Intergenerational Trauma and Cognition

by
Darryl Ray

A THESIS

submitted to
Oregon State University
Honors College

in partial fulfillment of
the requirements for the
degree of

Honors Baccalaureate of Science in Psychology
(Honors Associate)

Presented May 27, 2021
Commencement June 2021

AN ABSTRACT OF THE THESIS OF

Darryl Ray for the degree of Honors Baccalaureate of Science in Psychology presented on May 27, 2021. Title: Intergenerational Trauma and Cognition

Abstract approved:_____

Kathryn Becker-Blease

This review investigated the cognitive effects of intergenerational trauma. Through a literature review, 622 articles across two databases were examined using bibliography and literature review software to analyze such effects. Six articles were identified and discussed as well as their implications for future research. The supporting articles demonstrated clear cognitive effects on offspring as a result of intergenerational trauma. Though few in number, their findings are significant and require further investigation to understand the true impacts of cognition as a pathway for the intergenerational transmission of trauma.

Key Words: intergenerational trauma, cognition, offspring, literature review

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I understand that my project will become part of the permanent collection of Oregon State University, Honors College. My signature below authorizes release of my project to any reader upon request.

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Intergenerational Trauma and Cognition

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Abstract

This review investigated the cognitive effects of intergenerational trauma. Through a literature review, 622 articles across two databases were examined using bibliography and literature review software to analyze such effects. Six articles were identified and discussed as well as their implications for future research. The supporting articles demonstrated clear cognitive effects on offspring as a result of intergenerational trauma. Though few in number, their findings are significant and require further investigation to understand the true impacts of cognition as a pathway for the intergenerational transmission of trauma.

Keywords: Intergenerational trauma, cognition, offspring, literature review

The likelihood that one may experience some kind of trauma in their life remains extremely high. Though the rate may vary, Kilpatrick (2014) cites prevalence rates of someone experiencing trauma within their life as high as 89.7%, according to the DSM-V criteria. These traumatic experiences vastly differ per each individual, and their severities have fluctuating results. However, the effects of such experiences have proven to have emotional, physical, cognitive, behavioral, social, and developmental consequences (Center for Substance Abuse Treatment, 2014). Furthermore, factors such as race, gender, sexual orientation, and socioeconomic status may exacerbate the prevalence of such experiences (Roberts, 2011; Olff, 2017; Roberts 2010; Assari, 2020). Research shows a link between these factors and intergenerational repercussions (DeAngelis, 2019).

Intergenerational trauma is the concept in which the effects of trauma can be passed across generations. This meaning, that trauma would no longer solely affect those who experience it. Instead, it can even have impacts on the survivor's offspring. These impacts can have numerous consequences and even result in first, second, third, or even indefinite generational changes. The transmission of trauma intergenerationally originated as a theory. However, certain studies (Bowers & Yehuda, 2016) unequivocally prove the intergenerational effects of trauma. Detailed in the Administration for Children and Families "Trauma" website (n.d), Barocas and Barocas (1979) and Nagata et al. (1999) were some of the first studies to demonstrate the intergenerational effects of trauma. Their studies looked at children of both Holocaust survivors and interned Japanese Americans. Following these studies, subsequent investigations of intergenerational trauma have discovered various types of transmission among a plethora of populations.

Current literature paints a bleak and shocking reality to the sheer prevalence of intergenerational trauma. Not only is it pervasive, but it also holds no bias and has occurred in vastly different populations. Intergenerational trauma has been discovered in Latinx communities (Cerdeña, 2021), Aboriginal peoples (Menzies, 2019), Native Americans (Pember, 2016), Veterans (Dekel & Goldblatt, 2008), and Holocaust survivors (Bowers & Yehuda, 2016). Slavery in America provides another example of intergenerational trauma as the effects of such practices still infect generations to this day (Graff, 2014). Most recently, the Black Lives Matter movement drew attention to the continued perpetuation of trauma spanning from slavery through Jim Crowe laws and on to current eras of racism. These extended events have resulted in the inheritance of immense trauma (Barlow, 2018). Finally, Brown (2014) even demonstrated that single traumatic events such as 9/11 can have generational consequences. These diverse studies all reveal a clear and cohesive picture of intergenerational trauma.

