Working memory, episodic memory and sustained attention in women survivors of intimate partner violence in Spain: The Believe Battery

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Abstract

A growing body of literature suggests that intimate partner violence (IPV) is linked to psychopathology and lower cognitive functionality. Nonetheless, few studies have examined neuropsychological correlates using objective neuropsychological assessments. The main objective of this study was to assess the relationship between cognitive functioning (specifically memory and attention) and IPV. A group of women IPV survivors (n = 37) and a group of women who had not experienced IPV (n = 23) were assessed using the Believe Battery, a comprehensive neuropsychological battery adapted for women survivors of IPV. Findings demonstrated that women who have suffered IPV present lower neuropsychological scores in the domains of working memory, verbal episodic memory, and attention compared to women who have not experienced IPV. These results suggest that IPV may have an impact on neuropsychological functioning among women victims and survivors, thus raising an important question about implications in clinical and forensic settings. Future studies should examine whether there are additional differences in other cognitive domains and assess how such differences are related to the potential causal mechanisms of violence (e.g., strangulation, head injury, chronic stress).

Key words: Neuropsychological functioning, Intimate partner violence, Women survivors.

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الذاكرة العاملة والذاكرة العرضية والانتباه المستمر لدى النساء الناجيات من عنف الشريك الحميم في اسبانيا: "The Believe Battery"

الملخص

تُشير مجموعة متزايدة من الأدبيات الى ارتباط عنف الشريك الحميم بالاضطرابات النفسية وبتدني الوظائف المعرفية. وبالرغم من ذلك، فقد أجريت دراسات قليلة حول العلاقة بين عنف الشريك الحميم والأداء النفسي العصبي باستخدام تقييمات نيروسيكولوجية (عصبية نفسية) موضوعية. هدفت الدراسة الحالية الى دراسة العلاقة بين الأداء الإدراكي (الذاكرة والانتباه تحديداً) وعنف الشريك الحميم، حيث تم تقييم مجموعة من الناجيات من عنف الشريك الحميم ومجموعة من النساء اللواتي لم يتعرضن لهذا النوع من العنف باستخدام بطارية اختبارات "Believe Battery" . تتضمن هذه البطارية مجموعة شاملة من الاختبارات النيروسيكولوجية التي تم تطويرها وتقنينها لهذا الهدف. أظهرت النتائج أن النساء اللواتي تعرضن لعنف الشريك الحميم حصلن في اختبارات الذاكرة العاملة والذاكرة العرضية اللفظية والانتباه على درجات أدنى مقارنة بالنساء اللاتي لم يتعرضن للعنف. تُشير هذه النتائج إلى أن عنف الشريك الحميم قد يكون له تأثير على الوظائف الإدراكية لدى النساء اللاتي تعرضن إلى عنف الشريك أو نجون منه، مما يثير تساؤلاً مهمًا حول التطبيقات العملية لهذه النتائج في المجال العيادي والقضائي. لذا نوصي بأن تبحث الدراسات المستقبلية عن أية فروق اضافية في المجالات الإدراكية الأخرى وكيف يمكن تفسير هذه الفروق في ضوء مسببات العنف وأشكاله المختلفة (الخنق، إصابة الرأس، التوتر المزمن).

الكلمات المفتاحية: الوظائف النفسية العصبية، عنف الشريك الحميم، الناجيات من عنف الشريك الحميم

Introduction

Intimate partner violence (IPV) constitutes an urgent and severe public health concern for society (Breiding et al., 2015; World Health Organization, 2021), being one of the most common forms of discrimination and violence against women. On a global scale, a third of women have experienced physical or sexual violence from their partners at least once in their lives (World Health Organization, 2021). While there is no official data regarding the global prevalence of psychological IPV against female partners, research suggests that psychological abuse commonly coexists with other forms of violence (Coker et al., 2000) and estimates that between 23 and 30% of women have experienced non-physical violence from their partners (e.g. controlling behavior and threats) (Thompson et al., 2006).

