

# The Development-Based Taxonomy of Stressors and Traumas: An Initial Empirical Validation

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## Abstract

The development-based trauma framework (DBTF) proposed a comprehensive taxonomy of stressors and traumas based on the salience of existence and identity development. The goal of this research is to check the validity of some of the DBTF parameters, specifically the trauma types severity (Types I, II, and III), and the six major trauma types (attachment, personal identity, collective identity, role identity, survival and secondary traumas) differential impact and proliferation. We used a sample from 11 Arab countries (N = 2732), age ranged from 18 - 91, mean = 26.9, and SD = 10.01, with 69.3% females. We used measures for cumulative stressors and traumas, PTSD, depression, anxiety, and executive functions. We conducted correlation and path analysis. Correlation explored the differential sizes of association between types I, II, III traumas and mental health and executive function deficits. Path analysis explored the proliferation of and paths between the six major types of trauma and their impact on mental health and cognitive functions. Results indicated that the size of associations of type III trauma and mental health and executive function variable were significantly larger than type II trauma and the same for the difference in the associations between type II and type I, which validate the differential intensity impact of trauma types. Results indicated that attachment traumas have the highest impact on other traumas, followed by early childhood adversities (personal identity trauma) and collective identity traumas, with differential impact on mental health and executive functions. The conceptual, trauma measurement and clinical implications of results were discussed.

## Keywords

Type III Traumas, Stressors, Executive Functions, Taxonomy of Trauma,

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## 1. Introduction

The development-based trauma framework (DBTF) that is behind a taxonomy of traumas proposed in the literature (Kira, 2001, 2021; Kira et al., 2008a, 2013a, 2013b, 2014a) redefine traumas as events, sequence of events, or conditions that pose an existential threat to one's physical, personal and social identities. This definition extends the current focus on the physical integrity of the person and the mortality saliency model to an identity saliency-based definition. It expands the valence of threat to the existential threats to the person's different identities, not only the physical identity death threats. Persons maintain personal autonomy and executive self (Personal identity) and sometimes commit suicide (executing their physical self) if this personal identity is severely violated, which may cause intolerable psychological pain (Joiner, 2005; Shneidman, 1993). They also identify and internalize their group of belonging to the extent that they are ready to die and sacrifice their physical identity for it (e.g., Ashmore et al., 2004; Kira, 2019; Kira et al., 2020b, 2011, 2017; Stryker & Serpe, 1994). This definition is more in touch with the phenomena of traumatization in real life and real-time. Identity trauma paradigms, personal and collective, are emerging frameworks (e.g., Alexander et al., 2004; Hirschberger, 2018; Kira, 2001, 2006, 2021; Kira et al., 2019a, 2020b; Plotkin-Amrami & Brunner, 2015). These emerging paradigms are structured and organized within DBTF. Additionally, the DBTF considers traumatic events as part of the global stress dynamics. In real life and real-time, we cannot separate traumatic (acute stressors) from chronic and other non-acute stressors that interact and have a cumulative and global impact on physical, mental, and cognitive functioning.

This definition of traumatic stress is based on the saliency of emerging existence (i.e., the saliency of the existence of the person's developing identity and her/his executive self) as contrasted to the saliency of the physical mortality in the current trauma paradigm. The current trauma paradigm in DSM-IV and DSM-V (APA, 2013) defines trauma, in most part in terms of exposure to actual or threatened death, ignoring the existential threat to identity, personal or social. Mortality and existence are the endpoints of the same continuum. Both mortality and existence are salient human conditions. However, shifting parameters from mortality to existence gave us a more robust conceptual tool to understand the dynamics of traumatization, especially in minorities and children victims of attachment disruptions. Existential threats include physical mortality threats, while physical mortality threats do not include all the individual's existential threats. For example, under the current trauma paradigm, the mother's abandonment of the infant may not constitute a trauma because it did not constitute a threat to the physical integrity of the infant. However, the infant's survival as a developing

person depends, in significant part, on the mother's and caregivers' care. Another entity, for example, an institution, may take care of him/her, and the infant will not physically die from the abandonment. However, his/her emotional and cognitive development may be severely impaired through life span as in foster care experience. Attachment disruptions were found to impact IQ and cognitive functioning (e.g., Kira et al., 2012b). Attachment is a direct existential threat to the infant in the proposed existential paradigm of traumatic stress. The infant's existential survival is entirely dependent on the mother (or the caregiver). According to the DBTF paradigm, attachment is a severe traumatic event that will affect the developing person negatively for the rest of her/his life, as the compelling empirical evidence indicated and will be discussed further in a subsequent section. The same argument applies to discrimination as traumatic stress. Discrimination is not considered trauma in the current trauma paradigm. In the existential (DBTF) paradigm, different discriminations (and intersected discrimination) are existential threats to the person's collective or personal identity. Discrimination and intersected discrimination has severe adverse physical, mental, and cognitive outcomes for the victim, as we will elaborate in a subsequent section. This trauma definition calls for more effective practices for assessing, conceptualizing, and treating traumatized clients.

DBTF-based taxonomy of stressors and trauma include pre-identity (complicated birth, attachment disruptions, early childhood adversities), identity traumas (physical, personal, and social), interdependence (primary vs. secondary, and tertiary), and aging stressors and traumas. Grouping the stressors according to the developmental stage they impact is essential for different reasons. A single trauma may not seriously impact the resilient person; poly-victimization (poly-traumatization) or clusters of stressors and traumas that impacts a specific developmental stage and may proliferate across the development is more severe traumatization dynamics than the exposure to a single trauma, that may be an illusion of the last straw that broke the camel's back. It is important to identify stressors that impact each stage and their cumulative dynamics over the life span. In DBTF taxonomy, the severity of stressors type is categorized on a scale from I to III. Type I is a single blow that happened with a limited timescale, such as a car accident. Type II is a sequence of events that happened and stopped, such as sexual abuse. Type III is the continuous traumas/stressors with prolonged time scales that may continue through life. Type III traumas have subtypes or variants that fall under the broader umbrella term of type III trauma, varying in severity and time scale. Discrimination and intersected discrimination represent a type III-a trauma subtype. The type III-b subtype includes exposure to continuous childhood adversities as in the foster care experience. Ongoing intergroup conflicts represent the type III-c trauma sub-type. Chronic community violence represents type III-d, while uncontrolled prolonged medical health conditions such as COVID-19 represent the Type III-e trauma sub-type. Type III traumas can intersect and amplify each other, as in the case of the discrimination (type

III-a) and COVID-19 (type III-e) intersection (Kira, 2021; Kira et al., 2021c; Solomon & Heide, 1999; Terr, 1995). The macro-dynamics of intersection, poly-victimization, accumulation, and proliferation, and the interaction among pre-identity, identity, and post-identity stressors and traumas determine their total health, mental health, and cognitive impact from a life-course perspective (e.g., Kira, 2001, 2010, 2021; Kira et al., 2012a, 2012c, 2012d, 2013, 2014a, 2014b, 2018a, 2018b, 2019a, 2019b, 2019c, 2019d, 2020d, 2021e; Kira, Barger et al., 2019, 2020).

Different stressors (acute/traumatic and chronic/non-acute) cluster around developmental trajectories and constitute different types. Clustering of the different stressors and traumas around meaningful developmental milestones is essential for conceptual and clinical reasons. Conceptually, a single stressor or trauma can be just the last straw that broke the camel's back or the last rice that tipped the scale. To understand the driving dynamics and increase reproducibility, we may need to adopt an approach that does not test only single associations but compare models representing the outcome-generating mechanisms. Clinically, developing treatment models should be based on the outcome-generating dynamics and not on the last straw or the single rice that tipped the scale.

According to the DBTF framework, there are at least six major stressor clusters/types: Attachment stressors/traumas, personal identity stressors/traumas, collective identity stressors/traumas, physical survival stressors/traumas, role identity stressors/traumas and secondary and tertiary (cross-generation transmission) stressors/traumas. These stressor/trauma types proliferate from the earlier to the subsequent with the earlier (attachment traumas, followed by early childhood adversities and intersected discrimination) proliferate to later adversities with amplification of their impact on health, mental health, and cognitive functioning. We will briefly discuss each stressors cluster/type.

