

Reliability of the Hebrew Version of the Integrated Covid-19 Threat Scale

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ABSTRACT

Background: The COVID-19 global pandemic of 2020 brought about a surge of psychological research focusing on its cognitive and emotional impact. In a recent study, Kachanoff et al. (1) published the Integrated Covid-19 Threat Scale – a 10-item scale for measuring the perceived symbolic and realistic threats of COVID-19. In their study Kachanoff et al. examined the reliability of this scale on a total of 1,142 participants who were tested in three separate experiments at the beginning of the outbreak in the U.S. between March 19-28, 2020.

Methods: We have translated this scale into Hebrew and adapted it to Israeli participants. This Hebrew version of the scale was conducted with 492 Israeli participants who were tested a month later, between April 11-19, 2020. Here we publish the Hebrew version of the scale and report its internal and external reliability.

Results: Our findings show that the Hebrew version of the scale is internally reliable and also externally reliable when compared to the GAD-7 anxiety scale. Additionally, in our sample we found a lower perception of threat than the findings of Kachanoff et al. Surprisingly, we found no difference between people who are at risk for COVID-19 and people who are not at risk.

Conclusions: We conclude that the Hebrew and adaption of the scale is reliable and could be used in COVID-19 related psychological research conducted among Hebrew speaking participants in Israel. We discuss potential interpretations of the differences in perception of threat between Israeli and American populations and provide a potential explanation for why there was no effect of risk on the perception of threat.

INTRODUCTION

The COVID-19 global pandemic of 2020 brought about a surge of psychological research focusing on its cognitive and emotional impact (2-4). One aspect that is common to many of these studies is their interest in measuring and quantifying the amount of emotional distress caused by this crisis and specifically the amount of perceived threat of the disease and its national and personal consequences.

In a recent study Kachanoff et al. (1) published the Integrated Covid-19 Threat Scale – a 10-item scale for measuring the perceived threat of COVID-19. The scale was tested among 1,142 participants from all over the U.S., approached through Amazon's online platform Mturk. The study was conducted between March 19-28, 2020, during which the number of coronavirus cases in the U.S. rose from about 10,442 to 85,228, and the virus appeared in almost all of the states.

For each of the 10 items of the Integrated Covid-19 Threat Scale, participants were requested to rate how much threat, if any, they perceived the coronavirus outbreak to be for this item. Rating was done on a scale from 1 ("Not a Threat") to 4 ("Major Threat"). Some of the items on the scale represented realistic threats – i.e., concrete attack on physical and material well-being; whereas other items represented symbolic threats – an assault on cultural and national identity (1, 5-7). It was suggested by Kachanoff et al. (1) that both types of threats were likely to increase psychological distress and may predict behaviors differentially. The realistic threat items are universal and apply to Israel as the U.S. The symbolic threat items reflect basic values of western society, such as democracy, rights and freedom, as well as some universal values such as preserving one's identity and maintaining law and order. These values apply to Israel similarly to

the U.S., and some of them were explicitly suggested to be violated during COVID-19 crisis. For example, surveillance technologies employed to track confirmed patients in Israel triggered a heated discussion on freedom and personal rights (item 1) (8). The curfew imposed of the entire country on the first night of Passover (seder night), which is considered an important holiday in Jewish tradition celebrated by most of the population in Israel, probably triggered emotions of threat to traditions and values (item 3). Finally, the COVID-19 crisis and the way it is handled by the Israeli government was frequently suggested by the press to be a threat to democracy in Israel (item 4) (e.g., 9, 10).

The Integrated Covid-19 Threat Scale is in English and its items are specifically phrased to target North American participants. It includes items such as “what does it mean to be American” and “American values and traditions” which need to be adapted to be used in other countries and cultures. As part of a study on cognition and emotion during the COVID-19 crisis, we translated the Integrated Covid-19 Threat Scale into Hebrew and adapted it to Israeli participants (e.g., by changing “what does it mean to be American” to “Israeli identity”). Here we report internal and external reliability of the Hebrew version of this scale and compare them to the original version. Additionally, we used the scale to examine whether threat perception is affected by an objective health threat. This was done by comparing scores of people who are at high risk for COVID-19 (due to age or background health issues) with people who are not at high risk (young and healthy). We predict that people who are at a risk, and whose objective threat is higher, would also perceive the realistic threat as higher and that this would be indicated by higher scores on the realistic scale.