IPV can lead to important health consequences, as has been demonstrated by a number of studies on both physical (Black, 2011; Coker et al., 2000; Harper, 2019; Wu et al., 2010) and psychological sequelae (Delara, 2016). Few studies, however, have centered on the relationship between neuropsychological functioning and IPV. This is surprising, given that many women experience injuries to the head, face, and neck (Valera & Berenbaum, 2003; Valera & Kucyi, 2017), and report strangulation attempts (Valera et al., 2019), post-traumatic stress (Aupperle et al., 2016; Twamley et al., 2009), and chronic stress (Kwako et al., 2011; Pico-Alfonso et al., 2004, 2006). Along these lines, some studies have researched the complex relationship between the number of traumatic brain injuries (TBIs), recency of TBIs, severity of partner violence, cognitive functioning and mental health among women who have experienced physical violence (Daugherty et al., 2021; Molinares et al., 2022; Valera & Berenbaum, 2003; Valera & Kucyi, 2017). Research has shown that experiencing IPV is related to lower functioning in the domains of processing speed, speeded fluency (Twamley et al., 2009), memory (Daugherty et al., 2019; Valera & Berenbaum, 2003; Valera & Kucyi, 2016), complex visuomotor processing speed, set shifting (Seedat et al., 2005), and executive function (Aupperle et al., 2012; Daugherty et al., 2019; Seedat et al., 2005; Twamley et al., 2009).

One pilot study (Daugherty et al., 2019) in particular calculated the percentage of women who met DSM-5 criteria for mild or severe neurocognitive impairment in terms of the number of standard deviations from normative scores. These findings demonstrated that approximately 60% of the sample presented with mild cognitive impairment in at least

one domain, regardless of the type of violence (i.e. exclusively psychological versus psychological and physical). Further, the majority of cognitive alterations were found in the areas of executive functions and memory. Such neuropsychological alterations, especially those found in attention and memory, may have a significant impact on daily living and rehabilitation of psychological sequelae commonly found among women victims of IPV. Along these lines, research demonstrates that intact attention is necessary for reaching goals in psychotherapy (Douglas et al., 2020; Rakofsky et al., 2011). Thus, it is possible that diminished performance in attention and memory may have a negative impact on the therapy women receive for issues such as post-traumatic stress or depression. Further, executive functioning, (e.g. attention, planning) has important implications for quality of living, being associated with difficulties in obtaining resources in the context of IPV (Lee & DePrince, 2017).

With these practical implications in mind, it is necessary to gain a better understanding of cognitive performance in women survivors of IPV. Nonetheless, cognitive functioning is not routinely evaluated, diagnosed or treated in centers tending to women survivors of IPV. There are many reasons why women are not being evaluated and treated for neurocognitive alterations, including underreporting (Murray et al., 2016; Zieman et al., 2017), a lack of awareness among professionals (Haag et al., 2019b), as well as the urgent need for a free and comprehensive evaluation tool adapted to the needs of women IPV survivors (Haag et al., 2019a; Kwako et al., 2011). Regarding the latter, the BELIEVE battery has been developed as a unique and adapted instrument for measuring the neuropsychological consequences of IPV and the potential underlying mechanisms of such alterations (Perez-Garcia et al., 2023). This battery, which will be briefly described in this paper, was created with the intention of propelling research on the neuropsychological impact of IPV as well as improving free access to cognitive testing for women victims and survivors.

Considering the lack of research on the cognitive correlates of IPV and the relevance of memory and attention in the rehabilitation and daily functioning of women victims, this study sought to assess the relationship between IPV and neuropsychological functioning using the free and computerized neuropsychological battery for women victims and survivors: the BELIEVE Battery. Thus, this study is novel in its implementation of a free neuropsychological battery that was specifically developed for IPV survivors. Furthermore, it is novel in its inclusion of a diverse sample of women. To date, the majority of research on neuropsychological performance in IPV survivors has been conducted in North America (Aupperle et al., 2016; Deering et al., 2001; Hebenstreit et al., 2014;

Muir et al., 2022; Raskin et al., 2023; Seedat et al., 2005; Stein et al., 2002; Twamley et al., 2009; Valera & Berenbaum, 2003; Valera & Kucyi, 2017; Valera et al., 2022). To the best of our knowledge, only four studies have examined neuropsychological functioning among IPV survivors outside of this geographical region (Castro et al., 2022; Chung et al., 2014; Daugherty et al., 2019; Rodriguez & Guzmán Cortés, 2023), thus limiting the representativeness of our understanding of the potential impact of IPV on cognition in diverse samples. As such, the present study provides preliminary findings using a new cognitive assessment tool as well as a diverse sample of IPV survivors.