## 2. Attachment Stressors/Traumas

Early abandonment by one parent or both, especially the mother's abandonment in the early three years of life, is an existential threat for the developing infant (Bowlby, 1979). The life of the infants depends entirely on this relationship. Early relational trauma can result in disorganized, ambivalent, avoidant, and unhealthy attachment styles that stay with the person the rest of life, affecting negatively his/her relationship with others, increasing vulnerability to early childhood adversity and other interpersonal traumas and their negative sequelae (e.g., Spinazzola et al., 2018, 2021). Attachment trauma proliferates this way to other trauma types (Kira et al., 2019b). The robust empirical evidence on the adverse effects of unhealthy attachment styles (e.g., for meta-analysis see: Vasileva & Petermann, 2018), attachment trauma and depression (for meta-analyses see; Spruit et al., 2020; Zheng et al., 2020), and for attachment trauma and PTSD (for meta-analysis see: Woodhouse et al., 2015). There is also robust evidence on the positive effects of secure attachment on resilience, emotion regulation, and well-being (e.g., Barnum & Perrone-McGovern, 2017, for meta-analyses for its link to

resilience, see: Darling Rasmussen et al., 2019; and for its link to self-regulation see: Pallini et al., 2018). There is evidence that attachment traumas are also associated with deficits in attention and cognitive functioning (for meta-analysis on their association with attention deficits, see: Pallini et al., 2019).

### 3. Identity (Personal and Collective) Trauma Model

**Personal identity stressors/traumas:** Personal identity traumas are events that challenge the existence of the self as an autonomous, independent agent like physical and sexual abuse or abduction, bullying; emotional abuse; physical neglect, and general maltreatment. Most early childhood adversities belong to this stressors/trauma type. However, this type also includes some adulthood traumas such as rape and domestic violence that question the individual executive ownership of her/his body and self decision-making. Early childhood trauma is associated with adult mental disorders (for meta-analysis, see: McKay et al., 2021). They are associated with depression (for meta-analyses, see Humphreys et al., 2020; Peyrot et al., 2018). Sexual and physical abuse in childhood is associated with depression and anxiety over the life course (For meta-analysis see; Lindert et al., 2014). Early childhood adversities increase the risk of psychosis (for meta-analysis see: Peh et al., 2019; and Varese et al., 2012). Meta-analysis found that a significant percentage of children and adolescents develop PTSD after childhood trauma exposure, with those exposed to interpersonal trauma and girls are at particular risk (Trickey et al., 2012). They are also associated with an increased risk of suicide (for meta-analysis, see: Zatti et al., 2017). Childhood adversities are associated with neuropsychological dysfunction and PTSD (for meta-analysis, see: Malarbi et al., 2017).

Intimate partner violence (IPV) is a traumatic experience for the parent victim (and the perpetrator) and their children. A recent meta-analysis found that depression, anxiety, PTSD, antisocial PD, and borderline PD were significantly correlated with IPV victimization and perpetration. Anxiety and PTSD were significantly stronger correlates for victimization than for perpetration, and borderline PD and antisocial PD were significantly stronger correlates for perpetration than for victimization (Spencer et al., 2019).

**Collective identity stressors/traumas:** Collective identity stressors/traumas are the events or the conditions that threaten the existence or status of one of the person's social identities (Kira, 2020). Different discrimination types that target one or more of the person's social identities are examples of such collective identity stressors and traumas. More than 30% in the USA report having experienced lifetime discrimination (Kessler et al., 1999). Discrimination is continuous traumatic stress that starts early in adolescence and continues with the person, as long as he/she possesses this identity. The status of self and identity is salient and underlies discriminative acts' dynamics (Kira, 2019; Kira et al., 2019d). Existential anxieties about the person and group statuses that may be the core-specific anxiety in various discrimination types were rarely studied (Kira et al., 2018b, 2019c,

2020a; Kira, Templin et al., 2012). The extreme lowering of status in the hierarchy can yield vicious dynamics that prevent the person from achieving his/her potentials. Examples of such vicious dynamics are lower self-esteem (de Freitas et al., 2018; Kira et al., 2015; Kucharska, 2018) and self-efficacy (de Freitas et al., 2018), internalized inferiority (for meta-analysis see: Gale et al., 2020), stereotype threat (e.g., Inzlicht et al., 2012), and lower will to live and survive (Kira & Shuwiekh, 2021; Kira, Özcan et al., 2021d; Kira, Ayna et al., 2021c). Discrimination comprises microaggressions (e.g., implicit and explicit insults to identity status and exclusion) (Sue & Spanierman, 2020) and macroaggressions such as hate crimes, police brutality, and systemic racism. Macro-aggressions are primary traumas for the directly targeted person and secondary or tertiary (across generations) for those not directly targeted.

Group-based discrimination is associated with poor physical and psychological health (e.g., Pascoe & Richman, 2009; Williams & Mohammed, 2009). It was associated with hypertension (Dolezsar et al., 2014), inflammation (e.g., Lewis et al., 2010; Zahodne et al., 2019), cardiovascular events (Everson-Rose et al., 2015), and mortality (Barnes et al., 2008). It was associated with depression, anxiety (Schmitt et al., 2014). The research found that ethnic discrimination is a risk factor for psychotic disorders (Bardol et al., 2020). Discrimination's negative impacts on cognition in different age groups are well documented (e.g., Díaz-Venegas et al., 2016; Zahodne et al., 2021; Kira et al., 2020d).

Intersected discrimination is the cumulative impact of exposure of some or all different types of discrimination in a person or a group. Various discrimination types targeting the same individual add and interact with one another, amplifying their cumulative impact (Abu Ras et al., 2021; McClendon et al., 2021; Seng et al., 2012; for meta-analysis of the mental health impact of intersected discrimination, see Vargas et al., 2020). The non-criterion "A" stressors that include intersected discrimination explained over six-fold of the criterion "A" stressors and fully mediated their effects on PTSD symptoms (Kira et al., 2018a, 2019b).

Physical survival stressors/traumas: Physical survival traumas are events that threaten the physical existence (the life) of the person, such as car, boat, train, airplane accident, a severe accident at work or home, natural disaster, life-threatening illnesses. Another person has not perpetrated such traumas (Kessler et al., 1995, 2005). However, such non-interpersonal trauma occurs in a social context (Breslau et al., 1999; McLaughlin et al., 2013), and physical survival trauma can happen through interpersonal interaction, like those perpetrated by enemies or during personal and group conflicts and wars, or by criminals.

Role identity stressors/traumas: Role achievement (or role identity) trauma are events that pose existential threats to the person's current and future achievements that structure the person's meaningful role in life (or role identity) that he/she appreciates, such as suddenly get fired from the job, long-term unemployment and chronic school failures, or significant business loss. The harmful

effects of unemployment on health and mental health are well documented. Unemployment was associated negatively with health status and a significantly higher cardiovascular risk (Noelke et al., 2015), and increased mortality risk (for review and meta-analysis see: Roelfs et al., 2011). It was associated with a greater incidence of suicide (for review and meta-analysis, see: Milner et al., 2014). Long-term unemployed have at least twofold risk of mental illness, particularly depression, anxiety, and other mental disorders (for meta-analysis see: Rönnblad et al., 2019). There is evidence of the association between business performance and suicide (e.g., Abdou et al., 2020). There is empirical evidence of the deleterious effects of the recessions on mental health and suicide rates (e.g., Haw et al., 2015). The harmful effects of school failures on mental and physical health and suicide rates are well documented (e.g., Castellví et al., 2020). School absenteeism was associated with self-harm and suicidal ideation in young people (Epstein et al., 2020).

