

PTSD As a Neuropsychological Construct:

From Camp Lejeune to Bethlehem

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Antonio E. Puente, Ph.D.
University of North Carolina Wilmington





Antonio Puente, PhD (left) presents Dr. Gerald Goldstein with the APA Presidential Citation at the annual meeting of the International Neuropsychological Society.



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Roger W. Sperry Neuropsychology Lab



Personal Perspectives: Who Makes it and Who Doesn't?

I. Cuba

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- I. Cuba
- II. Health Care & Health Care Policy

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Personal Perspectives: Who Makes it and Who Doesn't?

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- IV. Camp Lejeune
- V. Bethlehem
- VI. Summary**

Post-Traumatic Stress Disorder (PTSD)

Shell Shock

“Physical forces generated by explosion are sufficient to cause physical shock and emotional shock” (Mott, 1919)

War Neurosis

Continued through WWII in military psychology (Merriman & Winter, 2006)

PTSD DSM-5 Criteria

Criteria A: **Stressor**

Exposure to actual or threatened death, serious injury, or sexual violence

Criteria B: **Intrusion**

Presence of at least one of the following events: Recurrent, involuntary, and intrusive distressing moments of the traumatic event(s); Recurrent distressing dreams in which the content and/or affect of the dream are related to the traumatic event; Dissociative reactions in which the individual feels or acts as if the traumatic event(s) were recurring; Intense or prolonged psychological distress at exposure to cues that resemble an aspect of the traumatic event; Physiological reactions to cues that resemble an aspect of the event(s)

Criteria C: **Avoidance**

One or both of the following: Avoidance of distressing memories, thoughts, or feelings related to the traumatic event(s); Avoidance of external reminders that arouse distressing memories, thoughts, or feelings related to the traumatic event(s)

PTSD DSM-5 Criteria

Criterion D: Altered Cognition and Mood

Presence of two or more of the following: Inability to remember an important aspect of the traumatic event(s); Negative beliefs about or expectations about oneself, others, or the world; **Distorted cognitions** about the cause or consequences of the traumatic event(s); Persistent negative emotional state; Diminished interest in activities; Feelings of detachment from others; Inability to experience positive emotions

Criterion E: Altered Arousal and Reactivity

Presence of two or more of the following: Aggression; Self-destructive behavior; Hyper vigilance; Exaggerated startle response; **Difficulties concentrating**; Difficulties sleeping

PTSD DSM-5 Criteria

Criterion F: Duration

Criteria B, C, D, and E met for more than one month

Criterion G: Impairment

Significant distress or impairment in social, occupational, or other areas of functioning

Criterion H: Comorbidity

Symptoms not attributable to physiological effects or a substance or medical condition

Specify if:

Depersonalization or derealization

Delayed onset

Physiological Changes

Structural changes occur in the limbic system (amygdala, hippocampus, hypothalamus) and the frontal cortex



(Evans, 2015)

Cognitive Consequences

Intellectual ability

Low IQ (Brewin, Andrews & Valentine, 2000)

Memory

Verbal Memory (Brewin, Kleiner, Vasterling & Field, 2007)

Attention and executive functioning

Response inhibition and attention regulation (Aupperle, Melrose, Stein & Paulus, 2011)

PTSD in the Military

PTSD is more chronic

10% of Gulf War veterans and 11% of Vietnam veterans

40 years after deployment (Steenkamp et al., 2015)

PTSD = “**signature injury**” of those returning from current wars(Marx, 2009)

Of >2 million returning from current wars, **20%** have filed a claim for PTSD

PTSD Assessment Measures

Interviews

Clinician Administered PTSD Scale for DSM-V (CAPS-5)

PTSD Symptom Scale-Interview (PSS-I)

Structured Interview for PTSD (SI-PTSD)

Self-Report Measures

Minnesota Multiphasic Personality Inventory II (MMPI-II)

Mississippi Scale for Combat-related PTSD (M-PTSD)

Modified PTSD Symptom Scale (MPSS-SR)

Penn Inventory for PTSD (Penn Inventory)

Posttraumatic Diagnostic Scale (PDS)

PTSD Checklist for DSM-V (PCL-5)

Trauma Symptom Inventory (TSI)

(National Center for PTSD,
2014)

Neuropsychological Consequences of Blast Injuries and PTSD in a Large Military Sample

Antonio E. Puente, Angela Sekely, Cuxian Wang, & Alan Steed
University of North Carolina Wilmington & Camp LeJeune