One barrier to examining the impact of IPV on cognitive functioning is that studies are retrospective. Given ethical considerations, research studies evaluate IPV survivors after the abuse has already occurred. This methodological limitation, however, can be approached in several ways: either through correlational analyses between IPV factors and neuropsychological performance (while controlling for other variables that could impact cognitive functioning, such as neurocognitive disease), or through comparing the performance of IPV survivors with a 'control group' of non-IPV survivors who are similar in age, socioeconomic status and education. The first of these options has an inherent limitation, in that we do not know the pre-morbid level of cognitive functioning before experiencing IPV. While still an approximation, including a comparison group of women who have not experienced IPV, yet who are similar in several critical variables, allows us to estimate how their neuropsychological performance might be in the absence of IPV. For these reasons, this study has implemented a group-based comparison between IPV survivors and women who have not experienced IPV.

The objective of this study is to assess the relationship between IPV and memory and attention through the comparison of a group of IPV- survivors and a matched group of women who did not report lifetime IPV. Given previous findings of a relationship between IPV and cognitive performance (Daugherty et al., 2019; Stein et al., 2002), we predict that there will be differences between individuals who have experienced IPV and those who have not in the domains of attention, working memory, learning ability, and short-term and long-term verbal memory. By investigating these cognitive domains, we hope to gain insights into the potential cognitive effects of IPV exposure.

Methods and Materials

Participants

An a-priori power analysis was conducted using the *power package* (Champely et al., 2018) for R 4.0.5 (R Core Team, 2021) to calculate the sample size needed to conduct independent samples *t*-test analyses. Based on Daugherty et al. (2019) who conducted similar group comparisons in neurocognitive performance, an effect size of 1.02, a statistical power of .80, and an alpha level of .05 were established. A minimal sample size of $n = 16$ per group was obtained.

Sixty women participated in this study. The sample comprised two groups: women survivors of IPV ($n = 37$) with an age range between 21 and 60 ($M = 36.19$, $SD = 9.03$), and a group of women who had not experienced IPV ($n = 23$) with an age range between 18 and 60 ($M = 31.43$, $SD = 11.84$). There were no significant differences between groups in terms of age and socioeconomic status (see Table 1). On the other hand, significant yet small between-group differences were found in education (see effect sizes in Table 1).

Inclusion criteria for participation were: at least 18 years of age and fluency in Spanish. Considering the high prevalence of IPV in the general population (World Health Organization, 2021) and underreporting (Murray et al., 2016; Zieman et al., 2017), women who identified as non-victims also completed the Composite Abuse Scale Revised-Short Form SF (CASR-SF; Ford-Gilboe et al., 2016). Participants who reported any type of physical, sexual, or psychological violence were removed from the non-victim group.

Instruments

Severity of IPV

Composite Abuse Scale—Short Form (CAS-SF; Ford-Gilboe, 2016) was used to assess the frequency of physical, psychological and/or sexual violence by one's partner. This is a 15-item self-report measure that assesses the severity and intensity of IPV in the past 12 months. CASR-SF assesses the severity of each type of violence on a Likert scale of 0-5 where 0 = Not in the past 12 months/Never, 1 = Once, 2 = A few times, 3 = Monthly, 4 = Weekly, 5 = Daily/ Almost Daily, with a range of 0-75. CASR-SF has an internal consistency of $\alpha = .94$ (Ford-Gilboe et al., 2016). The original CASR-SF (Ford-Gilboe et al., 2016) measures violence in the past year and the version used in this study was amplified to include IPV throughout the entire lifespan. International Test Commission Guidelines for Translating and Adapting Tests (Second Edition) protocol (International Test Commission, 2018) was followed to develop a Spanish version of this measure.

