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Post-traumatic stress disorders in the Nanai after the pollution of the Amur River: ethnocultural analysis --Manuscript Draft--

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Abstract:	<p>Subjects: Chemical pollution of the Amur River seriously damaged traditions and caused post-traumatic stress disorder (PTSD) among the Nanai, the indigenous people living along this river.</p> <p>Methods: The study group was randomly selected and included 75 male and 112 female volunteers. Severity of PTSD was measured using the Impact of Event Scale-Revised (IES-R) and Clinical-Administered PTSD Scale (CAPS). The scores were compared according to demographic and ethnocultural background, clinical examination, and ethnopsychological attitude toward the Amur River.</p> <p>Results: Around 42% (79/187 subjects) and 36% (67) had total IES-R (Total-I) score ≥ 34 and CAPS (Total-C) score ≥ 40. The participants grouped by place of residence, relation to other nationalities, psychopathological episodes in childhood, etc., showed significant differences in not only total but also each categorical score (Intrusion, Avoidance, and Hyperarousal). However, the effects of other parameters were not obvious, and logistic regression analysis was applied to compare the PTSD group with the non-PTSD group. Middle age, "friendly" family, "having children," etc., were extracted as risk factors, while "marriage," "friendly toward other nationalities," etc., were deemed to be protective factors. However, intimacy toward the Amur River was judged to be both a risk and a protective factor.</p> <p>Conclusion: The functions of extracted factors from general demographic and clinicopsychological situations were as expected. However, those from ethnocultural situations and relations toward the Amur River, which are specific factors for the indigenous Nanai, are still complex and difficult to interpret.</p>

1 Post-traumatic stress disorders in the Nanai after the pollution of the Amur River:
2 ethnocultural analysis

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12 Scale-Revision (IES-R), Clinical-administered PTSD Scale (CAPS), Ethno-cultural analysis

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25 Abstract

26 *Objectives:* Chemical pollution of the Amur River seriously damaged traditions and caused
27 post-traumatic stress disorder (PTSD) among the Nanai, the indigenous people living along
28 this river.

29 *Methods:* The study group was randomly selected and included 75 male and 112 female
30 volunteers. Severity of PTSD was measured using the Impact of Event Scale-Revised (IES-R)
31 and Clinical-Administered PTSD Scale (CAPS). The scores were compared according to
32 demographic and ethnocultural background, clinical examination, and ethnopsychological
33 attitude toward the Amur River.

34 *Results:* Around 42% (79/187 subjects) and 36% (67) had total IES-R (Total-I) score ≥ 34 and
35 CAPS (Total-C) score ≥ 40 . The participants grouped by place of residence, relation to other
36 nationalities, psychopathological episodes in childhood, etc., showed significant differences
37 in not only total but also each categorical score (Intrusion, Avoidance, and Hyperarousal).
38 However, the effects of other parameters were not obvious, and logistic regression analysis
39 was applied to compare the PTSD group with the non-PTSD group. Middle age, “friendly”
40 family, “having children,” etc., were extracted as risk factors, while “marriage,” “friendly
41 toward other nationalities,” etc., were deemed to be protective factors. However, intimacy
42 toward the Amur River was judged to be both a risk and a protective factor.

43 *Conclusion:* The functions of extracted factors from general demographic and
44 clinicopsychological situations were as expected. However, those from ethnocultural
45 situations and relations toward the Amur River, which are specific factors for the indigenous
46 Nanai, are still complex and difficult to interpret.

47

48 **Introduction**

49 More than two thirds of the general population may experience a significant traumatic event
50 at some point in their lives, and therefore traumatic experiences are relatively common [1].

51 Mass traumatic events usually involve many people and may result in a wide range of mental
52 and physical health consequences [2]. Personal care is required because such experiences are
53 unusual and unique for each individual [3, 4].

54 Nanai is a small population of indigenous people in the Russian Far East, living along the
55 middle reaches of the Amur River valley. Their culture and language include Tungusic
56 (Ewenki), aboriginal Nivkh, as well as Chinese-Manchu elements. They have their own
57 independent culture and live by fishing in the Amur River and hunting in the local forest. In
58 December 2005, an accident at a chemical factory caused the release of poisonous substances
59 into the Songhua River (Jilin, China), which polluted the Amur River in the Russian territory
60 [5]. This serious pollution of river water with benzene and nitrobenzene [6] resulted in the
61 prohibition on fishing, thus disrupting the way in which the Nanai obtain their staple food as
62 well as their traditional activities.

63 In addition, this population has always regarded the Amur River as part of their ethos,
64 symbolic culture, and inner world. They have a shamanistic religion with great reverence for
65 the bear and fire. They also believe that their ancestors originated from the Amur River,
66 which is also the guide to the world of spirits after death. These characteristic beliefs have led
67 to catastrophic effects in this case. The disaster started suddenly. However, pollutants settle to
68 the river bed and freeze into ice, and so their toxicities had prolonged stressful effects, leading
69 to chronic trauma, disadaptation, and powerlessness regarding the situation.

70 Environmental factors are potential sources of tense social situations and inducers of somatic
71 and mental pathologies, such as post-traumatic stress disorder (PTSD). Moreover, it has
72 already been documented that manmade/technological disasters may have different and more
73 marked consequences than natural disasters [1].

74 PTSD is the most commonly studied and probably the most frequent and debilitating
75 psychological disorder that occurs after traumatic events, disasters, and life-threatening events
76 [1, 3, 4]. PTSD is the only psychiatric disorder that has an etiological component, i.e.,
77 exposure to a traumatic event. According to the Diagnostic and Statistical Manual of Mental
78 Disorders, Fourth Edition (DSM-IV) [7], the diagnosis of PTSD requires three clusters of
79 symptoms, i.e., intrusion/reexperiencing of the event, avoidance/numbness, and hyperarousal
80 from exposure to traumatic events. On the other hand, there is increasing evidence suggesting
81 that PTSD is related not only to mental health impairment [8, 9] and social functioning [9-11]
82 but also to increased risk of somatic diseases [12-14] and overall mortality [15].
83 In the present study, to detect the special characteristics of PTSD of the indigenous Nanai
84 people after the disaster, the Impact of Event Scale-Revised (IES-R) and the Clinical-
85 Administered PTSD Scale (CAPS) were utilized to measure severity of PTSD associated with
86 demographic and ethnocultural background, clinical examination, and ethnopsychological
87 attitude toward the Amur River.

88 **Subjects and methods**

89 **Subjects**

90 The participants in this study were selected randomly and included 187 indigenous adult
91 Nanai volunteers over 18 years old (the age at which an individual does not require a guardian
92 according to the laws of the Russian Federation) from the general civilian population in the 8
93 villages of Nanai Regional District of Khabarovsk Regional Territory located in the Far East
94 of Russian Federation.

95 The field-type survey was performed by visiting the yards in residential areas of the
96 participants during the daytime (usually from 9 am to 6 pm). The survey was carried out
97 during winter and spring 2006 during the ecological catastrophe. Two medical doctors trained
98 in the specifics of PTSD research conducted the interviews under the supervision of the senior
99 interviewer. This study was conducted with all participants' written informed consent to all

100 procedures. The questionnaires were assigned ID numbers to protect the identities of the
101 participants. The study design was approved by the Ethical Committee of Kanazawa
102 University School of Medicine (Japan) and the Ethical Committee of Far Eastern State
103 Medical University (Russian Federation).