#### 4. Interdependence Stressors and Traumas (Secondary and Tertiary Traumas)

Secondary and tertiary stressors/traumas: Secondary trauma, indirect trauma, vicarious trauma (McCann & Pearlman, 1990), compassion fatigue (Figley, 1995; Kira, 2001, 2004) are terms used to describe an event that did not happen to you but affected you through different channels and mechanisms. The concept and dynamics of secondary traumas need conceptual clarity. Most research focused on the effects of secondary traumas on professionals working with traumatized clients; however, the concept of secondary trauma and related dynamics apply to professionals as well as all significant others (spouses, parents, children, group of belonging members) exposed to others' traumas directly or through different media outlets. Secondary traumas became even more critical with extended globalization dynamics. There is evidence that females have heightened susceptibility to secondary traumas impact (Baum et al., 2014). One of the mechanisms that transmit such trauma is vicarious empathy (such as in vicarious traumas), as in the therapist's case with traumatized clients. Another mechanism is dependence or systemically connected or enmeshed individuals as in a close relationship; for example, what happened to the mother and witnessed by the child will be secondary trauma for the child, as in the domestic violence case. The phenomena of the "folie adieu" (shared psychosis or induced delusional disorder in a close relationship) are an extreme example of these dynamics (Kira, 2001). Another mechanism of transmission is internalized belonging to a social group. For example, what happened to a person because of his/her group membership, such (e.g., torture or hate crimes or police brutality) terrorizes the rest of the group secondarily; for example, in the cases of hate crimes, police brutality, and critical incidents. Another channel of transmission is the tertiary cross-generational transmission, such as in historical traumas. This channel is described as tertiary trauma, as the transmission can happen through at least three generations.

Shared traumas are somewhat related to secondary traumas. Shared trauma occurred when two persons or a group of people experienced similar traumatic events (Tosone et al., 2012) or the same traumatic event/s, as is the case of community-wide traumas, such as political terror, natural disaster, or public catastrophe (Ali et al., 2021), and COVID-19 pandemic (Kira et al., 2021a, 2021b, 2021e, 2021f, 2021g). Shared trauma involves unique dynamics, as it involves experiencing the trauma primarily (first hand or directly) and secondarily through its effects on others who shared similar or the same experience.

While the discussed taxonomy is conceptually plausible, it needs empirical validation of its central assumptions. This study empirically tests the assumption of gradient severity between types I, II, and III traumas and some of the dynamics between these six stressors and trauma clusters. Additionally, we used a measure for cumulative stressors and traumas previously developed (Kira et al., 2008a) based on this taxonomy (see **Appendix 1**). The study conducts an additional test of the measure's validity and its structure. The goal of the current study is to test some of the main parameters of DBTF, precisely the trauma types' paradigm and the trauma primary clusters paradigm. Is type III trauma is the worse considering its impact on mental health and cognitive functioning? Are attachment trauma, personal identity traumas, and collective identity trauma drive the powerful dynamics of trauma proliferation, with attachment trauma the most powerful followed by early childhood and collective identity dynamics?

## 5. Hypotheses

**Hypothesis 1:** Types II and III traumas have higher significant associations with PTSD, depression, anxiety, and executive function deficits' compared to type I traumas. Type III traumas have a higher significant association with these variables compared to type II traumas.

**Hypothesis 2:** Attachment traumas, followed by early childhood adversities and intersected discrimination, proliferate to later adversities with amplification of their impact on health, mental health, and cognitive functioning. Attachment trauma proliferates with high size effects on other trauma types, especially on personal and collective identity traumas. It has a high effect size on mental health (depression, anxiety, and PTSD) and executive function deficits, mostly indirectly through its direct impact and proliferation to other traumas types.

**Hypothesis 3:** Subsequently, personal identity (mostly early childhood adversities) and collective identity trauma (mostly discrimination and intersected discrimination) proliferate to and have moderate size effects on other trauma types (except attachment trauma) and have direct and indirect effects on mental health and executive functions.

**Hypothesis 4:** Role identity trauma proliferates to collective identity and has significant but a small effect size on mental health and executive functions variables.

**Hypothesis 5:** The other trauma types (survival and secondary traumas) have small but significant effect sizes on mental health and executive functions.



## 6. Methods

**1) Participants:** The sample included  $N = 2732$  adults from 11 Arab countries (Algeria, Iraq, Jordan, Kuwait, Lebanon, Libya, Palestinian, Saudi Arabia, Sudan, UAE, and Egypt). Age ranged from 18 - 91, mean = 26.9, and  $SD = 10.01$ , with 69.3% Females, 97.3% were Muslims and 1.4% Christians, .3% Jewish, 1% other. For education, 1.4% reading and writing level, 8.7% high school level, 81.6% college level, and 8.3% graduate studies level. For marital status, 63.2% single 31.% married, 3.2% widowed, .9% divorced. For employment, 27.2% work with the government, 58.1% Students, 6.2% private business, 2.2% retired, and 5.8% unemployed. For socioeconomic status (SES), .7% reported very low SES, 1.2% low SES, 81.3% in the middle, 14.5% high, and 2.3% reported very high SES. For country representation, 30.4% from Egypt ( $N = 831$ ), 10.1% from Kuwait ( $N = 275$ ), 10.3% from Jordan ( $N = 281$ ), 7.6% from Algeria ( $N = 207$ ), 9.7% from Saudi Arabia ( $N = 265$ ), and 8.3% , from Iraq ( $N = 226$ ), and 6.6% from Palestine ( $N = 180$ ), 6.1% from Libya ( $N = 167$ ), 5.1% from Lebanon ( $N = 142$ ), 3.6% from Sudan ( $N = 98$ ), and 2.2% from UAE ( $N = 60$ ).

**2) Procedures:** A team of three core researchers designed the study. The field study team of graduate students from the participating Arab countries administered the questionnaires to participants from January to March of 2021. We chose the eleven Arabic countries: Algeria, Iraq, Jordan, Kuwait, Lebanon, Libya, Palestine, Saudi Arabia, Sudan, UAE, and Egypt, to represent the 22 Arab countries (50%). We used Google Drive and developed a survey link. Once the participant completed the survey, it was sent anonymously to Gmail then downloaded to the Excel file. All questionnaires were administered individually to participants. The questionnaire was administered face to face = 17.5% and online = 82.5%. Participation was voluntary with built-in informed consent; each person took approximately 20 minutes to complete the full questionnaire. The sponsoring university IRB approved the research protocol as part of a cross-cultural study of the impact of COVID-19.

## 7. Measures

**1) Cumulative stressors and traumas scale (CTS-S-36 items; Kira et al., 2008a):** CST-S was developed to measure stressors and traumas identified in the development-based stressors and traumas framework (DBTF) (e.g., Kira, 2001, 2019, 2021; Kira, Shuwiekh et al., 2018, 2019a). The scale is intended to be a comprehensive measure of cumulative stressors and trauma exposure and measures different stressors and trauma categories and their severity types (type I, II, and III). The current alpha of cumulative stressors and traumatic occurrence is .97. The alphas for trauma types 1, II, and III are .84, .86, and .88, respectively. A detailed description of the scale and instruction of its use and scoring is found in **Appendix 1**.

**2) Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-V; Blevins et al., 2015):** PCL-5 is a scale that measures PTSD according to DSM-5 criteria. It

includes 20-questions. Each question is scored on a five-point scale with “0,” signifying “not at all,” and 4 signifying “extremely.” PCL-5 cut-off scores range for probable PTSD is 31 - 33. The measure was previously translated to Arabic and validated (Ibrahim et al., 2018). Cronbach’s alpha reliability of the scale in the current study was .95.

**3) Generalized Anxiety Disorder-7 (GAD-7; Spitzer et al., 2006):** GAD-7 is a 7-item self-report scale that assesses generalized anxiety. Questions are scored on a 4-point scale with (0) indicating “does not exist” and (3) indicating that the symptom exists “nearly every day.” A cut-off point of 15 signifies severe GAD. The measure has a specificity of 82% and a sensitivity of 89%. The measure’s High scores had been strongly associated with functional impairment in multiple domains (Spitzer et al., 2006). The measure was previously translated to Arabic and validated (Sawaya et al., 2016). Cronbach’s alpha for the measure in the current study was .92.

