

Exposure to traumatic events and perceptual priming in forcibly displaced Colombian population in Ecuador

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Título: Exposición a eventos traumáticos y priming perceptivo en población colombiana con desplazamiento forzado en Ecuador.

Resumen: Los recientes estudios en priming perceptivo se han centrado en identificar las diferencias entre población con y sin Trastorno por Estrés Postraumático (TEPT) confirmando la hipótesis que el TEPT representa un trastorno de la memoria. En este trabajo, se pretende abordar el priming en personas que han estado expuestas a diversas experiencias traumáticas relacionadas con el desplazamiento forzado. Para ello, se diseñaron tres categorías de palabras "trauma" (i.e., de amenaza, emocional y judicial) y una categoría de palabras "neutra", las cuales compartían su raíz de tres letras. Participaron 44 colombianos refugiados y solicitantes de asilo que residen en Ecuador con presencia o ausencia de TEPT. Los resultados confirman que las personas con TEPT presentan mayor priming perceptivo en las categorías de amenaza y emociones y los solicitantes de asilo en la categoría judicial. Se discuten las implicaciones para los estudios que abordan el impacto de violencia política.

Palabras clave: priming perceptivo; compleción de raíces de palabras; trastorno por estrés postraumático; desplazamiento forzado.

Abstract: In line with the hypothesis that PTSD is a memory disorder, recent studies on perceptual priming have focused on identifying the differences between population with and without Post-Traumatic Stress Disorder (PTSD). This study addresses priming in people who have been exposed to traumatic experiences of forced displacement. To that end, three categories of the word "trauma" (i.e., of threat, emotional and judicial) and a category of "neutral" words, which shared their three-letter root were chosen. The participants were 44 Colombian refugees and asylum seekers living in Ecuador with or without PTSD. The results of our study point that people with PTSD have higher perceptual priming in the threat and emotional categories, and asylum seekers show higher priming in the judicial category. The implications for studies that address the impact of political violence are discussed.

Keywords: perceptual priming; word-stem completion task; post-traumatic stress disorder; forced displacement.

Introduction

Since the mid-1990s, more and more attention has been paid at the role of cognitive processes in the diagnosis of Post-Traumatic Stress Disorder (PTSD) following the fourth version of the DSM (American Psychiatric Association (APA), 1994). The attention has been focused on memory issues following changes in Criterion A, in a special way on an unexplored memory mechanism: the relationship between PTSD symptomatology and implicit memory. Perceptual priming in populations with PTSD (Amir, McNally, & Wiegartz, 1996; Ehling & Ehlers, 2011; Michael, Ehlers, & Halligan, 2005) was the main research issue. According to Tulving, Schacter and Stark (1982) "priming refers to facilitative effects of an encounter with a stimulus on subsequent processing of the same stimulus (direct priming) or a related stimulus (indirect priming)" (p. 336). Specifically in PTSD, there is particularly strong perceptual priming "for stimuli that were temporally associated with the traumatic event, i.e. there is a reduced perceptual threshold for these stimuli" (Ehlers & Clark, 2000, p. 326).

Word-stem completion task was the initial research tool. Later on, Michael et al. (2005) and Ehling and Ehlers (2011), when exploring the differences between groups with and

without PTSD, used three methodological approaches: a) the traumatic and neutral words shared a three-letter root; b) the words are grouped into three categories: words related to the traumatic event experienced, words of general threat, and neutral words; and c) the free-recall task that evaluates an explicit memory is analyzed when there are no significant differences in the recollection of experimental words between the groups. There were two main findings: first, perceptual priming happens in comparing groups with and without PTSD; second, in PTSD participant's perceptual priming occurs in event related words.-

These studies have been conducted mainly in populations with and without PTSD exposed to events such as motor vehicle accidents or who were victims of sexual violence. However, no perceptual priming explorations have been carried out with populations exposed to political violence.

Studies on PTSD in forcibly displaced population

Refugees and asylum-seekers refugees are highly exposed to the PTSD, with a prevalence of over 30% (Georgiadou, Morawa, & Erim, 2017; Kira, Shuwiekh, Rice, Al Ibraheem, & Aljakoub, 2017; for full review see Fazel, Wheeler, & Danesh, 2005). However, as it is well known, self-report questionnaires overestimate the prevalence of PTSD (Fazel et al., 2005; Hollifield et al., 2002; Turner, Bowie, Dunn, Shapo, & Yule, 2003). In addition, there is a tendency to associate refugee status and PTSD, overlooking the fact that this population presents cultural differences that the diagno-

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sis of PTSD does not grasp (Steel, Silove, Phan & Bauman, 2002).