104 Self-administered questionnaire

105 We used a self-administered questionnaire consisting of four sections. The first was the
106 demographic section, which contained questions regarding gender, age, place of residence,
107 education level, profession, marital status, and housing condition. The second section
108 consisted of questions related to ethnocultural information, i.e., native language, relation to
109 own and other nationalities, relation to religion, confession, forms of religious rituals (for
110 believers), role playing of a married couple, domestic atmosphere, age hierarchy, number of
111 children, priority values, observance to national ceremonies (folk festivals, marriage, birth,
112 etc.), belief in national myths and omens, attitudes toward mental illness and suicide, and
113 preferred methods of medical treatment. The third section was related to clinical examination,
114 and included questions about psychopathological family history, psychopathological episodes
115 in childhood, predominant forms of response in stressful situations, anxiety, sphere of
116 psychotraumatic situation, manifestation of work disadaptation, manifestation of social
117 disadaptation, and level of somatic health. The fourth section of the questionnaire dealt with
118 ethnopsychological questions related to the Amur River and included information about
119 inhabiting fish, water pollution, sentiment toward the Amur River, and plans for the future.

120

121 PTSD examinations

122 All participants were asked to complete written questionnaires designed according to the
123 Russian-language certified version [16] of the Impact of Event Scale-Revision, IES-R [17]
124 and to have an interview according to the Clinical-administered PTSD Scale (CAPS) [18, 19]
125 for PTSD examination. All patients fulfilled Criterion A for the diagnosis of PTSD; i.e., they

126 had experienced an event that involved threatened death or serious injury to which they
127 responded with intense fear, helplessness, or horror.

128 *IES-R (Russian-language certified version)*

129 IES-R consists of 22 items based on self-reports measured on a 5-point Likert-type scale
130 ranging from 0 to 4 (not at all, rarely, sometimes, often, and always, respectively) and
131 identifies trends in prevalence of Intrusion/Reexperience (compulsion to repeat), Avoidance
132 of traumatic events and Hyperarousal (physiological excitability) that are included in the
133 diagnostic criteria of PTSD in DSM-IV [7]. The first category regarding symptoms of
134 Intrusion included nightmares, intrusive feelings, images or thoughts, flashbacks. The second
135 category regarded symptoms of Avoidance including attempts to mitigate or avoid
136 experiences associated with the traumatic event and reduced reactivity. The third category
137 involved Hyperarousal to physiological symptoms of irritability to describe the following
138 areas; anger and irritability, exaggerated startle response, difficulty in concentration,
139 psychophysiological arousal due to memories, and insomnia. Participants were presented with
140 three groups of questions, Intrusion (7 items), Avoidance (8 items), and Hyperarousal (7
141 items) that can be answered by the scheme of points 0, 1, 3, and 5 for the answer “no,”
142 “rarely,” “sometimes,” and “often,” respectively. Three subscale scores were obtained by
143 summing the relevant item scores and the total score was also obtained: score range, Intrusion
144 0 – 28, Avoidance 0 – 32, Hyperarousal 0 – 28, and Total 0 – 88. Several cut-off values were
145 reported to detect symptoms indicating a risk and/or vulnerability of PTSD. The mean IES-R
146 score for PTSD was 20, and a score of ≥ 20 on the IES-R was used to estimate the prevalence
147 of PTSD symptoms, with higher IES-R scores indicating more symptoms [8, 9]. The PTSD
148 high-risk group was also defined as those scoring 25 or higher, based on the screening results
149 [20, 21]. Individuals with a total IES-R score over 33 have been proposed to be regarded as a
150 “probable PTSD cases” [22]. However, the score can reach near 60 after torture [23].

151 *CAPS (Russian-language certified version)*

152 CAPS is a structured interview developed to diagnose and rate the severity of PTSD [18, 19].
153 It is comprised of 17 items to assess frequency and intensity of core symptoms of PTSD
154 determined by DSM-IV criteria evaluated by two medical doctors trained in the specifics of
155 PTSD research under the supervision of the senior interviewer. The 17 items can be classified
156 into three scales: Intrusion/Reexperience (4 items), reexperience of traumatic events in the
157 form of irritating thoughts, flashbacks, and distressing dreams; Avoidance (7 items),
158 avoidance of trauma-related thoughts and events, and restricted emotions; Hyperarousal (6
159 items), arousal such as sleep disorders, uneasiness, and hypervigilance. Participants were
160 presented with all questions that could be answered by the scheme scores for frequency and
161 intensity on a 5-point Likert-type scale. For answers of frequency: 0, none, 1, rarely (0% –
162 25% of the period), 2; sometimes (25% – 50%), 3; often (50% – 75%); and 4, always (>
163 75%). For answers of intensity: 0, no such feelings; 1, weak intensity of symptoms; 2,
164 moderate intensity; 3, high intensity; and 4, very high intensity. Estimation of severity scores
165 for each group and the total was made by summing the frequency and intensity ratings. The
166 score ranges were 0 – 16 for Intrusion, 0 – 32 for Avoidance, 0 – 28 for Hyperarousal, and 0 –
167 136 for Total. The total score was classified as follows: subclinical, 0 – 19; mild, 20 – 39;
168 moderate, 40 – 59; severe, 60 – 79; extreme, ≥ 80 [24].

169 Statistical analysis

170 The mean scores of each scale of IES-R and CAPS were compared between and among
171 groups divided by demographic characteristics using Student's *t* test and one-way ANOVA
172 with Tukey's HSD as a post hoc test. The relationships among each category of IES-R and
173 CAPS were analyzed by factor analysis. To examine factors that made IES-R and CAPS
174 scores high, logistic regression analysis was performed using the score and classification of
175 self-administered questionnaire as determinants. All analyses were performed with JMP 9.0.2
176 (SAS Institute Inc., Cary, NY).

177 **Results**

178 The means of total scores of IER-S and CAPS (respectively, Total-I and Total-C) for all
179 subjects were 31.5 ± 20.1 and 35.0 ± 16.2 , respectively (Table 1). Although scores of Total-I
180 and Total-C were significantly correlated, they were not identical. Around 42% (79 of 187)
181 and 36% (67) had Total-I score ≥ 34 and Total-C score ≥ 40 (Fig. 1).

182 To evaluate the relationships among symptoms available by these two tests, we utilized
183 principal factor analysis and three factors were extracted (Table 2). Factor 1 consisted of the
184 scores obtained by IES-R alone (Intrusion-I, Avoidance-I, and Hyperarousal-I), displaying a
185 very high total variance of 51%. Factor 2 was dependent on high scores of Avoidance and
186 Hyperarousal but not of Intrusion examined by CAPS (respectively, Avoidance-C,
187 Hyperarousal-C, and Intrusion-C), whereas factor 3 only included Intrusion-C. Their total
188 variances were 19% and 15%, respectively, and were not significantly different. IES-R and
189 CAPS had different definitions even when used to estimate similar symptoms and were useful
190 for estimating PTSD. Thus, we analyze which factors of general demographic, ethnocultural,
191 and clinicopsychological situations, and relations to the Amur River affected these differences
192 (Tables 1 and 3 – 5).

193 Although all the scores of age group “18 – 29” tended to be lower than those of other age
194 groups, the difference in Total-C between “18 – 29” and “30 – 39” alone was significant
195 (Table 1). The averages of all IER-S and CAPS scores of “settlement residents” were very
196 low and significantly different from those of “villagers.” Excluding these two differences,
197 dividing the groups by general demographic information did not show specific tendencies.