**4) Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001)** is a 9-item measure that assesses depression severity. Items are scored on a 4-point scale with (0) signifying “does not exist” and (3) indicating that the behavior is happening “nearly every day.” A cut-off score ranges from 15 - 19, signifying moderate to severe depression, while a score of 20 and above indicates severe depression. The Arabic version of PhQ-9 was previously translated and validated (Sawaya et al., 2016). Alpha reliability for the measure in the current study was .88.

**5) Post-cumulative trauma disorders (P-CTD) Scale (Kira et al, 2012c).** The 16-item measure was developed in five community and clinic samples of African American and Arab adolescents and adults. It is based on the idea that cumulative stressors and traumas may yield a complex picture beyond the description of the traditional diagnostic categories, especially in minorities and refugees. The CTD is an index measure for comorbid clustered syndromes that assesses 14 different symptoms: depression, anxiety, somatization, dissociation, auditory and visual hallucinations, avoidance of being with people, paranoid ideations, concentration and memory deficits, loss of self-control, feeling suicidal, and feeling like hurting self and have a plan to kill self. The exploratory and confirmatory factor analysis results found support for four factors: Executive control deficits, Suicidality, Dissociation/Psychosis, and Depression/Anxiety/Somatization Comorbidity. The measure has good reliability (ranging from .85 and .98). Test-retest reliability in a 6-week interval was .76. Several studies offered support for its predictive and criterion validity. Different kinds of traumas and cumulative trauma accounted for significant variance as predictors of cumulative trauma disorders (Kira, Templin et al., 2012). For the severity of symptoms, the authors recommended a cut-off point score of  $\geq 22$  for the total score,  $\geq 9$  for comorbid depression/anxiety/somatization Subscale,  $\geq 9$  for comorbid psychotic, and dissociation Subscale. For suicidality symptoms, cluster  $\geq 5$  is the cut-off point score. Alpha for the full scale in the current study was .93, and for its four subscales was .83 for comorbidity, .85 for suicidality, .78 for psychosis/dissociation,

and .75 for executive control deficits.

**6) The Adult Executive Functioning Inventory (ADEXI; Holst & Thorell, 2018)** was used to investigate executive functioning deficits. The ADEXI is a 14-item scale that measures working memory deficits (9 items) (e.g., “I have difficulty remembering lengthy instructions” and inhibition deficits (5 items) (e.g., “I tend to do things without first thinking about what could happen”). The participant is asked to rate the statement on a scale from 1 to 5, with “1” indicates that it is definitely not true, and “5” indicates it is definitely true. A higher score indicates higher deficits and a lower score indicates lower deficits. The ADEXI was explicitly developed to investigate deficits in working memory and inhibition and address the limitations of other rating instruments that often include items overlapped with ADHD symptom levels. This instrument has proven to discriminate well between adults with ADHD and controls (Holst & Thorell, 2018). Alpha for the total scale in current data is .91 and .90 for working memory deficits and .77 for inhibition deficits.

**7) Existential Annihilation Anxiety (Kira et al., 2020b; Kira, Shuwiekh, Kucharska, & Al-Huwailah, 2019).** We used two subscales of the existential annihilation measure. One subscale measures existential annihilation anxiety related to identity status (4 items) and the second subscale measures existential anxiety related to death (3 items). Items scored on a four-point scale, with “0” indicates “completely disagree” and “3” indicates “completely agree”. The measure and its subscales were validated in different languages including Arabic in previous studies. The two subscales have Cronbach alpha reliabilities of .834 for status existential annihilation anxiety subscale and .843 for death existential annihilation anxiety subscale in current data.

## 8. Statistical Analysis

We used IBM-SPSS 22 and Amos 22 software to analyze the data. The inspection of the variables indicated that there are no missing values in the data as the survey was designed such that it was not possible to proceed without entering a response to each item. To verify that trauma types I, II and III are different in their intensity regarding their effects on mental health and cognitive variables, we conducted a zero-order correlation between Type I, Type II, and Type III traumas and measures of PTSD, depression, generalized anxiety, existential status and death anxieties, and working memory and inhibition deficits. The goal was to compare the strength of association between the three trauma types and the mental health and executive function variables. To determine the significance of correlation size differences, we used Lee & Preacher’s (2013), software to calculate the fisher z score to compare correlations (see also Steiger, 1980).

We conducted path analysis, with the six trauma types (attachment, personal identity trauma, collective identity, physical identity survival, role identity, and secondary) as interacting independent variables, and PTSD, depression, generalized anxiety, working memory, and inhibition deficits as interacting outcome

variables. Following Byrne's (2012) recommendations, the criteria for good model fit were a non-significant ( $\chi^2$ ), ( $\chi^2/\text{d.f.} > 2$ ), comparative fit index (CFI) values  $>0.90$ , and root-mean-square error of approximation (RMSEA) values  $<0.08$ . However, we did not utilize  $\chi^2$  criteria as they are sensitive to large sample sizes, and our sample size  $N = 2732$  is considered large (e.g., Meade & Lautenschlager, 2004).

## 9. Results

**1) Correlation results:** All trauma types had significant correlations with PTSD, depression, anxiety, status and death existential anxieties, working memory and inhibition deficits, suicidality, and executive control deficits. Type II had higher associations with all variables than type I, and type III had higher associations with all variables than type II (and type I). The differences in association sizes between variables were significant. **Table 1** presents the correlations between trauma types and the main variables, while **Table 2** presents the z scores of the significance of differences in correlation sizes between trauma types.

**2) Path analysis results:** *Attachment traumas*, directly and indirectly, affected personal identity, collective identity, physical identity (survival), role identity, and secondary traumas. It had direct negative effects on generalized anxiety and PTSD; however, its indirect and total effects are positive and significant. It had indirect effects on depression, working memory, and inhibition deficits. Its direct effects on collective identity traumas accounted for 84% of its total effects. Its direct effects on personal identity trauma accounted for 43% of its total effects. Its direct effects on physical survival traumas accounted for 37% of its total

**Table 1.** Zero-order correlations between trauma types and mental health and executive functions variables.

Variable	1	2	3	4	5	6	7	8	9	10	11	12
1) Type I Trauma	1											
2) Type II Trauma	.76***	1										
3) Type III Trauma	.69***	.88***	1									
4) PTSD	.17***	.20***	.28***	1								
5) Depression	.23***	.27***	.34***	.71***	1							
6) Anxiety	.16***	.19***	.26***	.70***	.78***	1						
7) Status EAA	.20***	.24***	.29***	.45***	.47***	.48***	1					
8) Death EAA	.16***	.21***	.25***	.50***	.51***	.54***	.60***	1				
9) Working Memory Deficits	.09***	.14***	.19***	.43***	.38***	.34***	.23***	.28***	1			
10) Inhibition Deficits	.17***	.22***	.28***	.47***	.42***	.38***	.23***	.30***	.73***	1		
11) Suicidality	.29***	.36***	.40***	.47***	.53***	.47***	.44***	.50***	.250**	.274**	1	
12) Executive control deficit	.20***	.25***	.30***	.62***	.65***	.64***	.421**	.50***	.45***	.43***	.65***	1

Notes: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

**Table 2.** z scores for the significance of the difference in correlations size between types I, II, and III traumas and the main variables in the study.

Variables	The significance of the difference between Type I and type II traumas	The significance of the difference between types II and III traumas
PTSD	z score = -2.31, p(two tails) = .022	z score = -8.82, p(two tails) = .000
Depression	z score = -3.01, p(two tails) = .001	z score = -7.88, p(two tails) = .000
Generalized Anxiety	z score = -2.30, p(two tails) = .02	z score = -7.69, p(two tails) = .000
Status EAA	z score = -3.10, p(two tails) = .002	z score = -5.55, p(two tails) = .000
Death EAA	z score = -3.85, p(two tails) = .000	z score = -4.39, p(two tails) = .000
Working Memory Deficits	z score = -3.80, p(two tails) = .000	z score = -5.41, p(two tails) = .000
Inhibition Deficits	z score = -3.86, p(two tails) = .000	z score = -6.63, p(two tails) = .000
Suicidality	z score = -5.63, p(two tails) = .000	z score = -4.64, p(two tails) = .000
Executive control deficit	z score = -3.88, p(two tails) = .000	z score = -6.13, p(two tails) = .000

effects. Its direct effects on role identity traumas accounted for 40% of its total effects. Its direct effects on secondary traumas accounted for 19% of its total effects. No other traumas affected attachment traumas directly or indirectly, which makes more sense as attachment traumas are the earliest in life and proliferate to all other subsequent traumas. Its total effect size on the other subsequent traumas ranged from high (.74, .73, and .72 for personal identity, collective and secondary traumas) to moderate (.57 for role identity traumas). Its total effect size on depression, PTSD, working memory, and inhibition deficits was small but highly significant.