Recently, Colombia reached a Final Agreement for the End of Conflict and the Construction of a Stable and Lasting Peace (2016) signed between the Colombian Government and the Revolutionary Armed Forces of Colombia-People's Army (FARC), which attempts to put an end to an armed conflict that has lasted for more than six decades. More than 7 million forcibly displaced persons and more than 200,000 dead people (UNHCR, 2017; Centro Nacional de Memoria Histórica, 2013) have been victims of the armed conflict. Studies on the psychosocial effects on the population displaced by the internal conflict are mostly focused on PTSD, which ranges from 7% to 88% in this population. This high variability may be due to the size of the samples (ranging from 100 to 6,353 individuals) and the instruments used for their evaluation, which make integration and more accurate reading of the data difficult (Campos-Arias, Oviedo, & Herazo, 2014). All the studies found that experiences of kidnapping and torture have the greatest impact on the development of PTSD.

Despite these results, epidemiological data regarding population forced to displace outside Colombia is not available. UNHCR (2017) estimates more than 60,000 refugees in Ecuador and more than 200,000 political asylum seekers. Research in similar contexts show differences in vulnerability of displaced groups according to their migration status; that is, whether they are refugees or applicants, finding out that the latter show additional stressful uncertainties such as the need to regulate their legal status in the host country (Steel et al., 2002). Aspects such as the search for housing and employment (Ibáñez & Moya, 2006), health problems (Mogollón-Pérez & Vázquez-Navarrete, 2006) or exposure to exclusion and discrimination or even the presence of menacing groups in the host society have also been considered. Steel et al. (2002) state that, compared to refugees, asylum seekers are more likely to develop PTSD, given the recent emotional impact experienced in their countries of origin and the distressful uncertainty in the asylum application process. Moreover, applicants on an intensive basis demand for justice for the events they experienced, either because they filed a legal remedy in their country of origin or because they ask institutions for support in this area (Herlihy & Turner, 2015).

For all the above reasons, the aim of this study is three-fold: a) identifying the presence of PTSD in Colombian population with forced displacement residing in Ecuador; b) analyzing the differences based on migration status, and c) exploring the mechanisms of perceptual priming. Following Michael et al.'s (2005) procedure, we use the word-stem completion task according to the following categories: words that refer to a general threat, words of an emotional nature, legal terms and neutral words. The main hypotheses were as follow:

Hypothesis 1: *Participants with PTSD will show higher perceptual priming than participants without PTSD in the general threat, emotional, and judicial categories.*

Hypothesis 2: *Asylum seekers will show higher perceptual priming than refugees in the emotional and judicial categories. No differences are expected in the general threat category.*

Hypothesis 3: *No differences are to be found in the free recollection test by PTSD level or by immigration status.*

Method

Participants

Forty-four people with Colombian nationality who attend the institution "Asylum Access Ecuador" (AAE) in Quito participated voluntarily.¹ The participants were 37 women (84.1%) and 7 men (15.9%) between the ages of 18 and 53 ($M = 33.3$ years; $SD = 9.5$). Most of them come from the Colombian Departments of Nariño, Valle del Cauca, Huila, Caquetá and Antioquia. The main reason for leaving Colombia was the climate of extreme violence and threat from armed groups, which led them to forced displacement and subsequent asylum seeking in Ecuador, where they are under care of AAE. In terms of their migration status, 40.9% have refugee status recognized by the Ecuadorian State and 59.1% are asylum seekers. Table 1 provides descriptive statistics for each of the socio-demographic characteristics.

Table 1. Descriptive statistics of the refugee and asylum seeker sample.

