These variables were analysed according to the degree of affectation of the disaster, the social support, the level of satisfaction or the financial aid received and the type of coping strategy employed. This will enable us to verify how these factors modulated the psychological impact that the Prestige disaster has had.

In accordance with the classification of research designs proposed by Montero and León (2007), the methodology employed in this study is quantitative, adhering to the characteristics of a population description design by means of surveys with probabilistic samples. The study is organised in line with the criteria established by Ramos-Álvarez, Moreno-Fernández, Valdés-Conroy, and Catena (2008).

## **Method**

### *Participants*

In this study 938 subjects took part, aged between 18 and 65. Of these, 58.20% were male, 41.80% female, and the average age was 39.80, with a standard deviation of 12.80. The subjects were chosen at random from 23 locations along the entire Galician coast. With regard to selection, the coast was divided up into three zones, depending on their greater or lesser proximity to the location of the spill from the Prestige. From the closest area, the Costa da Morte, subjects were chosen from among the residents of eleven different locations. From the second zone, in order of proximity (Rías Baixas), residents were chosen from seven locations, and from the furthest zone (the Mariña area in Lugo) subjects were selected from five locations.

Approximately 40 individuals participated from each location; of these, half were fishermen or were involved in a work activity closely linked with fishing. The other half comprised a wide ranges of professions not linked to fishing (entrepreneurs, housewives, civil servants, students, workers from different sectors and senior citizens).

### *Measuring instruments*

A protocol collecting a wide range of variables was applied; here mention is only made of those used in this study.

- Degree of perceived involvement. A scale of six items was used, adapted from Palinkas *et al.* (1993). With the responses to each one of these items, codified as zeros or ones, the degree of affectation was graded on a scale from 0 (*no affectation*) to 6 (*the maximum level of affectation perceived*).
- Perceived social support. The social support received by the affected parties was measured at two different instants: a) at the moment of the spill, b) at the moment when the questionnaire was given (one year after the spill) when different types of social support could be distinguished.
- Satisfaction with the financial aid received: Here subjects had to state their degree of satisfaction with the economic aid received on a scale from 0 (*totally unfulfilled*) to 10 (*highly satisfied*).
- Coping with the problem. In order to measure the affected parties' strategies for coping with the problem, a simplified version of the coping response inventory (CRI-ADULT) was used (Moos, 1993); this offers psychometric guarantees with internal consistency indices (Cronbach alpha coefficient) that oscillate between .59 and .74. The response scale ranged from 1 (*never*) to 4 (*frequently*). The process of drawing up this measurement instrument complies with the norms established by Carretero-Dios and Pérez (2007).
- Social relationships. Five items were included with the aim of measuring the possible affectation of subjects' social relationships. Subjects had to respond whether the situation after the disaster was 1 (*worse*), 2 (*the same*) or 3 (*better*).
- Confidence in institutions. Subjects were asked whether their confidence in different organisations, institutions and political agents was 1 (*lower*), 2 (*the same*) or 3 (*higher*) after the Prestige disaster. The stimuli assessed were as follows: fishermen's associations, trade unions, political parties, political leaders, the government of the autonomous region of Galicia, central government, town council and provincial council.
- Mental Health Questionnaire: In order to record this type of variable, we used a simplified version of the SCL-36 (Derogatis, 1993), in which a list of a 31 possible symptoms were listed, grouped into six dimensions: *Somatisation, Interpersonal sensitivity, Anxiety, Hostility, Depression and Functional impediment*. The intensity of the symptoms was expressed in a scale ranging from 1 (*nothing*) to 5 (*a lot*). The internal consistency of this instrument oscillated between .71 for the psychotism dimension, and .85 for the depression dimension, while the test-retest reliability ranged from .68 (somatisation) to .90 (anxiety). The process for drawing up this measurement instrument complies with the norms established by Carretero-Dios and Pérez (2007).

### *Procedure*

A group of 10 survey takers were selected, all of whom were psychologists, and these were trained in the application of the questionnaires.

Contact with the fishermen was made through the fishermen's associations, and a previously established route selection method was followed for the rest of the sample. When starting the interview, survey takers introduced themselves as being collaborators of the University of Santiago Compostela carrying out a study on different psychological aspects related with the Prestige spill. Then, in order to obtain greater involvement from the participants, they were informed of the usefulness of the research in verifying some of the consequences that has come about and for preparing strategies that would make it possible to act more effectively when faced with this type of event in the future. They were also assured of the confidentiality of the information to be supplied.