*Personal identity traumas* had direct and indirect effects on physical identity (survival) traumas, role identity traumas and secondary traumas, and PTSD. It had indirect effects on itself (loop), cumulative identity traumas, depression, working memory, and inhibition deficits. Its direct effects on physical survival traumas accounted for .88 of its total effects. Its direct effects on role identity (achievement/status) trauma accounted for .73 of its total effects. Its direct effects on secondary traumas accounted for .45 of its total effects. Its direct effects on role generalized anxiety accounted for .80 of its total effects. Its direct effects on secondary traumas accounted for .45 of its total effects. Its direct effects on PTSD accounted for .73 of its total effects. Its direct effects on secondary traumas accounted for .21 of its total effects. Its total effect sizes on physical survival traumas (.51), secondary traumas (.47), and role identity trauma (.40) were moderate. Its total effects on collective identity trauma (.09) were small but significant. Its total effect sizes on generalized anxiety (.35), PTSD (.34), depression (.31) were moderate to low but highly significant. Its total effects on inhibition deficits (23) and working memory deficits (18) were low but significant.

*Collective identity trauma*, directly and indirectly, affected personal identity traumas, physical identity (survival) traumas, secondary traumas, and depression. It had indirect effects on itself (loop) and indirect effects on role identity traumas, generalized anxiety, PTSD, working memory, and inhibition deficits.

Its direct effects on personal identity traumas accounted for .95 of its total effects. Its direct effects on physical identity (survival) traumas accounted for .27 of its total effects. Its direct effects on secondary traumas accounted for .33 of its total effects. Its direct effects on depression accounted for .24 of its total effects. Its total effect sizes on personal identity trauma (.60) were high to moderate. Its total effect sizes on the other trauma types were moderate to low. Its total effects on depression, generalized anxiety, PTSD, inhibition, and working memory deficits were on the low side, but all were highly significant.

*Physical survival trauma* had direct and indirect effects on role identity and secondary traumas. It had indirect effects on all the other trauma types (except attachment). It had indirect effects on PTSD, depression, generalized anxiety, working memory, and inhibition deficits. Its direct effects on role (status) identity traumas accounted for .95 of its total effects. Its direct effects on secondary traumas accounted for .91 of its total effects. While its total effect size on secondary traumas is moderate (.42), Its effect sizes on the other traumas and mental health and executive functions are relatively small but significant.

*Role identity (achievement) traumas* affected directly and indirectly collective identity traumas, secondary traumas, generalized anxiety, depression, PTSD, working memory, and inhibition deficits. Its direct effects on collective identity traumas accounted for .96 of its total effects. Its direct effects on secondary traumas accounted for .50 of its total effects. Its direct effects on working memory deficits accounted for .47 of its total effects. Its direct effects on inhibition deficits accounted for .20 of its total effects. All of its total effects were relatively small but significant.

*Secondary traumas* had direct effects on depression, direct and indirect effects on inhibition deficits, and indirect effects on working memory and PTSD. Its direct effects on inhibition deficits accounted for .82 of its total effects. Its total effects in all the affected variables were relatively small and significant.

*Generalized anxiety* had a direct effect on depression, direct and indirect effects on PTSD and indirect effects on working memory and inhibition deficits. Its direct effects on PTSD account for 55% of its total effects. Its total effects on depression and PTSD are large. Its total effects on working memory and inhibition deficits were medium to small. *Depression* had direct medium-size effects on PTSD, direct and indirect (medium to small size) effects on working memory, and inhibition deficits. *PTSD* had direct effects (medium to small) on working memory and direct and indirect effects on inhibition deficits.

We should note that the only traumas that directly affected executive function deficits in this model were role identity and secondary traumas with small effect sizes. However, the direct impact with moderate effect sizes was from depression and PTSD. All other trauma types had an indirect impact on executive functions that ranged from small to medium. **Table 3** presents the direct, indirect and total effects and .95 confidence intervals for each variable in the model. **Figure 1** presents the path diagram of the model with all the direct paths between variables.

**Table 3.** The direct, indirect, and total effects and their 95% confidence intervals of each variable in the model.

Causal Variables	Endogenous Variables									
	PIT	CIT	PST	RIT	General Anxiety	ST	Dep.	PTSD	Working Memory D.	Inhibition Deficits
<b>Attachment traumas</b>										
Direct Effects	.32** (.26/.37)	.61** (.57/.65)	.25** (.18/.30)	.23** (.17/.29)	-.15** (-.23/-.09)	.14** (.09/.18)	—	-.07** (-.11/-.03)	—	—
Indirect Effects	.42** (.37/.46)	.12** (.09/.15)	.43*** (.39/.46)	.34** (.29/.40)	.29** (.23/.34)	.58** (.54/.61)	.21** (.16/.25)	.21** (.16/.24)	.11** (.09/.14)	.18*** (.16/.21)
Total Effects	.74** (.71/.77)	.73** (.70/.77)	.68** (.64/.71)	.57** (.53/.61)	.13** (.08/.18)	.72** (.69/.74)	.21** (.16/.25)	.14** (.09/.17)	.11** (.09/.14)	.18*** (.16/.21)
<b>Personal identity traumas</b>										
Direct Effects	—	—	.45** (.42/.54)	.29** (.21/.35)	.28** (.20/.36)	.21** (.17/.26)	—	.07*** (.04/.11)	—	—
Indirect Effects	.05** (.04/.06)	.09** (.07/.11)	.06*** (.04/.06)	.11** (.08/.14)	.07** (.05/.09)	.26** (.22/.29)	.31** (.26/.36)	.27** (.22/.32)	.18*** (.16/.22)	.23*** (.20/.25)
Total Effects	.05** (.04/.06)	.09** (.07/.11)	.51** (.46/.59)	.40** (.33/.46)	.35** (.29/.42)	.47* (.41/.51)	.31** (.26/.36)	.34** (.29/.41)	.18*** (.16/.22)	.23*** (.20/.25)
<b>Collective identity traumas</b>										
Direct Effects	.57** (.52/.62)	—	.10** (.04/.15)	—	—	.15** (.10/.19)	.06** (.03/.09)	—	—	—
Indirect Effects	.03** (.02/.04)	.05*** (.04/.07)	.29** (.25/.33)	.25** (.20/.28)	.20*** (.17/.24)	.31** (.25/.34)	.19** (.16/.23)	.23*** (.20/.26)	.12** (.10/.14)	.17** (.15/.19)
Total Effects	.60** (.55/.66)	.05*** (.04/.07)	.39** (.33/.44)	.25** (.20/.28)	.20*** (.17/.24)	.46** (.41/.51)	.25** (.21/.30)	.23*** (.20/.26)	.12** (.10/.14)	.17** (.15/.19)
<b>Physical survival traumas</b>										
Direct Effects	—	—	—	.19** (.14/.23)	—	.38* (.34/.41)	—	—	—	—
Indirect Effects	.02** (.02/.03)	.04** (.03/.06)	.02** (.01/.02)	.01** (.01/.01)	.04** (.02/.05)	.04** (.02/.05)	.06** (.04/.08)	.05** (.04/.06)	.04** (.03/.05)	.08** (.06/.09)
Total Effects	.02** (.02/.03)	.04** (.03/.06)	.02** (.01/.02)	.20** (.15/.24)	.04** (.02/.05)	.42* (.37/.45)	.06** (.04/.08)	.05** (.04/.06)	.04** (.03/.05)	.08** (.06/.09)
<b>Role identity traumas</b>										
Direct Effects	—	.21** (.16/.26)	—	—	.14** (.09/.18)	.10** (.07/.15)	.04 (.00/.08)	.04 (-.00/.07)	.08** (.04/.11)	.04* (.00/.06)
Indirect Effects	.13** (.09/.16)	.01** (.01/.02)	.08** (.06/.10)	.05*** (.04/.06)	.04** (.03/.06)	.10** (.06/.12)	.17** (.12/.20)	.16** (.12/.19)	.09** (.07/.11)	.16** (.13/.19)
Total Effects	.13** (.09/.16)	.22** (.17/.28)	.08** (.06/.10)	.05*** (.04/.06)	.18** (.13/.22)	.20** (.16/.23)	.21** (.15/.25)	.20** (.15/.25)	.17** (.13/.20)	.20** (.16/.24)