Studied variables	Refugees and Asylum Seekers	
	With PTSD ($n = 22$)	Without PTSD ($n = 22$)
Sex		
Male	2	5
Female	20	17
Age (<i>average</i>)	35.3	31.3
Migration Condition		
Refugee	40.9	40.9
Asylum Seeker	59.1	59.1
Time spent in Ecuador (<i>months</i>)	48	28
Civil Status (%)		
Single	54.5	54.5
Married	9.1	4.5
Consensual Union	22.7	36.4
Separated	9.1	4.5
Widow	4.5	0
Children (%)		
With Children	95	72.7
Without Children	5	27.3
Education Level (%)		
Without studies	9.1	0
Elementary	27.3	45.5
Secondary	59.1	40.9
Technician-University	4.5	13.6
Work Activity (%)		
Works in Ecuador	18.2	54.5

¹ Asylum Access Ecuador (AAE) is a non-governmental organization that provides support services to refugees in Ecuador since 2007. It carries out various actions aimed at political and social spheres, as well as specific attention to displaced population in general, being the Colombian population the main beneficiary.

Studied variables	Refugees and Asylum Seekers	
	With PTSD (<i>n</i> = 22)	Without PTSD (<i>n</i> = 22)
Does Not Work in Ecuador	81.8	45.5
Income Level (%)		
Less than US\$ 318	90.9	63.6
More than US\$ 318	9.1	36.4
Type of Traumatic Event (%)		
Forced Displacement (<i>plus</i> <i>additions</i>)	72.7	65
Abuse	22.7	25
Others	4.6	10
GPTSS Score	66.6	38.8

Note. PTSD = Post-Traumatic Stress Disorder; GPTSS = Global Post-Traumatic Stress Scale

Procedure

An initial meeting was held with the AAE technical team (Quito headquarters) to explain the objectives of the study. This team reviewed the material and then authorized a pilot application to 10 users, aimed at assessing the relevance and understanding of the tasks. Afterwards, the results of this application were presented to the AAE team, which allowed to initiate the implementation for all users interested in participating voluntarily.

Through posters placed in AAE, both users and visitors were invited to an individual interview. In the interview, the objectives of the study were disclosed, the participants were informed of the confidentiality of the test and read—or it was read to them—an informed consent form that they then signed. In a second phase, the experiment of perceptive priming was applied, followed by an interview guided by a questionnaire. Subsequently, after a 10-minute break, an interview of approximately 30 minutes was conducted where participants detailed different reasons for join the AAE (e.g., concern about health problems, nightmares, persecution feelings, family problems, among others). Finally, one week later, a second interview was carried out to return the results. Bearing these considerations in mind, the selection of the sample is non-probability. Participation was voluntary and participants were identified by numerical codes that preserved anonymity in data processing.

Instruments

Socio-demographic data. Aspects such as sex, age, country of origin, civil status and educational level are taken into account.

Migration status. Information was gathered from each of the participants regarding their application for refuge in Ecuador. The possible answers were four: granted refuge, application for asylum, denial of refuge, and undocumented. For the purposes of this study, any condition in which the participant does not have granted refuge in Ecuador was categorized as an asylum seeker. The responses were therefore grouped into 1 = *refugee*, 2 = *asylum seeker*.

Time of residence in Ecuador. They were asked about their year of arrival to Ecuador. Responses were grouped into three categories: 1 = less than 3 years, 2 = between 3 and 6 years and 3 = more than 7 years.

Work status in Ecuador. There were two possible answers: 0 = *does not work* and 1 = *works*.

Global Post-traumatic Stress Assessment Scale (GPTSA; Crespo & Gómez, 2012). Scale validated in Spanish population that assesses traumatic events, PTSD symptomatology and global functioning showing a list of traumatic events (e.g., natural disasters, physical violence, terrorist acts or torture, combat or exposure to war zones, imprisonment, detention or forced captivity, among others). In addition, the scale evaluates the presence and degree of incidence of symptoms in four dimensions: re-experimentation, avoidance, hyperactivation and subjective clinical symptoms. It is made up of 62 items in a Likert format, ranging from 0 (*none*) to 4 (*extreme*). The reliability obtained for this scale is very satisfactory ($\alpha = .90$).