The present study employed the Believe Battery (http://projectbelieve.info), a free, online and comprehensive neuropsychological battery specifically developed for

women victims and survivors of IPV. The Believe Battery includes evidence-based measures for neuropsychological functioning, which were based on the EMBRACED Project (Ibanez-Casas et al., 2023). Specifically, the cognitive domains assessed by this battery include memory, executive function, attention, language, motor and visuospatial abilities, perception, orientation, and social cognition. Further, the Believe Battery includes measures for mental health including depression, post-traumatic stress, Complex PTSD, and generalized anxiety. The Believe Battery also includes measures for perceived stress, general health (screening for physical illnesses and disorders from health measures), adverse childhood experiences, and possible traumatic brain injury. Finally, Believe includes a performance validity test to allow for the use of neuropsychological evaluations in forensic contexts. In the next section, we will describe the specific measures that were selected from this battery to achieve the objectives of this study.

Cognitive testing

For the present study, we have administered the following subtests from the Believe Battery:

Digit Span. This computerized test, adapted from the original version of the Digit Span from the WAIS (Blackburn & Benton, 1957), assesses working memory. Participants are provided with two tasks in which they must follow and process a series of numbers. In the first task (digits span forward; DSF), participants listen to a series of digits and then repeat them in the same order. In the second task (digits span backwards; DSB), participants listen to a series of digits and are asked to say them in reverse order. In the Digit Span, there are a total of 7 different series that have an increasing span beginning at two digits and proceeding until eight digits. There are one second intervals between each digit, and two trials for each digit series (a total of 14 trials). Unlike the original version of the WAIS-IV, in which participants are stopped once two consecutive failures occur or until an eight-digit series is repeated, participants continue until the end of the assessment, which reaches a maximum series of eight digits. Scores include the longest series reached, as well as the total number of correct series recalled.

Word List. This computerized test, adapted from the original California Verbal Learning Test (Elwood, 1995), is used to assess learning ability, and short-term and long-term verbal memory. Participants first hear a list (List A) of 16 words five times and are asked to repeat as many words as they can remember each time (learning). There are four semantic categories in this list, which include the names of flowers, vegetables, musical instruments, and insects. Next, an interference list (List B) made up of different words is presented (including flowers, professions, animals, and vegetables). After listening to List B, participants must recount as many words as possible from this same list. Following the interference paradigm, participants are asked to recall as many words as possible from List A (short-term memory). Finally, after a 20-minute pause, participants are asked to repeat as many words as they can remember from List A. Scores include the sum of each of the first five series (learning index), List B, short-term recall and long-term recall. Further, omission (when the participant should respond but does not)

and commission (when the participant does not have to respond but responds) scores may also be obtained.

Continuous Performance Test. This computerized test was adapted from the original version of the measure (Conners et al., 2000) for measuring attention. In this task, participants see a series of letters on the screen, one at a time. They are asked to tap the screen only when the letter "A" appears right after the letter "X". Otherwise, they are asked to do nothing. This test is made up of three blocks containing 100 stimuli in each. Stimuli are presented in 500 millisecond intervals, and the percentage of target stimuli (when the participant has to respond) is set at 20%. Scores include the number of hits for each block, the number of commission errors and omission errors, and the mean and median reaction time in milliseconds.

Cancellation Test. This computerized test measures attention. Participants are asked to identify specific numbers hidden in a block of characters, working from left to right. Participants must click when they see the digits 5 or 9, after which the digits become visibly marked to indicate they have been touched. Participants are warned that they cannot work backwards (from right to left), and that they must continue moving forwards at all times, even if they realize later that they have missed something. Fifteen seconds are allotted for each block, which is made up of 3 lines of characters, and 20 characters per line. Participants are given 3 second countdowns before each block of characters appears. Scores include the number of hits and number of errors (commission and omission).

Procedure

Statistical Analysis

First, due to the large number of variables by group, we visually assessed data normality, noting some slight deviations from normality. With adequate sample size and statistical power, non-parametric tests were performed, producing results consistent with *t*-tests. Consequently, the *t*-test was selected as the most suitable and robust method of analysis.

Independent samples *t*-tests were conducted for each variable to study group mean differences between the IPV and non-IPV groups. In addition, Cohen's *d* effect sizes were calculated for each of these differences, with values of .20, .50, and .80 indicating small, medium, and large effect sizes, respectively (Cohen, 1992).