The interviews were performed between 20 December 2003 and 1 March 2004, approximately 1 year after the spill.

#### *Data analysis*

The analyses were performed using the SPSS statistical packages, version 13.0.

Initially, a four-way MANOVA was performed: level of involvement, satisfaction with economic aid received, social support and coping strategies. As dependent variables, we employed political confidence, social relations and the six dimensions of the SCL-36. In none of the cases were the interactions of factors significant. Thus, each factor was analysed separately, in such a manner that three groups were formed: a group of non-affected subjects, and two groups of affected subjects – one with a high score and the other with a low score in the corresponding factor. To compare these three groups, ANOVAs were performed, employing the same dependent variables mentioned above.

### **Results**

The results are presented in the following manner: firstly, certain descriptive ones of interest related with the perceived social support for the affected parties and with the degree of satisfaction with the financial aid received. These are two of the responses—one fundamentally from the citizenry, and the other from the administration—that arose due to the effects of the disaster, and which, as we commented on above, must be modulating the psychological impact brought about by the Prestige. Secondly, we present the results of the ANOVAs for the different factors and dependent variables considered.

#### *Descriptive results for social support and satisfaction with the financial aid received*

- Social support. Table 1 shows the mean scores for the social support that the affected individuals received from other individuals and groups. The interval of the social support scale ranges from 1 to 4, revealing that the social support was very high at the time of the accident, with the exception of that provided by the political authorities. A comparison between the scores at instant 1 and instant 2 (one year after the disaster) shows statically significant differences, with the scores at instant 2 being the lowest. In any case, this social support was still notable, especially by those groups closest to the subjects.

**TABLE 1.** Mean scores for social support perceived by affected individuals.

	<i>Family</i>	<i>Neighbours/friends</i>	<i>Workmates</i>	<i>Society</i>	<i>Authorities</i>
Instant 1	3.38	3.16	3.26	3.45	1.91
Instant 2	3.03	2.77	2.93	2.74	1.77

*Notes.* Instant 1: at the time of the accident. Instant 2: one year after the accident.

- Satisfaction with the aid received: with regard to satisfaction with the aid received, the mean score was 6.47, with a standard deviation of 2.70, for a scale range of 0 - 10. This score is relatively high, above all if we take into account that this is a matter in which social desirability does not favour a positive response. Table 2 describes the satisfaction with the aid on the basis of percentage of economic losses declared.

**TABLE 2.** Degree of economic affectation and satisfaction with aid.

<i>Economic affectation</i>	<i>Satisfaction with economic aid received.</i>			<i>Total</i>
	<i>Unsatisfied</i>	<i>Fairly satisfied</i>	<i>Satisfied</i>	
Between 0% - 10%	1.10%	6.40%	92.60%	100%
Between 20% - 40%	3.80%	16%	79.70%	100%
Between 50% - 100%	9.90%	14.40%	75.70%	100%
Total	5.30%	12.30%	82.40%	100%

As can be seen, the percentage of individuals satisfied with the economic aid received is fairly high, even among those who suffered the greatest losses.

*ANOVAs for the dependent variables and modulating factors*

We shall present the results for each one of the dependent variables analysed in this study.

- Personal relationships. The mean scores for the different settings of personal relationships analysed show that, in this setting, subjects declare themselves to be in a situation practically equivalent to that prior to the Prestige disaster. In fact, mean scores in practically all cases take the value 2, signifying that there has been no change. These results are so stable that they undergo no variation with regard to the modulating variables with which we have worked: satisfaction with financial aid received, coping strategies and social support. The only exception arises in relation to item in which subjects were asked about whether their life in general is different now from their life before the Prestige spill. Specifically for this question, the ANOVA performed shows that there are significant differences between non-affected subjects (1.99), and those subjects affected with a low level of satisfaction regarding aid received (1.75).
- Political confidence. The ANOVA performed on this variable, with the factors of involvement and satisfaction with the financial aid received, shows that there are

no significant differences with regard to the political stimuli considered. None of the mean scores for the different stimuli reaches a score of 2, which points to the same level of confidence as prior to the accident. Those displaying satisfaction with the aid received show slightly higher levels of confidence than those with low confidence but, as we have already mentioned, this difference is statistically significant. The ANOVA with the political confidence and with the coping strategy factor show no significant differences between the different groups. With regard to the ANOVA performed with this variable and social support, significant differences were found between the groups of subjects, as shown in Table 3. The mean score is very low for all political stimuli, since a score of 2 is not reached in any case. The statistically significant differences appear between the group of affected subjects with low social support and the groups of affected subjects with high social support and the non-affected. The group declaring the least confidence to all the political stimuli considered is that of affected individuals with low social support; whilst the group of affected individuals with high social support is the one which showed greatest confidence - even higher than non-affected individuals.