Trauma does not transmit via one specific pathway or simply manifest as a child experiencing the specific PTSD symptoms their mother did. Because of the infancy and enormity of such a diverse field, trauma has been seen to transmit in multiple ways and have differing effects on offspring. Along with this, the understanding of their transmission is constantly evolving. In todays literature, trauma has been found to pass to subsequent generations through three major modalities: parenting style, epigenetics, and cognition.

Trauma transmitted parenterally comes from the traumatic events experienced by the adult affecting their ability and style of parenting. These effects can result in difficulties with parenting which have negative impacts on children. Parenting has been clearly demonstrated to have a significant impact on a child's development and outcomes (Kuppens & Ceulemans, 2019). Furthermore, Kitamura (2009) and Madden (2015) both found supporting results that parental

styles are transmitted intergenerationally. In many cases, these styles may be beneficial, but in the event that the styles are negative and cause trauma, they perpetuate a continued cycle of trauma generationally. For example, in Schwerdtfeger's (2013) study of 103 mothers, it was found that mothers who had experienced trauma were significantly more likely to have authoritarian parenting styles. These parenting styles included verbal aggression, which was predictive of disorders in their children. These findings exhibit a channel by which the trauma experienced by a parent is passed down intergenerationally. The parents' parenting style paired with the childs' trauma will then be mirrored in the child's own parenting style, thus continuing the intergenerational cycle of trauma (Lomanowska, 2017). Graff (2014) also discusses the parental impact slavery had on black families, as many suffered from insecure styles. These styles were caused by the dominating human relationship template of master and slave. This template resulted in a significant lack of empathy within parenting. On top of parenting styles, a much more silent but consequential modality can transmit trauma in an uncontrollable and detrimental way.

Intergenerational epigenetics is the transmitted changes in genes from one generation to the next. For example, smoking during pregnancy has been linked to gene changes that cause the intergenerational inheritance of allergic diseases (Knudsen, 2018). In the case of trauma, traumatic experiences can cause epigenetic changes which are then passed down to future generations. Though the concept of international trauma transmitted epigenetically is relatively recent, current literature is strong. Bierer (2014) discovered that offspring of Holocaust survivors had higher 11β-HSD-2 levels than their parents. 11β-HSD-2 is an enzyme that catalyzes the production of cortisol, the hormone associated with stress. Following these findings, Yehuda (2016) found that Holocaust survivors had higher methylation of the FKBP5 gene (regulation of

stress hormones) than controls, and their offspring had lower methylation than the controls. This means that Holocaust survivors would more easily produce stress hormones than the general population, but that their children would require more stressors to produce stress hormones than the general population. The link between these two shows that offspring of Holocaust survivors would require more stressors to cause the production of cortisol, but that when they experience enough, they have more enzymes to accelerate its production. Since these studies, multiple other works have sought to further investigate intergenerational epigenetics (Liester & Sullivan, 2019) though the majority agrees on the intergenerational transmission of trauma epigenetically.

Lastly, the cognitive transmission of trauma remains one of the most complex and unknown modalities of the intergenerational transference of trauma. Cognition is defined as "The mental action or process of acquiring knowledge and understanding through thought, experience, and the senses" by Oxford dictionary (Simpson, 1989). More specifically, cognition includes memory, learning, attention, executive functioning, intelligence, language, perception, and decision making. The role of cognition cannot be understated as it is an integral part of development and of the aforementioned areas it includes. For example, a child's working memory is crucial for education (Gathercole, 2005) and negative changes to childhood cognition can cause riskier decision making in adulthood (Birn, 2017). Added to the complexity of cognition is it's slanicany making negative cognitive effects difficult to identify as their consequences may not truly manifest until later in life. This means the intergenerational negative impacts on cognition can be detrimental and often undetected.

The intergenerational transmission of trauma occurs when offspring of a parent who has experienced trauma have a resulting cognitive change. Intergenerational cognitive changes include impaired working memory, decreased cognitive functioning, numerous psychological

risks, and many others. There is clear evidence for the cognitive results of intergenerational trauma, as detailed in many studies. There are also extensive reviews of the literature surrounding epigenetics (Daskalakis, 2021; Youssef, 2018, Bowers & Yehuda, 2016) and parenting (Dreyer, 2018) for intergenerational transmission of trauma. Despite these findings, a literature review of intergenerational trauma through cognition does not exist.