Statistical analyses were performed using R 4.0.5 software (R Core Team, 2021).

Results

Statistically significant differences in working memory were found between the two groups for the total score of the DSF subtask, t (58) = 2.707, p = .009, d = .73, and for the longest correct series in the DSF subtask, t (58) = 3.001, p = .004, d = .78, with medium-to-large effect sizes indicating a better performance for the non-victims. On the other hand, no significant differences were found for the DSB subtask (Table 2).

Regarding verbal memory, significant differences were found in the Word List Task in favor of the non-victims group for trials 3, 4, and 5, with large effect sizes of d = 1.15, d = 1.28, and d = 1.04, respectively (see Table 2 and Figure 1). Furthermore, this group also outperformed the survivors group in the interference trial, t (58) = 2.887, p = .005, d = .78, as well as in short- term, t (58) = 2.889, p = .005, d = .81, and long-term recall, t (58) = 4.112, p < .001, d = 1.10. There were no differences for the memory recognition trials.

The CPT failed to find significant differences for Blocks 1 and 2. In CPT Block 3, significant differences were only found for the omission errors, t (58) = -2.758, p = .008, d = -.80, with the survivors group having the highest number of omissions, and thus showing a poorer performance in attention.

Finally, no differences were found in visual perception when the two groups performed the cancellation task, with effect sizes ranging from trivial to small in favor of the non-IPV victims group (Table 2).

Discussion

Using the Believe battery, a free and computerized neuropsychological battery adapted for women victims and survivors of IPV, this study assessed working memory, verbal episodic memory and sustained attention, some of the cognitive domains most commonly associated with intimate partner violence. The principal results of this study showed that women who have suffered IPV present lower neuropsychological scores in the domains of working memory, verbal episodic memory and attention compared to women who have not experienced IPV.

Our finding of a poorer performance in working memory falls in line with previous studies carried out with IPV survivors (Daugherty et al., 2019; Stein et al., 2002; Marin Torices et al., 2016) and children who have grown up in IPV contexts (DePrince et al., 2009). Working memory is needed to access certain services (e.g. employment or legal assistance), as it requires the effective execution of tasks, such as completing applications or technical documents, contacting various offices to receive financial assistance, and being able to cover basic needs related to housing. In fact, poorer performance in working memory has been related to difficulties in planning and requesting economic resources among IPV victims (Lee & DePrince, 2017). Navigating this process may be further complicated by threats, fear, distress, legal problems, custody, ongoing stress or other consequences of IPV (Lee & DePrince, 2017). It is therefore critical to increase

professional support in obtaining resources and receiving cognitive rehabilitation for potential alterations in working memory. This may enable women to cope with complex processes such as legal proceedings and also protect them from future experiences of violence (Bybee & Sullivan, 2005; Lee & DePrince, 2017).

The present study also found differences between women IPV victims and women who had not experienced IPV in episodic verbal short- and long-term memory. Much of the previous research conducted on memory and intimate partner violence has relied on retrospective self-reports of memory impairment or memory loss (Daugherty et al., 2021; Jackson et al., 2002; Kennedy et al., 2007; Smith et al., 2001). The findings presented here, however, indicate a relationship between objective memory performance and IPV victimization, which has been shown in only a handful of other studies (Daugherty et al., 2019; Valera & Berenbaum, 2003; Valera et al., 2022; Valera & Kucyi, 2017). Poorer performance in verbal short-term memory has serious implications for victims, as it impacts mental health and everyday tasks such as remembering a grocery list (Gustafsson et al., 2013; Torres-García et al., 2021).

On the other hand, it is important to note that we found no between-group differences in verbal memory recognition. This finding is similar to that of previous research comparing a control and IPV group, which likewise demonstrated no differences in verbal memory recognition (Daugherty et al., 2019). While more research is needed to confirm this hypothesis, it is possible that IPV (both psychological and physical) primarily impacts recall processes, as opposed to recognition where memory is prompted.