**TABLE 3.** ANOVA for political confidence and social support.

<i>Dependent variables confidence in:</i>	<i>F</i>	<i>p</i>	<i>Post hoc (Dunnett)</i>	<i>Mean differences</i>	<i>p</i>
Political Parties	$F_{(2,183)} = 5.18$	.006	Afect. <sub>LSS</sub> → No Afect	-.27	.005
			→ Afect. <sub>HSS</sub>	-.32	.004
Political Leaders	$F_{(2,183)} = 5.20$	.006	Afect. <sub>LSS</sub> → No Afect	-.27	.005
			→ Afect. <sub>HSS</sub>	-.32	.004
Government of Galicia	$F_{(2,183)} = 3.68$	.030	Afect. <sub>LSS</sub> → Afect. <sub>HSS</sub>	-.32	.020
Central Government	$F_{(2,183)} = 4.70$	.010	Afect. <sub>LSS</sub> → No Afect	-.29	.022
			→ Afect. <sub>HSS</sub>	-.36	.008
Town Council	$F_{(2,183)} = 7.30$	.001	Afect. <sub>LSS</sub> → No Afect	-.43	.0001
			→ Afect. <sub>HSS</sub>	-.43	.002
Provincial Council	$F_{(2,183)} = 7.66$	.001	Afect. <sub>LSS</sub> → No Afect	-.36	.0001
			→ Afect. <sub>HSS</sub>	-.38	.001

*Notes.* Afect.<sub>LSS</sub> = Affected individuals with low perceived social support. Afect.<sub>HSS</sub> = Affected individuals with high perceived social support.

- Mental health. Firstly we analysed the results for the dimensions of the SCL-36 scale with the satisfaction factor with the aid received. The significant differences shown by the ANOVA are presented in Table 4.

**TABLE 4.** ANOVA for mental health and satisfaction with aid.

<i>Dependent variables</i>	<i>F</i>	<i>p</i>	<i>Post hoc (Dunnett)</i>	<i>Mean differences</i>	<i>P</i>
Somatisation	$F_{(2,185)} = 3.15$	.045	Afect. <sub>LAS</sub> → Afect. <sub>HAS</sub>	.32	.018
Inter-personal sensitivity	$F_{(2,185)} = 2.50$	.049	Afect. <sub>LAS</sub> → Afect. <sub>HAS</sub>	.14	.039
Anxiety	$F_{(2,185)} = 2.44$	.048	Afect. <sub>HAS</sub> → No Afect. → Afect. <sub>LAS</sub>	-.09 -.10	.016 .011
Hostility	$F_{(2,185)} = 2.32$	.050	Afect. <sub>HAS</sub> → No Afect. → Afect. <sub>LAS</sub>	-.15 -.15	.020 .029
Depression	$F_{(2,185)} = 3.83$	.023	Afect. <sub>LAS</sub> → Afect. <sub>HAS</sub>	.02	.009
Functional impediment	$F_{(2,185)} = 2.30$	.050	Afect. <sub>HAS</sub> → No Afect.	-.09	.020

*Notes.* Afect.<sub>LAS</sub> = Affected individuals with low aid satisfaction. Afect.<sub>HAS</sub> = Affected individuals with high aid satisfaction

In spite of the significant differences existing between these different groups, the average scores for all of them are fairly low (the majority slightly over 1, and no dimension reaches 2). Also worthy of mention is the fact that both in the groups presenting significant differences and in those that do not, the trend is the same: the group of affected individuals satisfied with the financial aid received has a lower score in the mental health symptoms than the group of affected individuals unsatisfied with the aid, and even lower than the group of non-affected individuals. The results using the grouping of coping strategies as a variable are shown in Table 5.