## Continued

<b>Generalized anxiety</b>										
Direct Effects	—	—	—	—	—	—	.75** (.72/.76)	.36** (.32/.41)	—	—
Indirect Effects	—	—	—	—	—	—	—	.30** (.26/.33)	.31** (.28/.33)	.32** (.30/.35)
Total Effects	—	—	—	—	—	—	.75** (.72/.76)	.66** (.64/.63)	.31** (.28/.33)	.32** (.30/.35)
<b>Secondary Traumas</b>										
Direct Effects	—	—	—	—	—	—	.06* (.02/.10)	—	—	.09** (.05/.12)
Indirect Effects	—	—	—	—	—	—	—	.02* (.01/.04)	.02* (.01/.04)	.02* (.01/.03)
Total Effects	—	—	—	—	—	—	.06* (.02/.10)	.02* (.01/.04)	.02* (.01/.04)	.11** (.06/.14)
<b>Depression</b>										
Direct Effects	—	—	—	—	—	—	—	.40** (.36/.44)	.14** (.09/.18)	.06** (.02/.08)
Indirect Effects	—	—	—	—	—	—	—	—	.13** (.10/.14)	.22** (.19/.26)
Total Effects	—	—	—	—	—	—	—	.40** (.36/.44)	.27** (.22/.30)	.28** (.23/.30)
<b>PTSD</b>										
Direct Effects	—	—	—	—	—	—	—	—	.31** (.26/.35)	.13** (.08/.15)
Indirect Effects	—	—	—	—	—	—	—	—	—	.20** (.17/.23)
Total Effects	—	—	—	—	—	—	—	—	.31** (.26/.35)	.33** (.28/.37)
<b>Working memory deficits</b>										
Direct Effects	—	—	—	—	—	—	—	—	—	.64** (.62/.67)
Indirect Effects	—	—	—	—	—	—	—	—	—	—
Total Effects	—	—	—	—	—	—	—	—	—	.64** (.62/.67)
Squared R	.729	.605	.603	.463	.084	.749	.628	.558	.197	.585

Notes: \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Notes: PIT = personal identity traumas; CIT = Collective identity traumas; PST = Physical survival traumas RIT = Role identity traumas; ST = Secondary traumas; Dep. = Depression.

## 10. Discussion

The study provided evidence for the validity of some of the main parameters of DBTF. It is the first study that provided empirical evidence of the types I, II, and III traumas as a measure of the gradient impact severity of each trauma type,



N =2732 -11 Arab countries  
 Chi Square = 66.445, d.f.= 20, p=.000  
 CFI = .998  
 RMSEA=.029

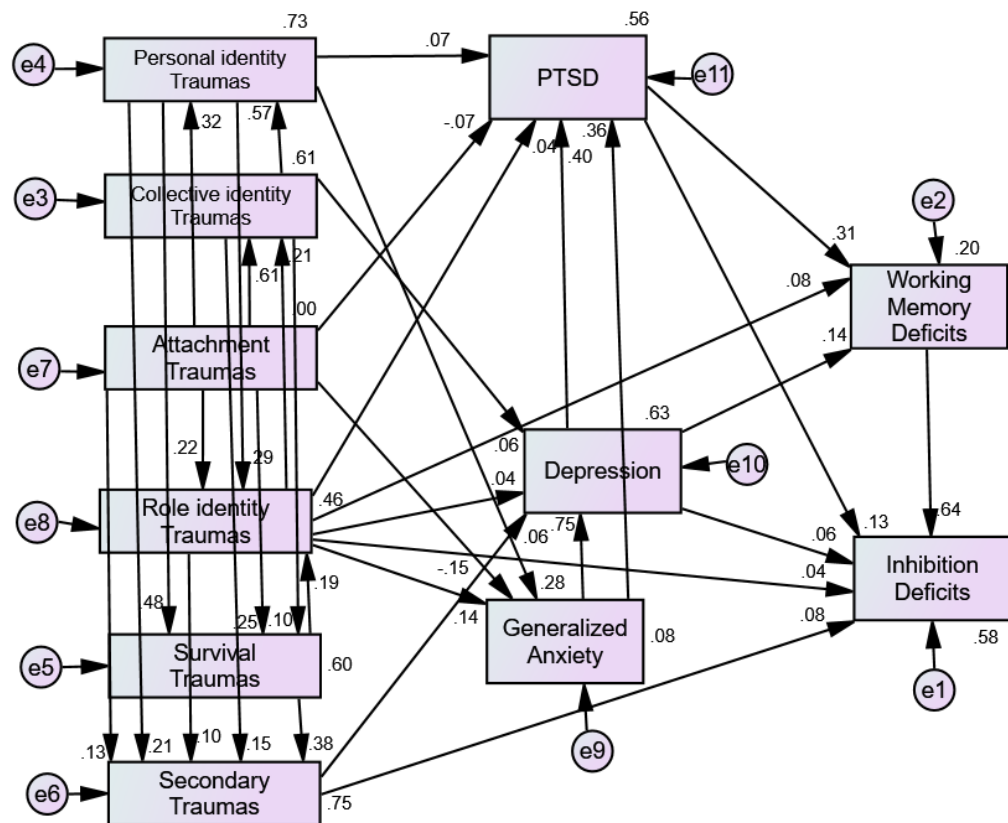


Figure 1. Path diagram with all the direct paths between variables in the model.

with type III trauma, e.g., discrimination, has the worst impact on mental health and executive functions compared to types I and II. The results replicated and extended previous findings on the impact of discrimination as the worse trauma types considering its impact on minorities (Kira et al., 2008b). Discrimination is a continuous life trauma contributing to persistent disparities in morbidity and mortality rates among minority groups. Additionally, the study provided further evidence for the proliferation of early traumas, with attachment, personal identity (early childhood adversities), and collective identity traumas leading the proliferation to other trauma dynamics. That replicated and extended previous findings on trauma and stress proliferation dynamics (Kira et al., 2018a; Pearlin et al., 1997). Also, attachment traumas have a larger effect size in the trauma proliferation dynamics. However, while attachment traumas have the largest effect size on other traumas, personal identity trauma and collective identity trauma had the highest impact on mental health and cognitive functioning. The signifi-

cant impact of attachment trauma on mental health and cognitive functioning is primarily indirect, mediated by its high impact on other trauma types.

The study results have significant conceptual, stress and trauma measurement, and clinical implications. Conceptually, the potentials of DBTF in transforming the landscape of stress and trauma research are yet to be fully harnessed. We advance various assertions regarding the nature of stress and trauma from a developmental perspective. First, the single trauma-focused approach on conceptualizing and treating traumatization outcomes may be missing the mark of the whole picture and the powerful dynamics of traumatization that drive the interaction of stressors (acute and non-acute), individual development, and behavior. Interacting stressors and traumas factors and processes matter for the developing individual till the end of life. Second, the intensity of stressors (acute, traumatic, or chronic) is essential in predicting their outcome, with continuous stressors (traumatic and chronic) (type III) such as discrimination and early childhood adversities being the worse regarding their impact on mental health and cognitive functioning. Third, in real life, poly-traumatization, severe trauma, and cumulative trauma, in multiply severely traumatized rarely present its outcome in a single diagnosis, but rather in a syndrome or profile of comorbidity, including PTSD, complex PTSD, depression, anxiety, suicidality, and executive function deficits. We should instead identify profiled syndromes to address them more effectively in treatment. Finally, the focus on mortality salience and physical traumatization alone, ignoring the existence's salience of the developing identity with its complex structure and dynamics that exist in time and space, is not a tenable position that allows us to understand the phenomena of traumatization in real-time and real-life and its impact on minorities and non-minority populations. It is time to re-focus and reconceptualize the field of stress and trauma around the person's development with diverging salience of both her/his developing existence (identity) and mortality.