198 Next, we performed a comparison between groups divided according to ethnocultural
199 information (Table 3). “Inferior” feeling regarding their own nationality resulted in a
200 significantly higher Total-C than “equal” feeling. “Not tolerate” toward other nationalities
201 was usually associated with higher scores for all items compared to “friendly” and “tolerate,”
202 while only very high Total-C (48.7 ± 16.8) showed a significant difference. The data from
203 questions related to religion seemed not to be useful. For example, 120 participants answered

204 that they were “nonbelievers” but the number of those who expressed “religious beliefs” was
205 153. This contradiction was probably because it was prohibited to have religious beliefs
206 during the Soviet Union period. We omitted these categories from further analysis. The
207 groups divided according to information about family relations, such as dominant role in
208 spouse position, age hierarchy, domestic atmosphere, and having children or not, showed no
209 obvious effects. There were also no obvious effects among the groups divided according to
210 attitude toward ethnic customs, such as observance of national ceremonies and belief of
211 national myths and omens, or attitudes toward mental illness and suicide. Among the groups
212 divided by medical treatment preference, Total-C of “Western” was significantly lower than
213 that of “shamanism,” with low Avoidance-C and Hyperarousal-C.

214 With regard to clinical examination, the effects of psychopathological family history were
215 ambiguous but psychopathological episodes in childhood displayed obvious effects (Table 4).
216 Although episodes of organic-type disorders, such as enuresis, night terror, sleep walking,
217 etc., alone and those with affective type disorders, such as phobias, depressive reaction,
218 irritability, etc., alone had no obvious effects, their combination was associated with an
219 extremely high Total-C of 54.6 ± 11.6 due to very high Avoidance-C and Hyperarousal-C.

220 Those who had a “balanced” response to stressful situations tended to have lower means of all
221 IER-S and CAPS scores than those who reported different responses. However, significant
222 differences in Total-C were observed only against “expressive” and “self-aggressive.”
223 Regardless of whether it was significant or not, those who had “no” sphere of
224 psychotraumatic situation tended to have low scores. Especially, their Avoidance-C,
225 Hyperarousal-C, and Total-C were significantly lower than those with such spheres. Although
226 significances was observed only in CAPS scores, all of the scores of “always” for anxiety
227 were higher than those of “no” or “situational.” Those who manifested work disadaptation,
228 such as “underperformance” and “loss of rhythm,” had higher CAPS scores than those who
229 reported “none.” Especially, the mean Total-C of those who displayed “underperformance”

230 and “loss of rhythm” with “failure” reached 52.2 ± 13.5 . Their Total-I also reached $47.5 \pm$
231 25.0 . Among social disadaptation, “aggression” had high CAPS scores regardless of the
232 presence or absence of other disadaptations. In comparison with Avoidance-C and
233 Hyperarousal-C, these factors showed less effect on Intrusion-C. None of the scores were
234 different due to somatic health status.

235 Those who thought of fish in the Amur River as “neither basic nor important food” tended to
236 have lower IES-R and CAPS scores and their Intrusion-I, Intrusion-C, Hyperarousal-C, and
237 Total-C were significantly lower than those in the “basic and important food” group (Table
238 5). However, the effects of whether they really “eat” fish from the river or not were not
239 always obvious. Those who thought that this pollution was “not terrible” had significantly
240 lower IES-R and CAPS scores than those who accepted it as a “disaster.” The groups divided
241 by individual sentiment toward the Amur River had no significantly different scores
242 excluding Intrusion-C.

243 Logistic regression analysis was applied for the group possibly with PTSD having either
244 $Total-I \geq 34$ or $Total-C \geq 40$ ($n = 110$, approx. 60%) against the group possibly without PTSD
245 having $Total-I < 34$ and $Total-C < 40$ ($n = 77$, approx. 40%) (Table 6). As the presence of
246 anxiety and manifestation of work disadaptation seemed to have very high co-linearity with
247 PTSD judgment, they were removed from the determinants. Age groups “30 – 39” and “40 –
248 49” showed greater risk than other age groups. “Villagers” were at higher risk than
249 “settlement residents,” and “state house” than “own house” or “no house” groups. Higher
250 educational level seemed to be protective because the odds ratio of “secondary” over
251 “elementary” was 0.06 ($P = 0.02$) (Table 6) and “higher” over “elementary” 0.05 ($P = 0.07$)
252 (data not shown). Relations to other people was significant: “not married” was a risk
253 compared to “married” as well as “widowed/divorced” who were currently single. “Superior”
254 feeling regarding their own nationality compared to “inferior”; “friendly” feeling toward other
255 nationalities compared to other feelings; “parity” compared to alone; “spouse” compared to

256 “self”; “respect but not subordinate” compared to “subordinate”; age hierarchy; and “formal”
257 or “conflict” compared to “friendly” family relation were protective. Similarly, having “no”
258 children was protective compared to “yes.” In terms of priority values, however, “health” was
259 a greater potential risk than “family” as well as “profession” and “material well-being.”
260 “Public recognition” was a greater potential risk than the others. With regard to tradition, both
261 “observance of ceremonies” and “no observance of ceremonies” were risks compared to
262 “sometimes,” while medical treatment preference for “shamanism” was a risk compared to
263 “traditional” and “Western” medicine. Individual attitude to mental illness to be both
264 “civilized” and “superstitious” were risks compared to “uncertain,” and the existence of
265 psychopathological family history and episodes with “affective type” disorders in childhood
266 were potential risks compared to the other groups. To respond to stressful situations,
267 “balanced” was a higher risk than other attitudes. Recognition that “family” and “profession,”
268 but not “ecology,” created psychotraumatic situations was a risk factor. “Subclinical”
269 situation in somatic health was a risk but “existence” of somatic disorder was neither a risk
270 nor protective factor. Subjects who reported thinking of fish in the Amur River as “basic and
271 important” foods and that pollution of the Amur River was a “disaster” showed high risk, but
272 “eating fish” itself was protective compared to “not eating” fish. Although thinking of the
273 Amur River as “sacred” was a potential risk factor and thinking of the Amur River as a “way
274 of life,” either “source of income” or “source of food” was protective. Thinking of the Amur
275 River as a “gateway to ancestors/another world” was protective compared to thinking of the
276 Amur River as “just a river.” “No plan” to move was protective.

277 **Discussion**

278 IES-R has been used in various epidemiological studies to assess the prevalence of PTSD
279 [21]. CAPS is useful for estimating the frequency and intensity of individual
280 symptoms/disorders and their impact on social and production activities of patients [25]. Both
281 scales are commonly used [26] and seem to provide very important information regarding

282 people with PTSD risk and/or symptoms. CAPS results were reported to match those of self-
283 reported PTSD measures, particularly the IES, an original version of IES-R [27] produced by
284 Horowitz et al. [25]. IES-R is produced to be used with the DSM-IV symptomatology for
285 PTSD [17], and therefore IES-R and CAPS are comparable in terms of Intrusion, Avoidance,
286 Hyperarousal, and Total scores.

287 Their scores also show strong correlations and are available in PTSD research and treatment
288 [28, 29] but are not always identical [28 - 30]. Thus, the significance and relationship of each
289 category score and total score are not always apparent.