To fill this gap in the literature and investigate the current literature surrounding intergenerational trauma and cognition, I sought to create a literature review examining intergenerational trauma through cognition. Through this review, I worked to answer the question, "What are the cognitive consequences of intergenerational trauma?" To understand this, I examined two databases and over 600 articles. I was able to find six studies whose findings demonstrated the intergenerational transmission of trauma through cognition. Detailed in this review are my methodology, results, detailed review of each included study, and a discussion of the literature and limitations.

Methods

Databases

PsycInfo is the American Psychological Association (APA) scholar database with over 4,990,000 records from all areas of psychology going back as far as 1887. Oregon State University provides free access to this database for all students. Within the advanced search, one can search key terms in specific fields, with date parameters, and filters.

Oregon State University's (OSU) Library database allows students to search within the 400 plus databases accessible to OSU students. Advanced searches allow one to filter by availability, resource type, topic, creator, date, collection, language, journal title, and even search external databases like Google Scholar. The database also provides students with easy access to a

significant amount of full-text options through journals which would otherwise be costly to obtain.

Instruments

To export sources and their bibliographies easily, I used Zotero bibliography software. This program allowed me to mass export thousands of sources at once into a single file. In Zotero, each source was compiled with all of its bibliography information, DOI, and abstract if available.

Covidence is a new literature review software that allows its users to conduct a literature review in an organized and streamlined fashion. Sources can be uploaded from a bibliography software, duplicates are removed, and the remaining sources are then organized in a review. The review is broken up into three steps: title and abstract screening, full-text review, and extraction. Covidence also automatically creates a PRISMA for the user to demonstrate their review visually.

Process

The literature review was completed by examining the PsycInfo and Oregon State University Library databases. In the case of PsycInfo, 2,830 articles were exported from the search “Trauma” and “Cognition” into Zotero and then into Covidence. These articles are to be screened by the ACEND trauma lab for a greater literature review into trauma and cognition. The inclusion criteria for the greater review are “psychological trauma, memory, learning, attention, executive function, intelligence, language, perception (other than PTSD re-experiencing/hallucination), and judgement & decision-making.” While the exclusion criteria are “no psychological trauma measured, no cognitive variables measured, and PTSD/psychopathology symptoms/disorders only.” Within the 2,830 articles, a second search

was conducted with the keywords “intergenerational trauma.” From this secondary search, 11 articles were identified and screened for eligibility with the additional inclusion criteria of “intergenerational trauma” and the new exclusion criteria of “no intergenerational transmission or factors,” see figure 1. Five studies were selected for full-text review, while only three were found eligible for inclusion.

Figure 1

Criteria

Inclusion Criteria	**Exclusion Criteria**
Intergenerational trauma	No intergenerational transmission or factors
Psychological trauma	No psychological trauma measured
Memory (short, long term, applied)	No cognitive variables measured
Learning	PTSD/psychopathology symptoms/disorders only
Attention	
Executive functioning	
Intelligence	
Language	
Perception (other than PTSD re-experiencing/hallucination)	
Judgement & decision-making	

Due to the limited number of findings from the first review, a secondary search was deemed necessary. Originally Google Scholar was used, but it had numerous limiting factors which made it impossible to complete. As a result, an alternative database was found in the OSU Library database. The search criteria used in the OSU database were “intergenerational trauma”