From the stressors and traumas measurement perspective, while not primarily intended in the study design, the current study provided strong evidence that cumulative stressors and traumas measure has robust psychometrics and provided evidence of its construct and predictive validity of all its primary measured constructs. The measure was initially developed (22 and 32 items) based on the DBTF framework (Kira et al., 2008a). The furtherly developed version we used in the study is currently 36 items with more representative items of the basic constructs of DBTF (the current version is attached as **Appendix 1**).

Clinically, the results have significant implications for precision intervention and prevention. Preventive social interventions that prevent or minimize attachment and early childhood traumas and interventions that suppress early on attachment and childhood traumas proliferation may be helpful. Attachment trauma-focused, early childhood trauma-focused, identity-focused, and continuous trauma-focused (type III traumas) interventions may be developed to supplement the current evidence-based packages. The current single trauma-focused

intervention seems to have limited efficacy. For example, a meta-analysis concluded that recommended interventions appear less effective at relatively low and high patient PTSD severity levels (Haagen et al., 2015). Current intensive interventions to treat and prevent suicide did not stop the spiral escalation of suicide rates (Goldston et al., 2015; Luby & Kertz, 2019). Identity-focused and continuous trauma-focused interventions (e.g., Eichas et al., 2015; Kira et al., 2015a; Umaña-Taylor & Douglass, 2017) proved helpful. Attachment-focused interventions need to be further developed (e.g., Berlin, 2005; Steele & Steele, 2017). Considering that executive function deficits were a significant outcome of different trauma types and their associated mental health syndromes, any treatment package may include cognitive training and other intervention that enhance executive functions. Cognitive training (for meta-analysis: Jahn et al., 2021) and acute exercise training (e.g., Pontifex et al., 2021) that enhance executive functions can be some of the keys to their treatment. Research into cognitive functions across psychological disorders suggests that multiple disorders may present cognitive deficiencies, potentially pointing to a transdiagnostic phenomenon (Abramovitch et al., 2021).

The current study had various limitations. The study was conducted in a convenient sample using a cross-sectional design. Cross-sectional design can report an association with no conclusions on cause and effects that only longitudinal design can achieve. Further, the measures used are based on participants' self-reports. Self-reports are subject to under-or over-reporting due to social desirability. We used a self-report measure, not a performance measure, to test for executive functions. However, previous research has demonstrated that task-based and self-report measures of EF capture complementary yet distinct components of cognitive control (Snyder et al., 2020). Further, we must caution that the direct and indirect effects used in path analysis do not mean the same thing in the deterministic sciences of cause and effect. Regardless, the study provided evidence that demonstrated the dynamics of intersected discrimination on COVID-19 infection and stressors in minorities.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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## Appendix 1

### Cumulative Trauma Scale (Short Form)

#### Directions:

Many people have experienced different kinds of events and situations in their lives. The following questions will ask you about some specific events; please indicate how many times happened if happened and how much it affected you negatively or positively on the provided scale.

1) In my life, I witnessed or experienced natural disasters, e.g. earthquakes, hurricanes, tornados, or floods.

**Never          once          two times          three times          many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

2) I have experienced a life-threatening accident, e.g., motor vehicle accidents.

**Never          once          two times          three times          many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

3) I have been involved in or exposed to war or combat.

**Never          once          two times          three times          many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

4) I have experienced the sudden death of one of my parents or a close friend or loved one.

**Never          once          two times          three times          many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how much this affected you:

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

5) I have experienced a life-threatening or permanently disabling event for loved ones (e.g., parents, close friends).

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened how, has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

6) I have experienced life-threatening illness or permanently disabling event (e.g., cancer, stroke, serious chronic illness, or major injury).

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

7) I have experienced robbery involving a weapon (robbed or mugged).

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how much this affected you:

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

8) I witnessed a severe assault of an acquaintance or stranger (e.g., got shot, stabbed, or severely beaten up).

**Never once two times three times many times**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

9) I have been threatened to be killed or to be seriously harmed.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

10) I have been physically abused, pushed hard enough to cause injury, or beaten up by a caretaker, e.g., parent...

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

11) I witnessed heard one of my parents or caregivers hitting, hurting, and threatening to kill my other parent or caregiver.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

12) I was led to sexual contact with someone older than me.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

13) I was sexually abused or raped or involved in unwanted sex with one or more persons.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

14) I have been jailed and/or tortured.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

15) My mother had abandoned or left/or separated from me when I was very young.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

16) My father had abandoned or left me or separated from me when I was young.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

17) I was put down, threatened, or discriminated against by some others' negative attitudes, stereotypes, or actions because of my ethnicity, race, culture, religion, or national origin.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

18) My parents went through divorce and or separation.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

19) My race has a history of being oppressed, discriminated against, or threatened by genocide.

Never (1) little like it (2) partially like it (3) moderately like it (4) very much like it (5)

- If this happened, how old you were when the first was aware of it?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7



20) I have experienced a nervous breakdown or felt that I was about to have one (e.g., about to lose control) due to seemingly small but recurrent or unremitting hassles or chronic stressors.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

21) At least one of my parents or siblings was involved in war, combat, or being tortured.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

22) I experienced frequent failures in school.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

23) I was uprooted and forced to move from my intimate environment in town, village, or country.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

24) I have been physically attacked, beaten up by another stronger person or group of persons, and caused an injury.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

25) I was led to sexual contact with one of my caregivers/parents.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

26) I was put down, denied my rights, or discriminated against in the society (not by family members), by some others' negative attitudes, stereotypes, or behaviors, or by institutions because of my gender (being a girl/woman or a boy/man).

**Never once two times three times many times.**

- If this happened, how old you were when the first time you become aware of it?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

27) I experienced serious rejection or failure in my relationships.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

28) I experienced the loss of a child or spouse.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

29) I experienced sudden unexpected employment termination, been laid off, or failed in business or big market loss.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

30) I remarried.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

31) I experienced being part of a low-income family with many hardships.

0 Never poor (1) somewhat poor (2) poor (3) very poor (4) extremely poor

- If this happened, how old you were when the first time you were aware of it?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

32) I was put down, threatened, or discriminated against by some other family members (e.g., parents, siblings) negative attitudes, stereotypes, or actions because of my gender: being a boy or girl.

**Never once two times three times many times.**

- If this happened, how old you were when the first you experienced it?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
1	2	3	4	5	6	7

33) I have had to harm another person.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative

34) I lived in a community full of violence and criminal activities.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

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Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
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35) I have been discriminated against because of my sexual preference.

**Never once two times three times many times.**

- If this happened, how old you were when the first one happened?
- If this happened, how has this affected you?

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Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
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36) I have been told that my birth was complicated.

**(0)Never (2) difficult (3)complicated (4)very complicated (5)extremely (life-threatening)**

- If this happened, how old you were when you were told of it?
- If this happened, how had this affected you?