Word Stem Completion Task

Word Selection. A total of 96 words were selected, which share a range of frequency of use in Spanish (Alameda and Cuetos, 1995). Three groups of them (12 in total) were related to traumatic experiences: words of general threat (e.g., danger, insecurity, persecution), emotional words (e.g., impotence, helplessness, resentment), and judicial words (e.g., protest, accusation, conviction). Neutral words had the same three-letter root per category (i.e., 12 for each category). Following the procedure of previous studies in perceptual priming (Ehring & Ehlers, 2011; Michael et al., 2005), for each of these categories a neutral word was presented that shared the same range of frequency of use and the same first three letters that formed the root. This characteristic allows for competition between the “trauma” word and the “neutral” word. Finally, 12 other words were included as a way of controlling the effects of primacy and recency (Bowers & Schacter, 1990; Michael et al., 2005).

The list of traumatic words was generated from an initial selection of 320 words, which were validated by judges with expertise in trauma. As indicated above, the words were grouped along the following categories: (a) “general threat,” which is part of perceptual priming studies (Michael et al., 2005); (b) the “emotional” category was included because many words with traumatic significance are directly identified with emotions; (c) the “judicial” category was proposed by the AAE team that reported on the recurrent request for justice made by a large number of users in the early stages of the asylum application. The inter-judge validation procedure according to Kendall’s *W* had a significant level of agreement ($W = .381, p = .034$). Thus, 36 “trauma” words were obtained, to which 60 “neutral” words were added, sharing the same three-letter root and range of frequency of use. This makes up the total number of words used in the tests.

Coding task. Participants were shown the 96 words and were instructed to read them aloud as soon as they appeared on the screen. They were not asked to memorize them, but were informed that they were doing a concentration task. The words were presented randomly in a successive order of 3,000 milliseconds (ms) on a 14-inch HP laptop. These appeared on the screen in a central position, with a white background, font Courier New, size 18, black. Later on, there was an interval of 10 minutes for participants to perform an activity unrelated to the test.

Priming task. 48 three-letter roots were presented, corresponding to the four categories of words in the coding task. Also, the roots of the words were presented randomly and appeared in the same position, size and color as the words in the coding task. In this procedure, the answers of the participants were recorded by the interviewer on a sheet of paper.

Free Recall Test

Participants were asked to write down on the sheet of paper the words they remembered from the coding task.

Results

Categorization and Data Computation

Scoring for the “trauma” root words. For the calculation of “priming,” the completed “trauma” words matching those presented during the priming task (e.g., *marginalized* by *marginalization*) were considered; words that were considered correct.

Computation of completed words. On the other hand, the “priming” computation did not take into account the completed “neutral” words that matches the experimental neutral words, since the objective was to identify the “trauma” words. However, unlike other studies already mentioned (Ehring & Ehlers, 2011; Michael et al., 2005), analyses of all completed words and frequencies of all responses given by participants to the introduction of roots were conducted.

Priming measurement. It is the proportion of completed “trauma” words matching the words presented in the coding task.

Presence or absence of post-traumatic stress. The sample is divided into two groups based on the presence or absence of PTSD. Crespo and Gómez (2012) establish as a criterion of correction in the GPTSA test the sum of scores in intensity of symptoms in three areas: re-experimentation, avoidance and hyperactivation.² Thus, the presence or absence of PTSD was considered by adopting the grouping criterion of the 50th percentile as cut-off point.

Group differences by PTSD level in socio-demographic condition and scales

2 For the calculation of PTSD level, the area of subjective clinical symptoms was not considered, given that previous studies on priming only include re-experimentation, avoidance and hyperactivation.

Considering that the sample of participants was reduced to the level of exposure to post-traumatic stress, several analyses were conducted on the socio-demographic variables. No differences were found in terms of sex, migration status, length of stay in Ecuador, civil status and education level (all $p > .05$). It was found that the PTSD group had more children than the non PTSD group, $\chi^2 (N = 44) = 4.247, p = .03$. Also, the PTSD group showed lower work activity, $\chi^2 (N = 44) = 6.286, p = .01$ and lower income than the non PTSD group, $\chi^2 (N = 44) = 5.059, p = .08$. The displacement situation was identified in most participants as the central and most traumatic event. In other cases, displacement was accompanied by other experiences (e.g., exposure to violent death of relatives, friends or meaningful others, forced detention, among others). However, when comparing one group with displacement only and another with displacement plus other traumatic events, no differences were found in the level of PTSD.