**TABLE 5.** ANOVA for mental health and coping strategy.

<i>Dependent variables</i>	<i>F</i>	<i>p</i>	<i>Post hoc (Dunnett)</i>	<i>Mean differences</i>	<i>P</i>
Somatisation	$F_{(2,268)} = 3.74$	.025	Afect. <sub>EC</sub> → Afect. <sub>AC</sub>	-.31	.001
Depression	$F_{(2,268)} = 2.80$	.040	Afect. <sub>EC</sub> → Afect. <sub>AC</sub>	-.12	.004
Functional impediment	$F_{(2,268)} = 2.47$	.050	Afect. <sub>EC</sub> → No Afect. → Afect. <sub>AC</sub>	-.10 -.11	.010 .006

*Notes.* Afect.<sub>EC</sub>: Affected individuals with evasive coping strategies. Afect.<sub>AC</sub>: Affected individuals with approximative coping strategies.

Once again, the first thing that should be highlighted is that the scores in the mental health dimensions are truly low. That being said, also worthy of mention is that fact that it is the evasive strategies which seem to protect subjects better when faced with the type of psychological symptomology analysed herein. Lastly, the results of the ANOVA with social support as a grouping factor are shown in Table 6.

**TABLE 6.** ANOVA for mental health and social support.

<i>Dependent variables</i>	<i>F</i>	<i>p</i>	<i>Post hoc (Dunnett)</i>	<i>Mean differences</i>	<i>p</i>
Anxiety	$F_{(2,207)} = 3.38$	.050	Afect. <sub>LSS</sub> → Afect. <sub>HSS</sub>	-.11	.039
Hostility	$F_{(2,207)} = 1.30$	.049	Afect. <sub>LSS</sub> → Afect. <sub>HSS</sub>	-.14	.033

*Notes.* Afect.<sub>LSS</sub>: Affected individuals with low social support. Afect.<sub>HSS</sub>: Affected individuals with high social support.

The significant differences that appeared in two of the symptoms of the SCL-36 scale show that high level of social support perceived translates into a lower score in anxiety and hostility.

### Discussion

The principal aim of this study was to explore certain possible psychological consequences deriving from the Prestige disaster. Unlike other previous research into technological disasters, besides studying those effects, we also took into account a set of variables that could modulate or even alleviate them.

For this reason, the primary objective of this study consisted in verifying what perception the affected individuals had of two matters that are so intrinsic for personal and social stability: support from the community and financial aid received. The data are conclusive: the individuals affected felt supported by their reference social groups and by the community as a whole and, in the majority of cases, they are satisfied with the aid received. This scenario is very different from those encountered in other technological disasters, in which the affected groups do not have this support and resources available. For example, in the case of the Exxon Valdez, contact with individuals who had gone to that zone on the basis of the accident created conflict in the affected community, at the same time as the sharing out of the economic aid was not considered fair.

The high scores in these variables for the individuals affected by the Prestige may point to the notion that the psychological consequences described for other, similar accidents did not come about in this case. Indeed, in the first place, a year on from the event it can be seen that the relational sphere of affected individuals is largely unaltered. Secondly, neither is there any relevant clinical symptomology. In fact, the scores in the SCL-36 scale were very low in all analysed groups. Another piece of data that backs up the relevance of these two mediating factors is that the groups of affected individuals that score highest in one of them (support or satisfaction) demonstrate, in all cases, a better psycho-social profile—including the control group of the non-affected.

The third mediating factor that we had proposed, the coping strategies, had less impact than could have been expected. This may be due to the fact that we are dealing with a population that, even in the worst case (high affectation and low satisfaction with the aid) did not demonstrate any serious psychological problems. In any case, and in

the small number of cases in which this factor did introduce some significant difference between the groups of affected individuals, it did not do so in the foreseen direction. The groups that used an evasive strategy were those that obtained the highest scores. This is an extremely interesting piece of data which may possibly be related to the greater or lesser sentiment of controllability that the subjects may have had when faced with a certain situation: if controllability is low, as may be the case in a technological disaster, the approximative strategy may not be the most adaptive one.

By way of conclusion, it should be pointed out that the results of this study seem to question the universal, deterministic relation that is sometimes established between the occurrence of technological disasters and severe psychological damage among the affected population. The data seem to bear out the widely corroborated psychological thesis which affirms that the responses and reactions of subjects to different events are necessarily mediated by the manner in which those events are interpreted, and by the personal and community resources that are available to deal with them (Keane and Barlow, 2002). All these components interact in a specific way in each case, giving rise to the different casuistry that habitually appears in the presence of a single traumatic event (Echeburúa and Corral, 1995). For this reason, further research into the impact of these modulating factors is required, in order to incorporate them into protocols for action faced with this type of disaster.

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