In terms of visual memory, we found no significant between-group differences. Previous findings for visual memory correlates of IPV are inconclusive, as some studies have found no differences between IPV survivors and control participants (Daugherty et al., 2019; Twamley et al., 2009), while others have found higher performance among control participants (Stein et al., 2002). Given discrepancies in group characteristics (e.g. how the 'control' group is defined, the recency and/or severity of violence), more research is needed in order to draw clearer conclusions on how the IPV relates to visual memory.

Finally, between-group differences were found in the domain of attention. In this case, IPV survivors performed with greater omission errors as compared to the non-IPV group. Omission of errors, or not responding to the target letters (Conners et al., 2000), is indicative of attentional problems (Conners et al., 2000). These results reflect previous studies that have likewise found attentional difficulties in IPV victims (Daugherty et al, 2019; Kennedy et al., 2007). And as previously mentioned, research considers that intact attention is necessary for goal attainment in psychotherapy (Douglas et al, 2020; Rakofsky et al, 2011). Therefore, more research and clinical focus on attentional alterations are merited.

These results involve important practical implications for both clinical and forensic practice. On the one hand, poorer planning capacities have been related to difficulties in requesting economic resources in women victims and survivors (Lee & DePrince,

2017). Along these lines, alterations in cognitive domains (such as executive function), may hinder some women from accessing the social, psychological, financial and legal support they need. On the other hand, long-term memory impairment in areas, such as autobiographical memory, may have severe implications for women involved in legal proceedings if they are not able to remember specific facts about the violence (Asensi, 2016; Billoux et al., 2016). Women who experience these problems are not receiving adequate neuropsychological rehabilitation, and more support in this area is desperately needed due to the global consequences they have on the survivor's life and well-being.

Nonetheless, this study must be interpreted in light of its limitations. First, the domains of attention and memory were evaluated using only one test per domain, and it is preferable to use multiple tests in order to make neuropsychological diagnosis. Despite this limitation, the tests that were used have been widely supported for assessing these cognitive domains. An additional limitation is that we did not apply a comprehensive neuropsychological assessment to examine whether alterations in memory and attention present alongside other cognitive difficulties. We felt the need to limit the number of tests given the high level of cognitive fatigue among this population. While the sample size was sufficient for analyses, it was relatively small. With a larger sample size, we would have been able to draw more representative and powerful conclusions. More research is needed to replicate our findings in a larger sample in order to test whether the same results are maintained.

The results of this study demonstrate that there are differences in cognitive performance between women who have experienced IPV and a non-IPV group in working memory, episodic verbal memory, and attention. Future studies should examine whether there are additional differences in other cognitive domains, and assess how cognitive functioning is related to the different potential causal mechanisms.

Table 1. *Sociodemographic Characteristics*

	Non-IPV (n = 23)	***IPV (n = 37)***	***t-value/χ^2***	***Effect size (d/φ_c)***
Age (*M, SD*)	31.43 (11.84)	36.19 (9.03)	t(58) = -1.76, p = .08	-.467
SES (*n, %*)				
<5000€	16 (69.56%)	19 (51.36%)		.375
5000-11999€	2 (8.70%)	14 (37.84%)		
12000-15999€	3 (13.04%)	1 (2.70%)	$\chi^2(4) = 8.45$, p = .08	
16000-24999€	2 (8.70%)	2 (5.40%)		
25000-34999€	0 (0.00%)	1 (2.70%)		
Education (*n, %*)				
No University	6 (26.09%)	26 (70.27%)	$\chi^2(1) = 11.12$, p < .001	.431
University	17 (73.91%)	11 (29.73%)		

Note. SES: socioeconomic status operationalized as income in the past 12 months.

Table 2. Mean, standard deviations and *independent Samples t-tests of the neuropsychological measures*