290 Factor analysis extracted 3 factors and confirmed that IES-R was different from CAPS
291 because factor 1 only consisted of IES-R. In CAPS, Avoidance/Hyperarousal-C were raised
292 by different background from Intrusion-C because factor 2 included Avoidance/Hyperarousal-
293 C but not Intrusion-C and factor 3 consisted of Intrusion-C alone. These findings suggested
294 that the differences in each category score should be considered more carefully.

295 The groups divided by general demographic conditions did not always show differences in
296 either IES-R or CAPS scores, and so the effects of “settlement resident” were difficult to
297 estimate.

298 When the groups were divided by ethnocultural and clinicopsychological situations as well as
299 relations to the Amur River, significant differences were more easily found in CAPS than in
300 IES-R. For example, the groups divided by relation to their own nationality and relations to
301 other nationalities showed significant differences only in CAPS scores. Moreover, significant
302 differences in Total-C tended to correspond to those in Avoidance-C and Hyperarousal-C but
303 not those in Intrusion-C. The definition of each category was different between IES-R and
304 CAPS, which was in good accordance with the results of factor analysis. In addition, for
305 comparison of averaged scores of divided groups, CAPS may be utilized more easily than
306 IES-R probably because the standard deviation of CAPS was narrower than that of IES-R.

307 High CAPS scores were associated with negative feelings toward both their own and other
308 nationalities, the existence of psychopathological episodes in childhood, and extroverted
309 reaction to stressful situations. It is natural that the existence of anxiety was associated with
310 high CAPS scores as well as manifestation of work and social disadaptation. Especially,
311 manifestation of work disadaptation caused not only high CAPS scores but also high IES-R
312 scores.

313 It is obvious that those who felt that this pollution was not terrible had a low risk of PTSD,
314 but the effects of intimacy toward the Amur River were not obvious. Thus, logistic regression
315 analysis was applied to extract risk and protective factors by removing confounding factors.

316 The middle-aged group was at higher risk than the younger and older groups, and it is
317 conceivable that those who had high responsibility to the society displayed higher risk. "State
318 house" itself was a risk and was one of the reasons why "villagers" were at elevated risk
319 because all state houses were in the village. Higher education seemed to be protective, and in
320 fact people engaged in "education" were at lower risk than those with other professions. This
321 pollution was caused by another nation, and so it was natural that maintaining a "friendly"
322 attitude toward other nationalities was protective.

323 Experience of "marriage," and "equal" or "partner's dominance" in spouse position were
324 protective but having "friendly" family and "having children" were risk factors. These
325 findings are not surprising because having a good relationship with a partner seems to be
326 supportive, but once they had family to be protected, this situation may represent a burden.

327 When priority values were estimated, "family" was protective compared to "health" and
328 "public recognition," and a risk factor compared to "profession." It is not surprising that
329 "health" was a potential risk factor. However, with regard to sphere of psychotraumatic
330 situation, both "family" and "profession" were recognized as risk factors. These findings may
331 have been because "family" and "profession" were recognized sometimes to be the same and
332 sometimes not the same. To have "public recognition" as a priority value was recognized as

333 the highest risk factor, which may be due to the same background where the “middle-aged
334 group” and some professions showed increased risk.

335 Relation to national customs was difficult to analyze as both “positive” and “negative” replies
336 regarding observance of national ceremonies were risk factors, “shamanism” alone was
337 extracted as a risk factor among medical preference, and superstition was not extracted. On
338 the other hand, it is conceivable that intimacy toward the Amur River was a very important
339 factor. Neglecting the importance of fish in the Amur River as food and the seriousness of
340 pollution, maintenance of dietary habits, and to continue living in this area were protective
341 factors. To feel that the Amur River is “sacred” or a “gateway to ancestors/another world”
342 displayed different importance. “Sacred” and “way of life” were potent risk and protective
343 factors, respectively, but “just a river” was associated with higher risk than “gateway.” The
344 discrepancy in the meaning of “sacred” and “gateway” should be analyzed by changing the
345 range of determinants.

346 It is not difficult to imagine the function of extracted factors from general demographic and
347 clinicopsychological situations, but those from ethnocultural situations and relations toward
348 the Amur River are more difficult. Especially, the effects of sentiment toward the Amur
349 River, which is a specific factor for indigenous Nanai people, are very complex and difficult
350 to interpret. To improve the current situation, we are planning to perform an immediate
351 follow-up investigation.

352

353 Conflict of interest

354 The authors declare that they have no conflict of interest.

355

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433

434 **Figure legend**

435 Fig. 1

436 Correlation of Total-I and Total-C. (R=0.45, P<0.0001).

Table 1 Comparison of IER-S and CAPS scores between/among groups divided according to the demographic characteristics