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Extremely positive	Very positive	Somewhat positive	Neutral	Somewhat Negative	Very Negative	Extremely Negative
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***Instructions for Users with different age groups:***

- Children (age 8 - 11): delete items 14, 19, 28, 29 and 30,
- Adolescents (12 - 18 years old) delete items, 28, 29, and 30, interview the child or parents as appropriate,
- For younger children (age 1 - 7), you can interview one of the parents or the caregiver as appropriate.
- You can use all the parameters of the questions (occurrence, frequency, age, and appraisal) or only one or more according to the assessment and research goals.
- You can use the items and subscales or only selected subscales according to the assessment or research goals.
- The interview format is the preferred format for children and illiterate adults and adolescents. Paper and pencil format is the preferred format for literate adults and adolescents. (Interview format are plausible for all age groups based on the research design)

**Scoring**

**Suggested Measures:**

**For each of the following suggested measures you can generate:**

- 1) Occurrence scale (first parameter). (happened vs. not happened).
- 2) Frequency Scale (second parameter). (if happened how many times).
- 3) Negative Appraisal (recode appraisal: 5 = 1, 6 = 2, 7 = 3).
- 4) Positive (or non-negative) Appraisal (recode appraisal: 4 = 1, 3 = 2, 2 = 3, 1 = 4).

5) Age when the trauma first happened parameter.

**Subscales:**

Gender Discrimination = 26 + 32

Personal identity trauma = (12 + 13 + 25) + 24 + 27 + 10

A. *Sexual abuse* = 12 + 13 + 25

B. *Physical abuse* = 10 + 24

Collective identity Trauma (social structural violence) = 17 + 19 (+31) + 14 + 35 + (26 + 32)

A. *Discrimination* = 17 + 19 + 35 (26 + 32)

B. *Poverty* = (31)

*Torture* = 14

*Uprootedness* = 23

Attachment Trauma = 15 + 16

Achievement (Role Identity) Trauma = 22 + 29

Survival Traumas = 1 + 2 + 3 + 6 + 7 + 9

Secondary Traumas = 4 + 5 + 8 + 11 + 18 + 21 + 28

Cumulative Stressors and Traumas = 1- 36

*Cumulative non-traumatic Stressors* = 20, 23, 30

Perpetration Trauma = 33

Community Violence = 34

Birthing Trauma = 36

Measures for trauma types

Type I traumas

1, 2, 4, 7, 8, 28 (6 items)

Type II Traumas

3, 10, 12, 13, 14, 15, 16, 22, 24, 25, (10 items)

Type III Traumas

6, 10, 17, 19, 26, 31, 32, 34, 35, 36 (10 items)

Type IV Traumas = 1- 36

- Note: We excluded the non-traumatic chronic stressors and some of the secondary traumas from the trauma types to make the difference in intensity clear. For item 24. If the physical abuse is one event, it is type I, if it was recurrent and the frequency of happening was more than one, then we consider it to be type II.
- Accordingly item 24\*, If it was one event, then it is type I, if the frequency is more than one time, then it is type II.

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## Description of the Measure

Cumulative stressors and traumas scale (CTS-S-36 items; Kira et al., 2008): CST-S is developed to measure stressors and traumas identified in the development-based stressors and traumas framework (DBTF) (e.g., Kira, 2001; Kira, 2019; Kira, 2021; Kira, Shuwiekh, et al., 2018; Kira, Shuwiekh, et al., 2019). The scale is intended to be a comprehensive measure of cumulative stressors and trauma exposure. Cumulative non-traumatic stressors included the severe life changes associated with widowed/ divorce and re-marrying, the significant life changes in forced relocations (e.g., uprootedness and immigration), and the experience of seemingly minor but recurrent or unremitting hassles or chronic stressors. The scale includes, in addition to cumulative non-traumatic stressors (3 items), seven major trauma types (acute stressors): collective identity trauma (3 items), personal identity trauma (6 items), survival trauma (6 items), attachment trauma (2 items), secondary trauma (7 items), achievement traumas (2 items) and gender discrimination (2 items). Recently, the scale developers added three items that measure: perpetration trauma, community violence, and birthing trauma (complicated birth) as optional items for interested researchers. Collective identity trauma includes trauma-related exposure to war and torture and discrimination based on race, ethnicity, or national origin. Personal identity trauma includes trauma related to sexual abuse, rape, incest, and being robbed. Attachment trauma includes abandonment by parents. Survival trauma includes car accidents, life-threatening illnesses, and natural disasters. The achievement or role identity trauma is intended to measure traumatic stressors related to achieving life goals like success in school or business. Secondary trauma includes witnessing a traumatic event occurring to another individual or group and affecting social interdependence. Gender discrimination includes gender discrimination by parents (family) and gender discrimination by society and institutions. Gender discrimination items are worded to apply to both genders. In response to each item on the measure. The scale groups various traumas considering their severity to three types of traumas: types I, II, and III traumas.

Additionally, the scale contains three items that assess chronic hassles and significant life non-acute stressors and subscale for intersected discrimination). The CST-S assesses cumulative stressors and traumas concerning their frequency, their mere occurrence, types, age of happening, and their appraisals (negative and positive). In this short study, we used only frequency and occurrence questions. In answering each question on the scale, participants were asked to describe their involvement with an event on a 5-point Likert-type scale (0 = never; 4 = many times). The CST-S consists of two overall measures for cumulative stressors and traumas' dose: occurrence and frequency. Researchers can compute subscales for each of the stressor/trauma types or use individual items as indicators of the experience of such an event. The CST-S has shown adequate internal consistency ( $\alpha = .85$ ), and test-retest stability (.95 in 4 weeks), and convergent, and divergent and predictive validity in different studies (e.g., Kira, Barger et al., 2019; Kira, Barger et al., 2020; Kira, Fawzi et al., 2013; Kira et al., 2019; Kira et al., 2018). The current alpha of cumulative stressors and traumatic occurrence is .97. In a further development, three optional items included community violence, birthing trauma (complicated birth), and perpetration trauma. Participants are instructed to indicate their experience with a traumatic event on a 5-point Likert-type scale (0 = never; 4 = many times). If a participant denotes that she/he has experienced the traumatic event, then he/she is asked to describe her/his appraisal of its effect on a 7-point Likert-type scale (1 = extremely positive; 7 = extremely negative). CTS-S includes two general subscales for cumulative trauma dose: occurrence and frequency of experience, and two appraisal subscales: negative and positive appraisal of events. These four sub-scales may also be generated for each of the trauma types.

The CTS-S has shown adequate internal consistency ( $\alpha = .85$ ; Kira et al., 2008, Kira, Fawzi et al., 2013). Evidence of the instrument's predictive validity includes cumulative trauma significantly predicting post-traumatic stress disorder ( $r = .54, p < .001$ ), cumulative trauma-related disorders ( $r = .24, p < .001$ ), and poor health ( $r = .37, p < .001$ ; Kira et al., 2008). CTS-S has also shown divergent validity: It was significantly negatively correlated with sociocultural adjustment ( $r = -.25, p < .001$ ) and futuristic orientation ( $r = -.37, p < .001$ ). CTS-S has been used with a variety of

clinical and community samples of adults and adolescents from numerous sociocultural groups and has been shown to possess adequate reliability (with an alpha ranging between .80 and .92), good construct validity (e.g., Kira et al., 2008, Kira, Lewandowski, Somers, Yoon, & Chiodo, 2012; Kira, Smith, Lewandowski, & Templin, 2010), and validity across different cultural and clinical groups, including American Indians, Mayans, Palestinians, Egyptians, refugees, and torture survivors from 32 countries (e.g., Kira, Ashby, Odenat, & Lewandowski, 2013; Kira, Barger et al., 2019, 2020; Kira, Fawzi et al., 2013; Kira, Omidy, & Ashby, 2014; Kira et al., 2010). The measure has been used in several studies as a comprehensive measure of stress and trauma (e.g., Bedoya et al., 2020; Eltan, 2019; Gillespie & Gates, 2013; Head, Singh, & Bugg, 2012; Lee, & Lee, 2018; Millender, 2013; Omidy, 2012; Rizeq, Flora, & McCann, 2018; Robles et al., 2009), and has been found to have good reliability and predictive validity. It has been translated into different languages, including Arabic, Spanish, Polish, Korean, Turkish, and Nigerian, and proved to have good psychometric properties in these languages. Test-retest using an independent sample with four-week intervals yielded excellent stability coefficients (.995 for cumulative trauma frequency and .997 for cumulative trauma appraisal). The alpha for the main scale of occurrence was .88 in Egyptian data and .91 in Polish data.

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