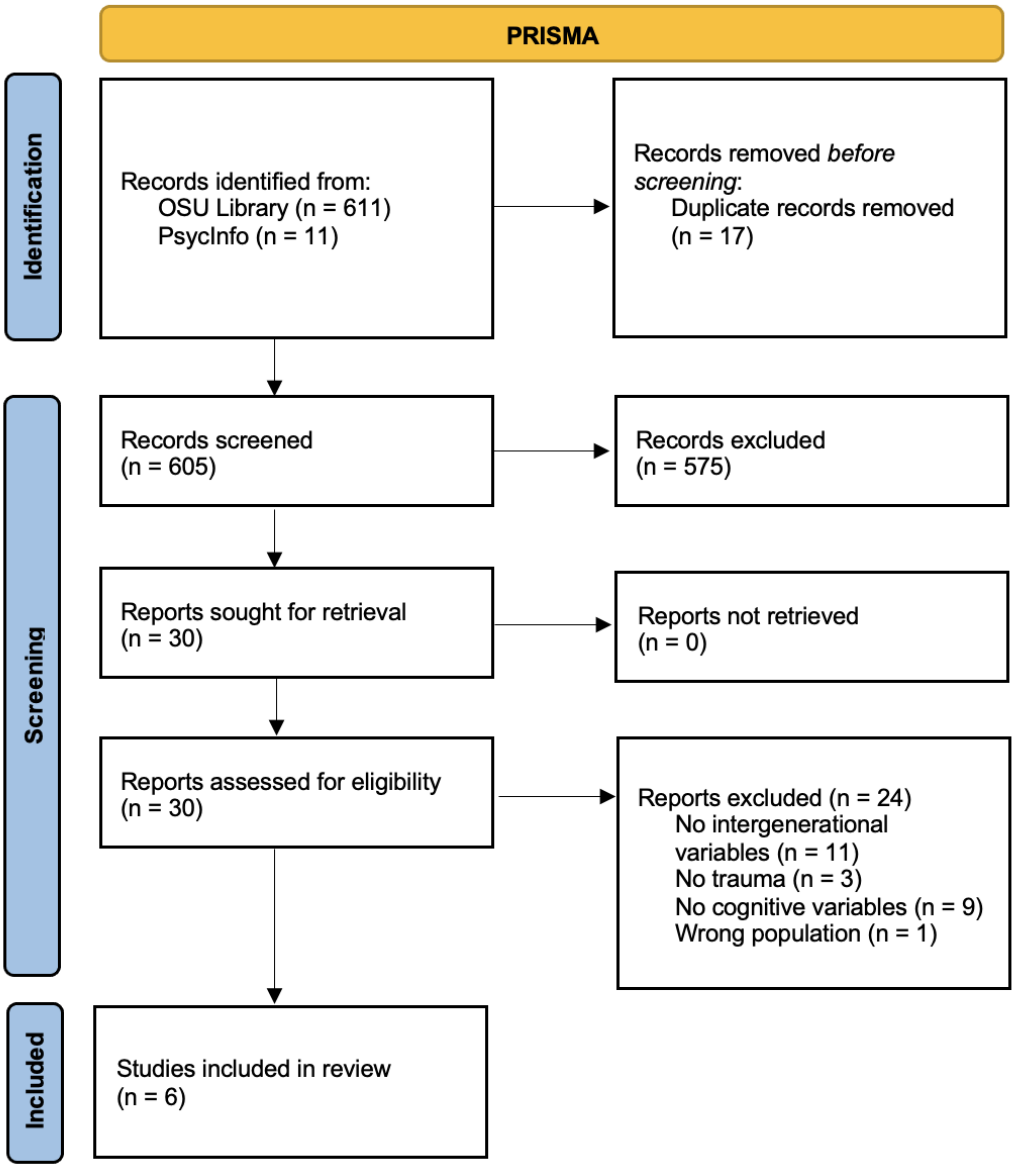
and “cognition” with the filters “2017-2021”, “peer-reviewed journals," and “full text available online.” This provided 611 results which were then exported into Zotero and finally into Covidence for screening after 17 duplicates were removed. The remaining 594 results were then screened by myself and with the help of lab members Johanna DeMeyer and Josalyn Strickler. Through these efforts, 19 studies were identified for full-text review, which I personally reviewed in their entirety. Once reviewed, the three articles from the PsycInfo project were added to Covidence, concluding the review with six included articles.

Results

By employing a literature review, 622 studies were screened, 30 full texts reviewed, 24 were excluded while six were added in the final review, see figure 2. The contents, design, and findings of the six included articles exhibited a complex consensus on the cognitive effects of intergenerational trauma. Many studies illustrated clear cognitive effects while others were more questionable, and some found no effects at all. Given the widely varying results of each article, all must be discussed individually before arriving at a cohesive conclusion.

Figure 2

PRISMA



Included Articles

Bosquet Enlow et al. (2019) discovered groundbreaking results in their study of 276 mothers and their children. Mothers and their children were assessed at three separate times, during pregnancy, at ages two and three and a half. They found that poorer child working memory and inhibitory control were significantly associated with a mother's lifetime

stress/trauma exposure but not with trauma during a child's lifetime. Because only a mother's trauma exposure during her lifetime was associated with the negative cognitive effects, it demonstrates a clear example of intergenerational trauma. They also concluded that caregiving/parenting behaviors had mediating effects on a child's temperament, thus further suggesting parental transmission of intergenerational trauma. Bosquet Enlow et al. provides a critical and significant study. Their longitudinal design, robust sample size, recency, and thorough examination of their participants mean their results have notable reliability.