METHODS

Participants. We recruited 598 Israeli adult participants as part of a larger scale online study on cognition and emotion during the COVID-19 crisis. Following pre-determined exclusions (online preregistration at <https://osf.io/3kzve>), 492 participants were included in the study (258 females, ages 18-96, M: 41.15, SD: 14.64). Participation was either voluntary through a shared link on our lab Facebook page (57 participants) or for a small payment (435 participants). Paid participants were recruited online through the Israeli internet surveys company Panel4All. Participation was completely anonymous and participants were asked to consent by pressing a key at the beginning

of the questionnaire. The study was approved by the ethical committee of Tel Aviv University.

Time of study. The study was conducted between the April 11-19, 2020, during the coronavirus outbreak. During this time, the total number of COVID-19 related deaths in Israel increased from 101 (on April 11) to 172 (April 19). The number of diagnosed cases at this period increased from 10,743 to 13,491. Israel was at the time under a partial lockdown limiting non-essential travel to no more than 100 meters from residence. School, universities and childcare facilities were closed, and business was limited to the essential. Unemployment rate in Israel reached around 25% at that time.

Risk assessment. Participants were also requested to indicate whether they consider themselves to be at a risk-group for the coronavirus.

The Hebrew Version of the Integrated Covid-19 Threat Scale. Like the original scale, the Hebrew version includes 10 items describing entities which could be potentially threatened by the COVID-19 crisis (see Table 1 for the list of items). Participants were requested to rate how much threat, if any, they perceived the coronavirus outbreak to be for each one of these items. Rating was done on a scale from 1 (“Not a Threat”) to 4 (“Major Threat”). The first five statements of the questionnaire refer to symbolic threats to one’s socio-cultural identity (national rights and freedom, national identity, national values and traditions, democracy and the maintenance of law and order). The last five statements refer to realistic threats to physical or financial safety (personal health, national health, personal financial safety, national economy and day-to-day life in

Table 1. Original questionnaire and the Hebrew translation

How much threat, if any, is the coronavirus outbreak for...		עד כמה, אם בכלל, התפרצות וירוס הקורונה מהווה לדעתך איום על הדברים הבאים?
The right and freedoms of the U.S. population as a whole	1	הזכויות והחופש של כלל אוכלוסיית ישראל
What it means to be American	2	הזהות הישראלית
American values and traditions	3	ערכים ומסורות ישראליות
American democracy	4	הדמוקרטיה הישראלית
The maintenance of law and order in America	5	השמירה על החוק והסדר בישראל
Your personal health	6	הבריאות האישית שלי
The health of the U.S. population as a whole	7	הבריאות של כלל האוכלוסייה בישראל
Your personal financial safety	8	הביטחון הכלכלי שלי
The U.S. economy	9	כלכלת ישראל
Day-today life in your local community	10	חיי היומיום בקהילה המקומית שלי

the local community). The questionnaire was translated to Hebrew and was checked in a back-translation process. The Hebrew translation included a few adaptations. All statements that originally referred to the American society and values were rephrased to refer to Israel. The second statement, originally referring to a possible threat to “what it means to be American,” was modified in the Hebrew version to “the Israeli identity.” Table 1 depicts the items.

Anxiety scale. We used a Hebrew version of the Generalized Anxiety Disorder 7-Item Scale (GAD-7), developed by Spitzer et al. (11), which was found to have a high value of reliability and validity (12). Participants were requested to rate on a scale of 0 (“Not at all”) to 3 (“Almost every day”) how often they were troubled by each of the scale’s seven items in the past two weeks.

Analysis. Scores of the Hebrew Version of the Integrated Covid-19 Threat Scale were calculated by measuring the mean rating for each participant: overall for all 10 items and separately for the five symbolic and the five realistic items. We assessed internal reliability using Cronbach’s Alpha, for the full item set and separately for its two parts (symbolic and realistic). We compared the Cronbach’s Alpha values of the English and Hebrew scales using the COCRON online tool (13). Mean scores of the English and Hebrew scales were compared using a two-tailed independent samples t-test based on the mean and SD values reported in Kachanoff et al. (1). Theoretical statistics and factor analysis were

calculated and compared with the measurements reported for the original version of the scale in Kachanoff et al. (1).

RESULTS

Reliability. Cronbach’s Alpha was high for both English and Hebrew scales, but it was significantly higher for the full English version relative to the full Hebrew version of the scale (4.55, $p=0.032$) and also higher for the English relative to the Hebrew version of the symbolic threat items (11.81, $p=0.006$). There was no significant difference in the Cronbach’s Alpha among the English and Hebrew realistic threat items (0.15, $p=0.70$). These results are depicted in Table 2.