Scoring of Word Stem Completions by word category

Regarding the responses given by participants to the presentation of the root, four types of words were identified: (a) “trauma” words matching the experimental list, (b) “neutral” words matching the experimental list, (c) words not matching the experimental list, and (d) there is no response to the root. Words that did not match the experimental list were grouped into two categories: invented “neutral” words (e.g., the word *mold* to the root “*mol*”), and invented “emotionally charged” words (e.g., the word *martyrdom* to the root “*mar*”). Descriptive data on the number of words completed by participants in each of these categories are presented below (Table 2). Participants with PTSD show more responses in the threat categories in priming words, while participants without PTSD give more invented responses in the category of judicial words.

Perceptual priming based on presence or absence of PTSD

Results are presented in Table 3. A variance analysis of 3 (categories of words) X 2 (group type) was conducted. A significant effect was found in the interaction categories of words X group type ($F(4, 44) = 3.042, p = .01, \eta^2 p = .01$). Comparisons confirmed that the PTSD group showed higher priming for words related to general threat, $t(44) = -2.663, p = .011, d = -.80$, and in emotional words, $t(44) = -2.439, p = .019, d = -.74$ than the group without PTSD. There were no differences between the groups in terms of judicial words ($t(44) = -.446, p = .658, d = -.20$), or neutral words ($t(44) = 1.043, p = .303, d = .30$). Thus, hypothesis 1 is partially met since, as expected, the PTSD group presented higher priming in the threat and emotional categories, but not in the judicial ones.

Table 2. Number of words per category according to presence or absence of PTSD.

Category	PTSD						χ^2
	With PTSD (n = 22)			Without PTSD (n = 22)			
	Priming	Invented	WO	Priming	Invented	WO	
Trial	61	116	43	58	134	28	8.43*
Neutral	64	174	26	68	170	26	2.97
Threat	113	122	29	69	142	53	33.12***
Emotions	77	141	46	67	155	42	5.62
Judicial	63	162	39	62	187	15	12.44*
Total	378	715	183	324	788	164	27.11**

Note. PTSD = Post-Traumatic Stress Disorder; WO = without response

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

Table 3. Perceptual priming scores in categories according to PTSD presence or absence.

Priming Category	PTSD			
	With PTSD (n = 22)		Without PTSD (n = 22)	
	M	SD	M	SD
Neutral	.52	.08	.54	.08
Threat	.17*	.11	.09	.07
Emotions	.10*	.08	.05	.05
Judicial	.07	.05	.06	.05

Note. PTSD = post-traumatic stress disorder.

* $p < .05$

Free recall task based on PTSD presence or absence

Results from the free recollection task are shown in Table 4. As expected, there were no significant effects.

Table 4. Scores in free recollection task based on PTSD presence or absence.

Free Recollection	PTSD			
	With PTSD (n = 22)		Without PTSD (n = 22)	
	M	SD	M	SD
	.09	.03	.10	.05

Note. PTSD = post-traumatic stress disorder.

Perceptual priming based on migration status

There was no interaction between the category of the word and migration status. When comparing by migration status, no differences were found in the word categories of general threat or in words with emotional content (all $p > .05$). On the other hand, as expected, significant differences were found in the category of judicial words ($t(44) = -2.056, p = .04, d = -.78$), where asylum-seeking participants exhibited higher priming. Therefore, hypothesis 2 is partially met, since while the expected difference in the judicial category is noticed, there are no differences in the emotional category. Lastly, significant differences were found regarding neutral words ($t(44) = 2.707, p = .010, d = .83$), where refugees showed higher priming. The results are presented in Table 5.

Table 5. Priming scores in categories based on migration status.

Priming Category	Migration Status			
	Refugee (n = 18)		Asylum Seeker (n = 26)	
	M	SD	M	SD
Neutral	.27*	.06	.22	.06
Threat	.13	.13	.13	.08
Emotional	.07	.06	.08	.08
Judicial	.04	.04	.08*	.06

Note. * $p < .05$

Free recall task based on migration status

Table 6 shows the results in the free recollection task based on migration status. As expected, there were no significant effects ($t(42) = -1.732, p = .091, d = .09$).

Table 6. Scores in free recollection test based on migration status.