	Non-IPV (n = 23)		***IPV (n = 37)***			
	M	*SD*	*M*	*SD*	*t-value*	*Cohen's d*
DSF - Total	8.78	1.44	7.65	1.65	2.707**	.73
DSF - Series	5.00	.90	4.35	.75	3.001**	.78
DSB - Total	6.48	1.73	5.59	1.96	1.772	.48
DSB - Series	3.65	1.07	3.46	1.14	.650	.17
Word List - 1	7.78	2.02	6.97	2.64	1.258	.34
Word List - 2	11.48	2.71	10.16	3.06	1.690	.46
Word List - 3	13.74	1.86	10.51	3.51	4.058***	1.15
Word List - 4	14.26	1.96	11.24	2.69	4.658***	1.28
Word List - 5	14.52	2.13	11.57	3.41	3.720***	1.04
Word List - B	6.91	1.93	5.22	2.37	2.887**	.78
Word List - ST	13.61	2.15	11.19	3.63	2.889**	.81
Word List - LT	14.18	1.34	10.78	4.16	4.112***	1.10
Word List Hits	12.74	6.03	12.78	5.13	-.031	-.01
Word List Omis.	.78	.79	1.86	3.08	-1.645	-.48
Word List Comis.	1.65	2.59	3.14	5.44	-1.222	-.35
CPT Block 1 - Hits	14.91	3.13	15.22	1.73	-.483	-.12

CPT Block 1 - Omis.	3.78	4.45	2.22	1.84	1.902	.46
CPT Block 1 - Comis.	.91	1.53	1.19	3.00	-.409	-.12
CPT Block 1 - Median	486.04	78.33	506.04	77.59	-.967	-.26
CPT Block 2 - Hits	15.91	2.47	15.14	3.00	1.042	.28
CPT Block 2 - Omis.	.87	2.18	.86	1.49	.010	.01
CPT Block 2 - Comis.	.74	1.57	1.03	3.70	-.353	-.10
CPT Block 2 - Median	481.28	52.26	501.80	62.62	-1.312	-.35
CPT Block 3 - Hits	15.48	1.08	14.41	3.29	1.511	.44
CPT Block 3 - Omis.	.39	.66	1.78	2.36	-2.758**	-.80
CPT Block 3 - Comis.	.09	.29	.97	2.85	-1.480	-.43
CPT Block 3 - Median	475.63	52.98	508.17	68.42	-1.945	-.53
Cancellation - Hits	108.30	11.01	102.65	13.91	1.653	.45
Cancellation - Omis.	11.70	11.01	17.35	13.91	-1.653	-.45
Cancellation - Comis.	.35	.57	.51	1.02	-.713	-.19
Cancellation - Backward	3.43	12.59	4.81	12.56	-.412	-.11

Note. CPT: Continuous Performance Test; DSB: Digit Span Backwards; DSF: Digit Span Forwards; LT: Long-term memory; Omis.: Omission; Comis: Commission; ST: Short-term memory.

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

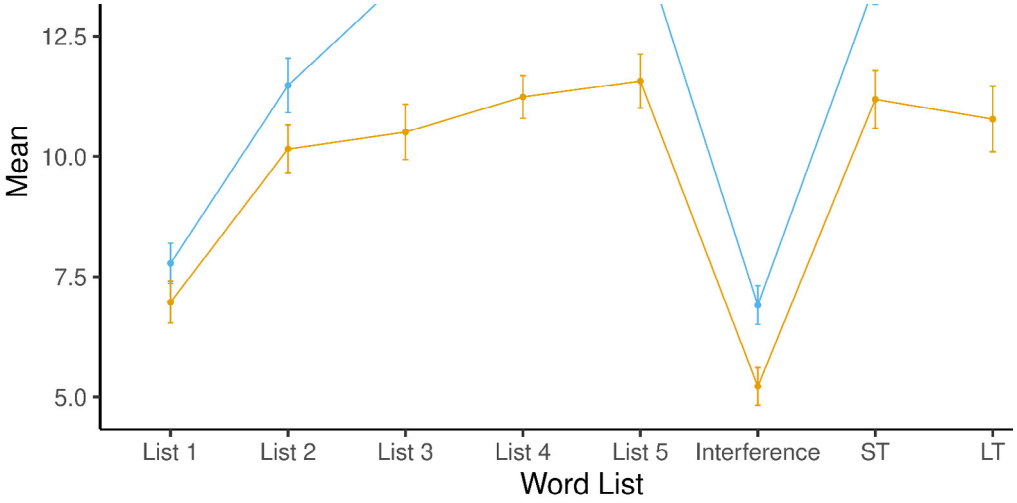

Figure 1. Mean Scores on the Verbal Memory Word List Task for Women IPV Survivors and Non-Victims

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