Scores. The mean scores were significantly higher in the English relative to the Hebrew scale (full Scale: $t(836)=6.9$, $p<0.0001$, %95 CI [-0.36 -0.20]; Symbolic threat items: $t(836)=5.02$, $p<0.0001$, %95 CI [-0.36 -0.16]; Realistic threat items: $t(836)=7.13$, $p<0.0001$; %95 CI [-0.39 -0.22]).

Internal reliability was demonstrated by a significant correlation between the different parts of the scale ($r=0.42$, $p<0.001$) and between each part of the scale with the full scale (Symbolic threat: $r=0.086$, $p<0.001$; Realistic threat: $r=0.83$, $p<0.001$). External reliability was demonstrated by a significant correlation between the full scale and the Anxiety GAD-7 scale ($r=0.29$, $p<0.01$) and separately with each of its parts (Symbolic threat: $r=0.21$, $p<0.001$; Realistic threat: $r=0.29$, $p<0.001$). These results are depicted in Table 2.

Risk factor. We compared the scores of participants who considered themselves at risk for the coronavirus ($N=117$) and those who considered themselves not a risk ($N=341$). Participants who responded that they did not know whether they are at risk or not ($N=34$) were not included in this analysis. For both scales (symbolic and realistic) there was a trend of higher threat perception scores for the risk group relative to the non-risk group (Table 3). However, for symbolic threats this effect was only marginally significant

Table 2. Reliability, means and correlations ($N=492$). The first three rows are based on the data of the Hebrew version of the COVID-19 threat scale. In parenthesis: the equivalent values of the English version based on Kachanoff et al., 2020 ($N=346$). The last row represents data of the Anxiety scale (Spitzer et al., 2006). Significance values: * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

	COVID-19 Threat - Full Scale	COVID-19 Threat - Symbolic	COVID-19 Threat - Realistic	Mean	SD	Reliability
COVID-19 Threat - Full Scale				2.46 (2.74)	0.57 (0.59)	$\alpha=0.81$ (0.85)
COVID-19 Threat - Symbolic	0.86*** (0.89)			2.02 (2.28)	0.70 (0.79)	$\alpha=0.78$ (0.85)
COVID-19 Threat - Realistic	0.83*** (0.80)	0.42*** (0.45)		2.90 (3.21)	0.64 (0.59)	$\alpha=0.76$ (0.77)
Anxiety - GAD-7	0.29**	0.21***	0.29***	5.48	4.98	$\alpha=0.91$
Age	-0.052	-0.02	-0.07	41.15	14.64	
Num. of people living in the house	-0.02	-0.01	-0.01	3.80	1.68	

Table 3. Mean scores of the COVID-19 Threat scale according to Risk Group (Yes/No) as reported by the participants, and according to Gender (Female/Male)

	N	COVID-19 Threat - Full Scale	COVID-19 Threat - Symbolic	COVID-19 Threat - Realistic
High risk	341	2.54 (0.63)	2.13 (0.77)	2.96 (0.71)
Low risk	117	2.43 (0.54)	1.98 (0.67)	2.88 (0.62)
Female	258	2.50 (0.54)	2.05 (0.69)	2.96 (0.62)
Male	234	2.42 (0.59)	2.00 (0.72)	2.84 (0.67)

($t(456)=1.98, p=0.048$), and for realistic threats it was not significant ($t(456)=1.221, p=0.223$) (Table 3).

Factor structure of integrated COVID-19 Threat Scale. Following Kachanoff et al. (1) we performed a principal component analysis on the measured scores. Consistent with the findings of Kachanoff et al. (1), this analysis revealed a two-factor solution: one factor with the five items assessing symbolic threat (Eigen Value=3.71, Variance Explained=37.13%) and one with the five items assessing realistic threat (Eigen Value=1.58, Variance Explained=15.77%). Factor loadings are presented in Table 4.

DISCUSSION

The Hebrew version of the Integrated Covid-19 Threat Scale was found to be internally reliable with high Cronbach's Alpha values, and also externally reliable when correlated with an anxiety scale. However, internal reliability was higher for the English relative to the Hebrew version of the scale.