	No	Impact of Event Scale Revision (IES-R)				Clinical-Administered PTSD Scale (CAPS)									
		Intrusion	Avoidance	Hyperarousal	Total	Intrusion	Avoidance	Hyperarousal	Total						
gender															
female	112	12.3 ± 7.9	12.3 ± 8.6	9.2 ± 7.6	33.7 ± 22.0	6.6 ± 4.4	13.2 ± 8.2	16.3 ± 8.0	36.0 ± 16.1						
male	75	10.7 ± 6.6	10.3 ± 7.2	7.3 ± 5.5	28.3 ± 16.4	7.4 ± 5.8	12.4 ± 9.4	13.5 ± 6.4	a	33.4 ± 16.4					
age class															
18-29	52	9.8 ± 6.7	10.3 ± 8.1	7.0 ± 6.4	27.1 ± 19.7	4.7 ± 4.3	11.1 ± 9.0	13.7 ± 7.9	29.5 ± 16.5						
30-39	52	12.0 ± 7.9	13.0 ± 8.7	9.7 ± 8.2	34.7 ± 23.0	6.9 ± 4.3	14.9 ± 8.6	16.5 ± 7.1	38.3 ± 16.3						
40-49	37	12.7 ± 6.7	11.9 ± 7.6	7.8 ± 5.2	32.4 ± 15.5	7.0 ± 4.9	13.1 ± 7.9	15.8 ± 6.8	35.9 ± 13.8						
50-59	38	12.8 ± 7.6	10.9 ± 7.7	8.9 ± 6.3	32.6 ± 19.0	8.9 ± 5.2	b	11.9 ± 9.1	14.8 ± 8.6	35.6 ± 17.4					
≥60	8	11.1 ± 10.2	10.1 ± 7.8	9.6 ± 9.6	30.9 ± 26.6	11.3 ± 7.0	b	13.8 ± 8.5	15.5 ± 4.5	40.5 ± 12.3					
place of residence															
village	172	12.1 ± 7.4	11.8 ± 8.1	8.9 ± 7.0	32.8 ± 20.1	7.1 ± 5.1	13.6 ± 8.5	16.2 ± 6.9	36.9 ± 15.1						
settlement	15	5.7 ± 5.1	a	7.7 ± 7.1	3.2 ± 2.4	a	16.7 ± 13.4	a	4.7 ± 4.0	4.1 ± 5.3	a	4.0 ± 4.9	a	12.8 ± 12.0	a
housing															
own house	140	11.5 ± 0.6	10.8 ± 7.8	8.1 ± 6.8	30.4 ± 20.3	6.8 ± 5.1	12.2 ± 8.8	14.9 ± 7.5	33.9 ± 16.1						
state house	31	12.2 ± 6.2	13.9 ± 8.3	8.7 ± 6.4	34.8 ± 18.0	7.1 ± 4.2	15.8 ± 7.6	15.5 ± 7.1	38.5 ± 15.2						
no house	16	11.6 ± 1.9	12.9 ± 9.6	11.0 ± 8.2	35.5 ± 22.0	7.6 ± 5.5	12.8 ± 9.2	17.3 ± 8.4	37.6 ± 18.9						
marital status															
married	140	11.2 ± 7.5	11.3 ± 8.1	8.0 ± 6.5	30.5 ± 19.6	7.5 ± 5.2	12.5 ± 8.5	15.0 ± 7.9	35.1 ± 16.7						
not married	32	11.8 ± 6.5	11.8 ± 7.1	8.3 ± 6.5	31.9 ± 18.1	4.3 ± 3.8	b	13.7 ± 9.9	15.3 ± 5.9	33.3 ± 15.0					
widowed/divorced	15	15.1 ± 8.6	12.3 ± 10.1	12.6 ± 9.7	b	39.9 ± 27.1	6.8 ± 4.3	14.3 ± 8.3	16.3 ± 7.7	37.3 ± 14.9					
educational level															
primary	44	12.4 ± 7.3	12.6 ± 8.1	10.0 ± 7.6	35.0 ± 21.6	6.4 ± 5.0	12.4 ± 9.4	15.9 ± 7.7	34.7 ± 16.2						
secondary	113	11.6 ± 7.5	11.1 ± 8.1	8.3 ± 6.7	31.0 ± 19.8	7.2 ± 5.2	12.9 ± 8.6	15.4 ± 7.3	35.4 ± 16.4						
higher	30	10.7 ± 7.6	11.1 ± 8.1	6.6 ± 6.1	28.4 ± 18.9	6.6 ± 4.3	13.5 ± 8.4	13.4 ± 8.1	33.5 ± 16.0						
profession															
business	14	11.1 ± 8.1	10.4 ± 7.7	7.1 ± 5.4	28.7 ± 18.3	6.4 ± 4.2	10.4 ± 8.5	13.9 ± 6.6	30.6 ± 14.3						
culture	13	10.7 ± 6.9	11.8 ± 9.1	7.3 ± 6.3	29.8 ± 20.3	7.3 ± 3.2	9.9 ± 6.3	15.4 ± 6.9	32.6 ± 12.4						
education	39	11.5 ± 7.3	12.2 ± 8.1	8.2 ± 6.9	31.9 ± 19.7	6.9 ± 4.9	12.4 ± 8.3	15.5 ± 8.2	34.8 ± 16.6						
fishery	13	10.4 ± 8.6	7.1 ± 6.7	6.3 ± 6.5	23.8 ± 18.8	4.8 ± 4.1	11.7 ± 8.7	12.0 ± 8.6	28.5 ± 19.0						
health	16	12.6 ± 5.1	11.3 ± 6.2	8.9 ± 4.9	32.8 ± 12.7	8.3 ± 4.3	12.4 ± 5.6	14.0 ± 6.6	34.6 ± 12.1						
industry	23	10.3 ± 6.8	11.0 ± 7.6	6.9 ± 6.5	28.2 ± 19.1	7.0 ± 5.1	13.7 ± 8.2	14.8 ± 7.1	35.5 ± 15.2						
transportation	7	8.9 ± 6.6	8.1 ± 8.6	7.0 ± 6.9	24.0 ± 21.0	7.9 ± 8.2	9.7 ± 9.0	9.9 ± 6.8	27.4 ± 19.3						
others	14	13.1 ± 7.7	10.4 ± 7.7	6.6 ± 5.0	30.1 ± 18.0	6.2 ± 5.0	16.9 ± 12.3	14.3 ± 6.4	37.4 ± 19.1						
not working	48	12.8 ± 8.3	13.4 ± 9.0	11.1 ± 8.2	37.3 ± 23.6	7.1 ± 5.7	14.1 ± 9.3	17.7 ± 7.6	38.9 ± 16.8						

The values represent the mean ± SD. Significant difference, a; between groups (P<0.05, Students' t-test), and b; from the first group (P<0.05, one-way ANOVA with Tukey's HSD as a post hoc test).

Table 2 Principal factor analysis for the scores of PTSD symptoms examined by IES-R and CAPS

	Factor 1	Factor 2	Factor 3
IES-R			
Intrusion	0.85	-0.00	0.17
Avoidance	0.93	-0.02	-0.12
Hyperarousal	0.88	0.07	0.03
CAPS			
Intrusion	-0.00	0.00	0.99
Avoidance	-0.08	0.95	-0.07
Hyperarousal	0.06	0.83	0.09
Eigen value	3.04	1.13	0.89
% total variance	0.51	0.19	0.15

The values represent after factor analysis with Varimax rotation ($P < 0.0001$).

Table 4 Comparison of IER-S and CAPS scores between/among groups divided according to the information about clinical examination