Rather uncommonly, Holigrocki & Hudson-Crain (2004) investigated intergenerational trauma through a case study design. To complete their study, Holigrocki & Hudson-Crain recruited a 27-year-old mother and her nine-year-old son. The mother was a victim of spousal abuse and, as a result, had been diagnosed with generalized anxiety disorder and had a history of panic attacks. Her son had no noted history of abuse or trauma but was functioning on a first-grade academic level despite being in third grade and had a formal diagnosis of ADHD. Through the case study, the son's intellectual functioning was found to be "Well Below Average to Lower Extreme range," and his social cognition was assessed to be "proudly malevolent." A further examination into this parent-child relationship found that their dynamic was characterized by cognitive-affective themes of strength and weakness where there was a fight for strength by weakening the other. This relationship was also plagued by the mother's "misattunement" and abusive parenting style. Holigrocki & Hudson-Crain concluded that the mother was at risk for causing trauma to her child similar to her own. This study provides significant intergenerational findings both concerning parenting style and cognition.

Zerach & Kanat-Maymon (2017) looked into the intergenerational effects of trauma within 134 Israeli veteran fathers of the Arab-Israeli war in 1973 and their offspring through a

longitudinal design. Of the participants, 80 were ex-prisoners of war (POW), and 44 were not. Fathers were assessed in 2003, and Zerach & Kanat-Maymon found that ex POWs' post-traumatic stress symptoms (PTSS) were correlated to their offspring's' PTSS and negative dyadic adjustment. The fathers' PTSD was found to be a mediator between POW status and the offspring's' PTSS and dyadic adjustment. The longitudinal design and extended period of time between the experienced trauma and the offspring being studied shows clear evidence of intergenerational trauma. The dyadic adjustment and PTSD add a definitive cognitive component.

In Fenerci & DePrince (2018), 113 mothers and their children were assessed for the intergenerational effects of trauma-related cognitions. Of the participants, 54% of children had internalizing symptoms, while 82% had externalizing symptoms, and 54% of participants had dysfunction in their mother-child relationship. Along with this, mothers' traumatic symptoms (e.g., disorganized memory and post-trauma appraisal) were significantly correlated to children's internalizing symptoms and predictive of higher levels of adverse mother-child relationships. These results provide evidence of parental trauma resulting in intergenerational cognitive effects as trauma-related disorganized memory was associated with a child's internalizing symptoms. Despite these results, there was a significant limitation as mothers were not asked to report maltreatment or trauma in the child's life, which could have accounted for the internalizing/externalizing symptoms and the adverse mother-child relationship. Nonetheless, Fenerci & DePrince's study does give supportive findings of cognitive-related intergenerational transmission of trauma.

Scharf (2007) looked into the psychological functioning of second and third-generation Holocaust survivors. The study examined the attachment style, self-perception, distress, and

functioning of 88 Israeli families with parents who were survivors of the Holocaust. Despite the established risks of second-generation Holocaust survivors, the intergenerational effects were only moderate. Within the third-generation, offspring had low psychological function, low self-perception, and their peers noted them to have lower emotional, instrumental, and social functioning. These participants also perceived their parents as less supportive and more controlling than their peers' parents. It should also be noted that these results were the lowest among offspring of parents who were both Holocaust survivors. Scharf concluded that these results suggest intergenerational effects of trauma but did point out that only males were used. She also explained that further investigation is needed to look at other variables which could have contributed to the results. Scharf's results are important given the second and third-generation examination, but the lack of significant cognitive measures and potential confounding variables weaken the findings.

Finally, Jelinek et al. (2013) set out to examine the cognitive functioning of displaced German children during WWII with PTSD, as well as look at the intergenerational effects on their offspring. To do so, they recruited 20 displaced participants with PTSD, 24 without PTSD, and 11 participants who were not displaced, as well as one offspring from each. They hypothesized that a diagnosis of PTSD would be associated with deficits in learning and memory and be correlated to neuropsychological dysfunctions in their offspring. Contrary to their hypothesis, Jelinek and colleagues found no mnemonic dysfunction in participants with PTSD as compared to those without and the nondisplaced participants. Furthermore, there were no cognitive abnormalities within any of the participants' offspring. Jelinek and colleagues concluded that their sample size was a significant limitation, and that age may have nullified any differences given the natural progression of cognitive decline. In relation to intergenerational

trauma, Jelinek et al. deduced that the lack of cognitive dysfunction in the offspring points to resilience within offspring of this population.