Free Recall	Migration Status			
	Refugee (n = 18)		Asylum Seeker (n = 26)	
	M	SD	M	SD
	.09	.01	.10	.01

Discussion

This study explores perceptual priming in Colombian refugees and asylum seekers residing in Ecuador, becoming the first known study to explore the effects of traumatic experiences on this population in implicit memory. Results suggest a partial confirmation of hypothesis 1. As a matter of fact, a higher perceptual priming is found in the general threat and emotional categories in the PTSD group, but not in the judicial category. This allows for several interpretations: first, as suggested by the DSM-5 diagnostic criteria (American Psychiatric Association (APA), 2013), disorder has effects on the threat and emotional dimensions. Threat perception and high emotional instability condition the onset of PTSD. Second, the general threat category is identical to that used in previous studies (Ehring & Ehlers, 2011; Michael et al., 2005), but contrary to their results here a correlation with the degree of priming appears. Third, the emotional category generated could be included in perceptual priming studies with samples

that have experienced other traumatic events, regardless of whether they are related to forced displacement or political violence.

With regard to hypothesis 2, the results by migration category confirm the discrepancies only in the judicial category. This makes it possible to strengthen Herlihy and Turner's (2015) ideas on the demand for justice by asylum-seekers. However, no differences were found in the emotional category, as suggested especially for asylum-seekers (Steel et al., 2002). The free recollection test is met in Hypothesis 3 regarding the level of PTSD and migration status, accordingly. This allows verifying once more that the differences are produced in the priming and not in direct measurements of memory, essential in this type of procedure.

On the other hand, considering exposure to other traumatic events makes it possible to identify events related to the displacement experience. This leads to a cumulative effect of trauma characterized by an excessive amount of stress and repeated exposure to the event (Kira, 2010; Kira, Templin, Lewandowski, Ashby, Oladele, & Odenat, 2012), which means that a central traumatic experience triggers other impacts. In this case, the displacement experience becomes a central experience to which other traumatic events such as forced detention or the violent death of significant ones are often added. As a consequence, this cumulative effect (the dose hypothesis) impairs the neuropsychological performance of learning, attention and memory (Admon et al., 2009).

In the context of high and permanent vulnerability to which displaced persons are exposed, the impact on the memory of the trauma is an essential aspect of all types of mental health intervention and asylum-seeking procedures. In this case, on the one hand, it has been pointed out that there are implicit elements in the memory of this population that are affecting the processing of traumatic events, especially the perception and association with sensory details of the traumatic experience. This requires incorporation into psychosocial care plans contrasting current needs with the effects of these experiences (Beristain, 2009; Lira, 2010). On the other hand, the institutions that counsel displaced persons and the State Agency that decides their migration status in the host society must consider the cumulative effects of trauma and its impact on memory (Graham, Herlihy, & Brewin 2014). This means that these procedures cannot be aimed solely at detecting and demonstrating the threats and

harms suffered, but must incorporate the barriers and avoidance behaviors that displaced persons exhibit, especially in situations of sexual abuse or torture.

Limitations

Despite of word-stem completion as a useful research tool, this task does not allow reaction times to be measured. It only records responses. Thus, the evaluation of implicit processing is to be related only to the word completed by the participant and not to the latency times, an aspect that is essential to confirm the automaticity of the processing. The use of voice recording during the response emission would be required to evaluate the differences regarding this point. Another possibility is to use a version of the lexical decision test via the identification of experimental words.

A second limitation is that the criterion for measuring PTSD level is based on self-report questionnaires, which—as is well known—are often affected by responses aimed at social desirability. It would be important to complement the diagnostic results of the GPTSS through diagnostic interviews. Another aspect to evaluate in refugee and asylum-seeker populations is the aforementioned cumulative effect of trauma (Gamache, DeMarni, DePrince, & Freyd, 2013; Kira et al., 2008) that would facilitate a comprehensive understanding of the impact of traumatic events. As noted, PTSD evaluation is insufficient to assess this type of group.

In future research, internally displaced persons remaining in Colombia should be included as a reference group to note the differences in the cumulative effect of trauma on displaced persons inside or outside the country. Likewise, it should be add measures that address both individual and collective coping strategies, and particularly religious coping (Kroo & Nagy, 2011; Pargament & Brant, 1998). Lastly, as stated above, displacement is associated with other events highly stressful. Therefore, it would be needed to include personal displacement experiences using qualitative methods that would allow the multiple sides of this situation to be addressed in greater detail.

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