	No	Impact of Event Scale Revision (IES-R)				Clinical-Administered PTSD Scale (CAPS)				
		Intrusion	Avoidance	Hyperarousal	Total	Intrusion	Avoidance	Hyperarousal	Total	
psychopathological family history										
none	125	11.4 ± 7.3	11.0 ± 7.7	8.2 ± 6.8	30.7 ± 19.5	7.0 ± 5.2	12.4 ± 8.4	15.7 ± 7.2	35.1 ± 15.8	
yes	24	12.7 ± 8.3	13.3 ± 10.1	10.4 ± 8.4	36.4 ± 24.6	5.7 ± 4.4	16.4 ± 10.4	15.8 ± 7.7	37.9 ± 16.7	
alcoholism	38	11.6 ± 7.5	11.8 ± 8.1	7.9 ± 6.2	31.3 ± 18.9	7.3 ± 4.6	12.1 ± 8.3	13.2 ± 8.4	32.6 ± 17.3	
psychopathological episodes in childhood										
none	137	11.7 ± 7.7	11.2 ± 8.1	8.2 ± 7.0	31.2 ± 20.7	6.8 ± 4.9	12.2 ± 8.6	14.1 ± 7.2	33.1 ± 15.6	
organic type	22	11.6 ± 6.4	12.9 ± 9.2	9.4 ± 6.6	33.9 ± 20.2	7.5 ± 5.0	13.5 ± 7.1	16.6 ± 7.1	37.6 ± 15.1	
affective type	20	9.9 ± 7.1	11.3 ± 7.9	7.7 ± 6.2	28.9 ± 17.3	7.3 ± 5.8	12.4 ± 9.0	17.1 ± 7.7	36.8 ± 18.2	
both	8	14.5 ± 6.0	12.8 ± 6.3	10.5 ± 8.5	37.8 ± 17.5	7.3 ± 5.5	22.9 ± 8.7	24.5 ± 7.2	54.6 ± 11.6	b,c,d
predominant forms of response in stressful situations										
balanced	33	9.8 ± 6.8	8.7 ± 6.8	6.3 ± 5.3	24.8 ± 16.0	6.9 ± 5.3	8.8 ± 9.1	10.2 ± 7.4	25.9 ± 16.3	
autistic	22	11.1 ± 8.1	12.3 ± 8.0	8.5 ± 8.0	31.9 ± 22.8	7.3 ± 5.4	14.5 ± 10.4	14.7 ± 8.8	36.5 ± 20.2	
expressive	60	11.9 ± 8.3	11.9 ± 9.1	8.1 ± 6.7	31.8 ± 21.7	7.2 ± 4.8	12.2 ± 7.5	16.5 ± 6.5	35.9 ± 14.0	b
self-aggressive	72	12.4 ± 6.7	12.2 ± 7.6	9.7 ± 7.2	34.3 ± 19.2	6.5 ± 5.0	14.8 ± 8.4	16.5 ± 7.1	37.8 ± 15.5	b
sphere of psycho-traumatic situation										
family	72	13.3 ± 7.3	13.2 ± 8.9	10.3 ± 7.0	36.8 ± 20.7	6.6 ± 4.5	14.5 ± 7.9	17.4 ± 7.3	38.4 ± 14.2	
profession	43	10.0 ± 6.7	10.0 ± 7.4	6.7 ± 6.2	26.8 ± 18.0	6.0 ± 5.5	14.0 ± 8.3	16.5 ± 5.6	36.4 ± 14.3	
both	11	11.9 ± 9.1	12.8 ± 9.1	9.0 ± 9.8	33.7 ± 26.7	7.7 ± 5.4	15.6 ± 7.1	18.2 ± 7.7	41.5 ± 16.9	e
ecology	38	12.5 ± 8.0	10.5 ± 7.3	8.6 ± 7.0	31.7 ± 19.7	9.2 ± 4.9	11.2 ± 9.2	13.4 ± 6.9	33.9 ± 16.5	c
none	23	7.6 ± 5.5	9.9 ± 6.9	5.1 ± 4.0	22.6 ± 14.9	5.7 ± 4.9	7.1 ± 9.4	7.1 ± 6.6	19.9 ± 17.1	b,c,d,e
presence of anxiety										
absent	26	10.4 ± 7.1	9.9 ± 7.2	7.2 ± 6.5	27.5 ± 19.0	5.0 ± 4.9	10.5 ± 12.0	11.5 ± 8.2	26.9 ± 20.3	
situational	123	11.3 ± 7.0	11.6 ± 7.6	8.2 ± 6.5	31.1 ± 18.7	6.9 ± 4.8	12.7 ± 7.6	15.1 ± 6.5	34.7 ± 13.7	
always	38	13.4 ± 8.8	12.2 ± 10.2	10.0 ± 8.2	35.7 ± 24.6	8.3 ± 5.5	14.9 ± 9.1	18.0 ± 9.1	41.2 ± 18.4	b
manifestation of work disadaptation										
none	110	11.3 ± 7.4	11.3 ± 7.8	8.3 ± 6.7	30.9 ± 19.4	6.4 ± 4.9	9.9 ± 7.7	12.6 ± 7.1	28.9 ± 14.3	
underperformance	15	9.8 ± 7.3	11.4 ± 10.9	6.9 ± 7.1	28.1 ± 24.4	8.1 ± 4.8	15.7 ± 8.1	20.0 ± 8.8	43.7 ± 16.7	b
loss of rhythm	23	9.4 ± 5.5	8.7 ± 4.9	6.4 ± 4.7	24.6 ± 13.7	5.4 ± 4.0	16.4 ± 8.8	19.5 ± 5.2	41.3 ± 14.9	b
both	18	12.3 ± 7.9	13.9 ± 10.5	7.3 ± 6.7	33.6 ± 22.5	7.2 ± 4.8	16.4 ± 7.1	15.8 ± 7.1	39.4 ± 13.5	b
both+failure	11	17.5 ± 8.8	15.7 ± 8.9	14.4 ± 9.4	47.5 ± 25.0	11.9 ± 6.9	19.8 ± 8.6	20.5 ± 4.8	52.2 ± 13.5	b,d
others	10	15.8 ± 6.4	10.7 ± 5.7	11.4 ± 7.0	37.9 ± 14.5	8.5 ± 3.8	19.0 ± 9.8	19.0 ± 5.9	46.5 ± 14.9	b
manifestation of social disadaptation										
none	69	11.6 ± 7.3	10.8 ± 7.7	6.3 ± 0.8	30.5 ± 18.7	6.8 ± 4.8	8.8 ± 7.5	11.2 ± 6.7	26.8 ± 14.1	
loss of interest (i)	16	10.7 ± 7.0	9.3 ± 6.9	6.1 ± 1.5	27.0 ± 18.6	5.4 ± 5.0	12.3 ± 9.5	12.7 ± 7.0	30.3 ± 19.2	
aggression (a)	30	9.4 ± 5.8	10.1 ± 6.5	6.5 ± 1.2	26.8 ± 17.1	8.5 ± 5.9	13.9 ± 8.3	18.7 ± 5.3	41.0 ± 14.7	b
antisocial behavior	14	14.8 ± 8.4	16.5 ± 8.9	9.2 ± 2.5	43.9 ± 24.4	6.8 ± 6.0	17.6 ± 9.6	17.2 ± 7.0	41.6 ± 17.3	
mysticism (m)	6	10.7 ± 5.8	11.7 ± 6.5	5.5 ± 2.3	31.0 ± 15.8	5.0 ± 4.1	13.5 ± 3.3	13.3 ± 4.7	31.8 ± 7.9	
i+a	20	10.3 ± 8.3	12.1 ± 10.1	7.4 ± 1.7	30.0 ± 24.2	7.6 ± 4.0	14.4 ± 8.0	18.6 ± 8.7	40.6 ± 15.2	b
i+m	11	13.0 ± 9.5	11.1 ± 9.4	8.2 ± 2.5	33.0 ± 24.4	4.1 ± 3.8	15.6 ± 8.8	19.2 ± 8.8	38.9 ± 14.8	b
a+m	7	16.7 ± 8.8	17.0 ± 9.6	6.4 ± 2.4	44.7 ± 16.7	5.3 ± 2.6	18.4 ± 7.4	19.7 ± 3.5	43.4 ± 7.9	b
I+a+m	14	13.5 ± 6.7	11.8 ± 8.5	7.3 ± 1.9	34.3 ± 20.0	8.7 ± 5.4	19.0 ± 8.7	18.9 ± 5.7	46.6 ± 14.4	b
somatic health										
healthy	91	11.5 ± 7.8	11.1 ± 7.9	8.5 ± 7.1	31.2 ± 20.8	6.4 ± 4.8	12.3 ± 8.8	14.8 ± 8.0	33.5 ± 16.9	
subclinical	80	12.1 ± 7.1	11.8 ± 8.6	8.5 ± 7.0	32.4 ± 20.0	7.6 ± 5.4	14.0 ± 8.8	15.9 ± 7.0	37.4 ± 15.4	
disorder	16	10.1 ± 6.9	11.8 ± 6.7	7.6 ± 5.1	29.4 ± 16.8	6.3 ± 4.3	10.6 ± 7.2	13.9 ± 7.2	30.7 ± 15.4	

The values represent the mean ± SD. Significant difference, a; between groups (P<0.05, Students' t-test), and b; from the first group, c; from the second group, d; from the third group, and e; from the fourth group. (P<0.05, one-way ANOVA with Tuckyr's HSD as a post hoc test).