Discussion

This literature review into the cognitive effects of intergenerational trauma reviewed over 600 articles and discussed the findings of the six most related articles. Each article varied greatly in its findings and design, but many showed significant cognitive effects of intergenerational trauma (Bosquet Enlow et al., 2019; Holigrocki & Hudson-Crain, 2004; Zerach & Kanat-Maymon, 2017, Fenerci & DePrince, 2018). Based on the supportive findings of Bosquet Enlow et al. and Holigrocki & Hudson-Crain, there are clear cognitive impacts from intergenerational trauma, mainly working memory, inhibitory control, learning, and intelligence. Although three of the six articles demonstrated some kind of cognitive effects, Bosquet Enlow et al. provided the most substantial evidence for intergenerational trauma. Additionally, Holigrocki & Hudson-Crain's case study gives the most profound analysis into intergenerational trauma and the perpetuating factors. Fenerci & DePrince investigated mothers' cognition but did have a shortage of cognitive measurements in the offspring. Finally, Zerach & Kanat-Maymon lack cognitive variables, but their lengthy longitudinal design exemplifies the lifelong threats of intergenerational trauma. Given these articles, along with the substantial literature relating to intergenerational trauma, I believe there is enough evidence to support the cognitive transmission of intergenerational trauma.

Although there is ample evidence, the findings of Scharf (2007) and Jelinek et al. (2013), along with the limited amount of research into this topic, presents many limitations. Much like how Youssef's (2018) review of intergenerational trauma epigenetics found many limitations, this review concludes with similar findings. Firstly, no two studies used the same measurements

or investigated the same cognitive variables, calling into question any coherence between findings. Secondly, no study had the same population of participants and it is impossible to know what constituted trauma in each study. Finally, there were numerous confounding variables which could have accounted for the negative cognitive findings which were not dispelled, e.g., parenting style and the child's own experienced trauma. Despite all of these limitations, the preliminary findings of these studies are still very significant and do point to the cognitive intergenerational transmission of trauma.

Within this review, there were select limiting factors. The number of articles reviewed was lessened due to time constraints and databases. If more databases were reviewed and more time was available, a greater search could have been completed which may have revealed more supporting articles. However, given the infancy of the study of intergenerational trauma and the recency of the supporting articles (Bosquet Enlow et al., 2019; Fenerci & DePrince, 2018; Zerach & Kanat-Maymon, 2017), I do not expect many more articles would have been included. Another limiting factor arose in Google Scholar. Initially, Google Scholar provided the most promising result, an advanced search yielded over 4,800 results, but the program makes it impossible to mass export results to a bibliography software. These limitations in no way limited the findings of the results nor the review process itself.

Future reviews should widen their search and extend the dates of articles they review. Researchers should establish set cognitive variables to investigate and adopt similar measurements to explore intergenerational trauma in studies to come. Most importantly, studies need to screen for trauma within a child's own life as this could be a clear extraneous variable. Going forward, studies should also offer participants information on intergenerational trauma and resources/therapy, which can help to reduce its effects much like Holigrocki & Hudson-

Crain (2004) did. Finally, more studies are needed to better understand the true cognitive effects of intergenerational trauma. The literature shows clear impacts, but the extent and long-term effects of these changes are still unknown.

This literature review showed the progress in the burgeoning field of intergenerational trauma, but also the inherent problems within the research. Much like the beginning of research into intergenerational trauma related to epigenetics, cognition is a significant and rapidly expanding field of research and one with profound findings. As this research evolves, so should the support for those most at risk for the intergenerational transmission of trauma. While the cycle of trauma can feel unavoidable, treatment such as the "Intergenerational Trauma Treatment Model" has shown that progress is attainable (Scott & Copping, 2008). When dealing with those who suffer from the effects of trauma, further research into intergenerational trauma provides a window into stopping the cycle of transmitted suffering.

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Figure 1

Criteria

Inclusion Criteria	Intelligence
Intergenerational trauma	**Exclusion Criteria**
Psychological trauma	No intergenerational transmission or factors
Memory (short, long term, applied)	No psychological trauma measured
Learning	No cognitive variables measured
Attention	PTSD/psychopathology symptoms/disorders only
Executive functioning	
Language	
Perception (other than PTSD re-experiencing/hallucination)	
Judgement & decision-making	

Figure 2

PRISMA