We also found a marginally-significant difference between high and low risk participants in their perception of symbolic threats. However, contrary to our prediction, we found no difference between the groups in the perception of realist threats. This is surprising because it may reflect a mismatch between the perception of threat and objective threat. This mismatch could either result in an inflated perception of threat by people who are not at risk, i.e., people for whom COVID-19 is not a life threat, perceive its threat as higher than it actually is, or it could result in a deflated perception of threat by people who are at risk, for whom the outbreak is a life-threatening situation although they do not perceive it as such. However, an

alternative interpretation of this finding makes it much less surprising. Consider that this scale averages together threats of very different types, including health threats and financial threats. It is likely that for people who are young and healthy, but potentially responsible for providing for families, the financial threat of COVID-19 is so immense that it balances out the health threat of the older population who are at risk. This interpretation reveals a limitation of this scale that it is not designed to differentiate - between specific types of scales. Future studies will be required to examine the effect of the type of threat in depth.

Another unexpected finding was that the mean scores of the two versions were higher for the English than the Hebrew version, indicating higher threat perception among the U.S. participants relative to the Israeli participants. The most likely explanation for these differences is the different administration time of the two scales: the English scale was administered from March 19-20, 2020, whereas the Hebrew scale was administered almost a month later, from April 11-19, 2020. March 19, 2020, signaled the beginning of the crisis - as that was the day when California, the first state to issue a stay-at-home order, announced this order. It is possible that threat levels were higher at the beginning, when the unknown situation was overwhelming. By April, distress caused by uncertainty and threat perception may have been slightly reduced. Despite a larger relative number of cases in Israel during our study relative to the U.S. during the original study, the slope of the COVID-19 curve was much steeper during the original study. In fact, while the number of cases during the 8-day conductance of our study increased by 127.4% (from 1,202.47 cases per million on the first day of the study, April 11, to 1,532.54 per million on the last day of the study, April 19), during the 9-day carrying out of the original study it increased by 1112% in the U.S. (from 28.44 cases per million on the first day of the first study, March 19, to 259.79 cases per million on the first day of the last study, March 27) (these numbers are according to <https://ourworldindata.org/coronavirus-data>). This high acceleration of the outbreak in the U.S. at the time of the first study could have caused a feeling of helplessness, which is associated with high perception of threat in other traumatic contexts (14, 15).

Other explanations for this difference in scores could be attributed to cultural, historical and economical differences between the two countries. It could, for instance, be hypothesized that the overall level of anxiety and threat perception is higher in Israelis than in Americans, arguably, due to differences in personal security between these two countries. If this is the case, it could be claimed that

Table 4. Varimax rotated factor loadings of a Principle Factor Analysis of the 10-item integrated COVID-19 Threat Scale

Item	Symbolic Threat	Realistic Threat
1	0.621	0.336
2	0.712	-0.08
3	0.655	0.097
4	0.779	0.165
5	0.758	0.256
6	0.116	0.665
7	0.070	0.774
8	0.141	0.667
9	0.154	0.74
10	0.213	0.655

the COVID-19 situation would have had a lesser effect on Israelis than on Americans. Political studies support this hypothesis by suggesting that Israel, as a country, has a unique conceptualization of threat which is believed to stem from its extended conflict with the Palestinians, the relatively frequent wars during its short history of this country and perhaps also from the long history of the Jewish people as a prosecuted minority in Europe (16). However, to our knowledge, there is currently no psychological evidence to support the claim that threat perception and anxiety are in general elevated in Israeli individuals relative to Americans. There are a few studies that examined this aspect in Israeli population, but they all did so in respect to acute stressful situations such as during war-times or times of frequent terrorist attacks (17-19). Consequently, this issue remains speculative and requires further research.

The economical differences between the countries could also have contributed to the reduced levels of threat perception in Israel. Although the two countries advance free-market economies, Israel has stronger socialist aspects to its economy, including a public health care system (20). This could have provided Israelis with a stronger sense of confidence regarding their health and financial security during the crisis. A study conducted in Israel at the beginning of the outbreak showed that when participants believed that they would be compensated for loss of income during the crisis, the public attitudes toward the crisis management were improved and compliance with regulations was enhanced (21).

Another potential source of the difference in mean threat perception between Americans and Israelis are the differences between these countries in regulations and the management of the COVID-19 crisis at the time of the studies. For instance, Israel employs mass surveillance technologies to fight the spread of the virus and provided people with real-time information on possible encounters with confirmed COVID-19 patients (8) Despite an active debate regarding privacy issues, this policy may have increased the individual level of security. In the U.S., on the other hand, such methods are not employed. Last, it is also possible that these differences were due to the translation or cultural adaptation of the scale items, but we find this unlikely due to the straightforwardness of the adaptations that were applied.

We conclude that the Hebrew version of the COVID-19 Threat Scale can be used as a reliable index of the perceived threat of the coronavirus among Israelis. It would be an important contribution for future studies to use the different version of this scale to follow the

progression of threat perception among different populations during this crisis.

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