Table 5 Comparizon of IER-S and CAPS scores between/among groups divided acording to the ethno-psychological questions

	No	Impact of Event Scale Revision (IES-R)				Clinical-Administered PTSD Scale (CAPS)			
		Intrusion	Avoidance	Hyperarousal	Total	Intrusion	Avoidance	Hyperarousal	Total
As a food, fish caught in the Amur River is									
basic and important	60	13.8 ± 7.5	13.1 ± 8.8	9.7 ± 7.2	36.5 ± 21.2	8.2 ± 5.6	13.9 ± 9.1	16.7 ± 6.2	38.7 ± 15.4
not basic but important	95	11.1 ± 6.9	11.0 ± 7.4	7.9 ± 6.3	30.0 ± 18.2	6.6 ± 4.8	12.7 ± 8.4	15.2 ± 8.0	34.5 ± 16.2
neither basic nor importan	32	9.3 ± 8.1	10.0 ± 8.5	7.5 ± 7.8	26.8 ± 21.8	5.5 ± 4.0	11.5 ± 8.9	12.2 ± 7.5	29.2 ± 16.3
Fish inhabiting the Amur River is seriously suffered									
no	21	13.2 ± 8.7	11.3 ± 9.0	10.2 ± 7.7	34.8 ± 23.8	6.9 ± 4.5	13.0 ± 9.9	15.9 ± 6.7	35.9 ± 18.1
yes	166	11.4 ± 7.3	11.5 ± 8.0	8.2 ± 6.8	31.1 ± 19.6	6.9 ± 5.1	12.8 ± 8.6	15.1 ± 7.6	34.8 ± 16.0
After the pollution, do you eat fish in the Amur River?									
no	56	11.3 ± 8.0	11.9 ± 8.7	8.7 ± 7.9	31.9 ± 22.3	8.0 ± 5.7	11.6 ± 10.2	12.8 ± 8.1	32.4 ± 19.7
yes	102	11.3 ± 7.2	10.6 ± 7.7	7.7 ± 6.1	29.6 ± 18.7	6.2 ± 4.9	13.0 ± 7.8	15.7 ± 7.1	35.0 ± 14.6
in the future, yes	29	13.5 ± 7.1	13.8 ± 8.1	10.5 ± 7.2	37.9 ± 19.5	7.3 ± 3.4	14.7 ± 8.4	17.7 ± 6.9	39.8 ± 13.7
Water pollution in the Amur River is									
disaster	172	12.1 ± 7.4	11.9 ± 8.2	8.7 ± 7.0	32.7 ± 20.1	7.1 ± 5.0	13.6 ± 8.6	15.8 ± 7.3	36.5 ± 15.6
not terrible	15	6.3 ± 5.2	6.9 ± 5.3	4.7 ± 4.6	17.9 ± 13.7	4.3 ± 4.1	4.8 ± 5.0	8.1 ± 6.6	17.2 ± 11.9
The Amur River for me is									
sacred (s)	16	13.6 ± 6.2	14.4 ± 8.8	10.2 ± 7.6	38.3 ± 18.7	9.6 ± 5.4	12.9 ± 9.9	13.4 ± 9.1	35.8 ± 20.2
gateway to the ancestor									
/another world (g)	26	9.7 ± 7.2	11.2 ± 8.1	9.0 ± 7.3	29.9 ± 21.2	5.3 ± 4.2	11.8 ± 8.2	13.4 ± 7.2	30.5 ± 17.1
way of life (w)	56	12.2 ± 7.4	12.0 ± 8.6	8.5 ± 6.5	32.7 ± 20.8	6.7 ± 5.3	14.3 ± 8.1	15.9 ± 6.0	36.9 ± 13.1
just the river	62	10.3 ± 7.4	11.0 ± 7.8	7.5 ± 6.8	28.7 ± 19.6	5.6 ± 4.1	12.4 ± 9.1	16.3 ± 8.1	34.3 ± 16.5
s+g	6	17.3 ± 10.2	11.5 ± 6.9	12.3 ± 10.2	41.2 ± 25.2	10.5 ± 5.0	14.0 ± 7.4	14.3 ± 9.2	38.8 ± 18.5
s+w	4	13.5 ± 9.3	11.3 ± 8.2	7.0 ± 7.7	31.8 ± 24.1	8.5 ± 8.1	14.0 ± 17.4	15.0 ± 6.1	37.5 ± 30.0
g+w	9	11.4 ± 4.6	8.4 ± 6.5	6.8 ± 4.7	26.7 ± 11.7	9.8 ± 5.1	11.3 ± 6.4	13.0 ± 7.2	34.1 ± 13.0
s+g+w	8	15.3 ± 8.5	10.3 ± 9.1	9.3 ± 6.6	34.8 ± 21.9	11.4 ± 4.0	10.4 ± 8.7	13.9 ± 10.5	35.6 ± 19.8
Movement									
planning	16	12.2 ± 7.9	14.0 ± 8.1	9.4 ± 8.3	35.6 ± 22.2	3.9 ± 4.1	14.6 ± 9.6	16.4 ± 6.9	34.9 ± 14.9
not planning	171	11.6 ± 7.4	11.3 ± 8.1	8.3 ± 6.8	31.2 ± 19.9	7.2 ± 5.0	12.7 ± 8.6	15.1 ± 7.6	34.9 ± 16.4

The values represent the mean ± SD. Significant difference, a; between groups (P<0.05, Students' t-test), and b; from the first group, c; from the second group, and e; from the fourth group (P<0.05. one-wav ANOVA with Tuckv's HSD as a post hoc test).

Table 6. Logistic regression analysis exploring risk and protective factor against PTSD

	reference	comparizon	odds	P	95% CI
age class	18-29	30-39	148.36	0.00	7.53 - 10075.55
	18-29	40-49	136.49	0.01	2.75 - 20391.67
	30-39	50-59	0.03	0.02	0.00 - 0.65
	30-39	≥60	0.00	0.02	0.00 - 0.27
	40-49	50-59	0.03	0.04	0.00 - 0.88
	40-49	≥60	0.00	0.02	0.00 - 0.22
place of residence housing	village	settlement	0.00	0.00	0.00 - 0.04
	state house	own house	0.03	0.01	0.00 - 0.52
marrital status	state house	no house	0.00	0.00	0.00 - 0.09
	not married	married	0.00	0.00	0.00 - 0.00
education	not married	divorced/widowed	0.00	0.00	0.00 - 0.00
	primary	secondary	0.06	0.02	0.00 - 0.63
profession	buisness	education	0.01	0.03	0.00 - 0.59
	buisness	not working	0.01	0.04	0.00 - 0.83
	culture	education	0.03	0.04	0.00 - 0.79
	industry	education	0.01	0.01	0.00 - 0.40
	civil service	education	0.01	0.02	0.00 - 0.47
	inferior	superior	0.01	0.05	0.00 - 0.99
	intolerable	friendly	0.01	0.03	0.00 - 0.61
relation to own nationalities	tolerable	friendly	0.01	0.00	0.00 - 0.17
	self	equal	0.00	0.00	0.00 - 0.00
relation to other nationalities	self	partner	0.01	0.00	0.00 - 0.20
	self	others	0.00	0.00	0.00 - 0.06
	partner	equal	0.00	0.00	0.00 - 0.09
age hierarchy family relation	subordinate	respect but not subordinate	0.00	0.00	0.00 - 0.05
	friendly	formal	0.00	0.00	0.00 - 0.00
	friendly	conflict	0.03	0.00	0.00 - 0.32
children priority values	conflict	formal	0.00	0.00	0.00 - 0.00
	yes	no	0.00	0.00	0.00 - 0.06
	health	family	0.02	0.00	0.00 - 0.29
	health	profession	0.00	0.00	0.00 - 0.00
	health	material well-being	0.04	0.01	0.00 - 0.48
	material well-being	profession	0.00	0.00	0.00 - 0.00
	family	profession	0.00	0.00	0.00 - 0.00
	public recognition	family	0.00	0.00	0.00 - 0.00
	public recognition	profession	0.00	0.00	0.00 - 0.00
	public recognition	health	0.00	0.00	0.00 - 0.06
observance to national ceremonies	public recognition	material well-being	0.00	0.00	0.00 - 0.00
	positive	sometimes	0.00	0.00	0.00 - 0.11
	negative	sumetimes	0.02	0.00	0.00 - 0.25
preferential medical method	shamanism	traditional	0.03	0.01	0.00 - 0.51
	shamanism	Western	0.01	0.00	0.00 - 0.20
Atitude to mental illness	civilized	uncertain	0.03	0.00	0.00 - 0.34
	superstitious	uncertain	0.01	0.03	0.00 - 0.65
psychopathological family history	yes	no	0.00	0.00	0.00 - 0.02
	yes	alcoholism	0.00	0.00	0.00 - 0.01
psychopathological episodes in childhood	organic type	none	68.67	0.01	2.27 - 5015.01
	affective type	organic type	0.01	0.01	0.00 - 0.31
	both	none	0.00	0.00	0.00 - 0.00
	both	organic type	0.00	0.00	0.00 - 0.00
form of response in stress situation	balanced	expressive	0.00	0.00	0.00 - 0.07
	balanced	self-aggression	0.00	0.00	0.00 - 0.02
	balanced	autistic	0.00	0.00	0.00 - 0.10
sphere of psycho-traumatic situation	family	identify difficult	0.01	0.02	0.00 - 0.47
	profession	identify difficult	0.01	0.01	0.00 - 0.34
	both	ecology	0.01	0.04	0.00 - 0.83
	both	identify difficult	0.00	0.01	0.00 - 0.27
	healthy	subclinical	96.34	0.00	6.14 - 3611.87
somatic health fish in the Amur River is food	basic and important	not basic but important	0.00	0.00	0.00 - 0.05
	not basic but improtant	neither basic nor important	0.01	0.03	0.00 - 0.63
eat fish in the Amur River after water pollution pollution in the AmurRiver is the Amur River for me is	no	eating	0.06	0.04	0.00 - 0.92
	disaster	not always	0.01	0.00	0.00 - 0.15
	sacred (s)	gateway (g)	0.00	0.00	0.00 - 0.03
	sacred (s)	way of life (w)	0.00	0.00	0.00 - 0.06
	sacred (s)	just the river (j)	0.00	0.00	0.00 - 0.18
	sacred (s)	g+w	0.00	0.04	0.00 - 0.71
	sacred (s)	s+g+w	0.00	0.00	0.00 - 0.04
	gateway (g)	just the river (j)	28.91	0.04	1.01 - 1714.87
	s+g	gateway (g)	0.00	0.00	0.00 - 0.00
	s+g	way of life (w)	0.00	0.00	0.00 - 0.00
	s+g	s+w	0.00	0.01	0.00 - 0.04
	s+g	g+w	0.00	0.01	0.00 - 0.04
	s+g	s+g+w	0.00	0.00	0.00 - 0.00
	s+g	just the river (j)	0.00	0.00	0.00 - 0.01
	movemnet	planning	not planning	0.02	0.03

The group with either ≥34 Total-I or ≥40 Total-C (n=110, approx. 60%) was compared against the group having <34 Total-I and <40 Total-C (n=77, approx. 40%).

No factor was extracted form gender, native language, superstition, attitude to suicide, and fish in the Amur was polluted.

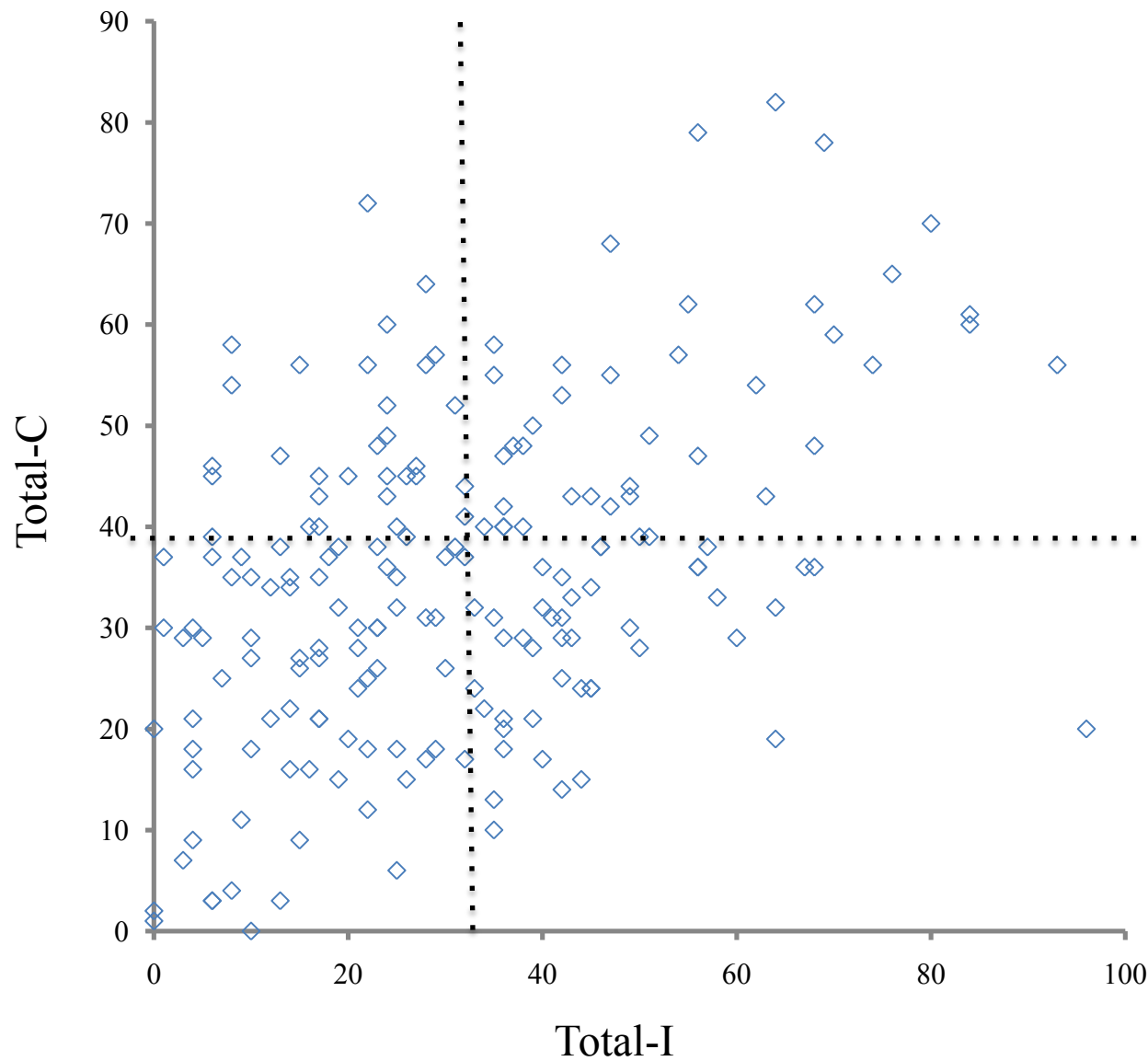


Figure 1