Archives of Scientific Psychology

Procedure

Referral from Case Manager

Review of Patient History

Clinical Interview

Neuropsychological Test Battery

BAI, CVLT-II, COWAT, Grip strength, Grooved Pegboard, Trails A & B, Hayling and Brixton Test, MMPI-2, Stroop NST, TOMM

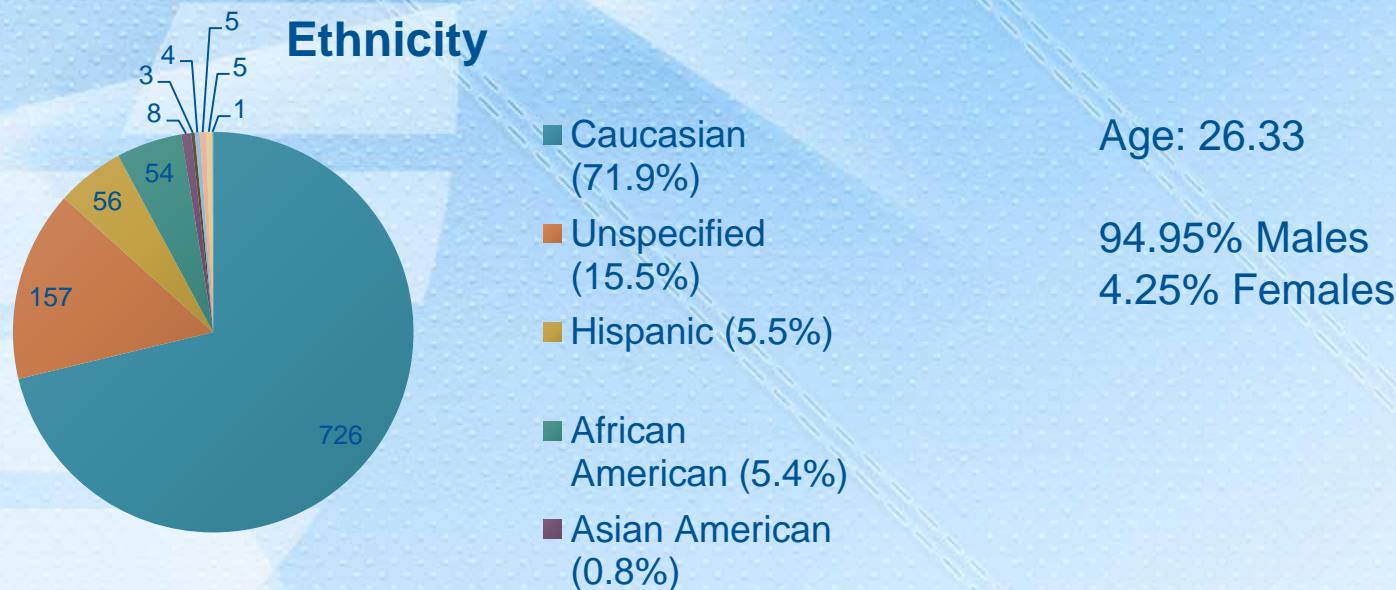
TSI: consisted of WAIS-III/WAIS-IV, WMS-III/WMS IV, WRAT-4, Zung Depression Scale

Follow-up session

Dataset of Military Personnel from Camp Lejeune, NC

Participants

1,010 military personnel serving in the Marine corps and U.S Navy in Camp Lejeune



Demographics of Blasts/PTSD Groups

Demographic	Mean (SD)			
	Blasts	PTSD	Both	None
Age ^a	25.97(5.86)	27.31(7.30)	25.94(5.48)	26.90(8.28)
Education ^a	12.48(1.15)	12.41(1.22)	12.47(0.96)	12.61(1.22)
Number of deployments	2.05(1.24)	1.82(1.47)	2.14(1.25)	1.37(1.22)
Time since injury ^b	26.28(28.25)	25.20(30.09)	29.24(27.18)	21.20(24.24)
<u>ASVAB</u>				
AFQT	64.13(18.44)	58.15(18.52)	58.05(18.41)	62.45(16.35)
GT	109.93(14.05)	109.18(10.70)	109.05(11.38)	111.09(9.32)
MM	111.89(13.28)	109.87(11.54)	109.15(13.11)	110.66(11.11)
CL	101.85(27.74)	97.64(28.73)	96.34(32.98)	105.15(19.50)
EL	109.40(11.12)	108.45(10.24)	106.88(14.39)	108.11(13.44)
Total N	230	126	402	252

^a Years ^b Months

Note. AFQT = Armed Forced Qualification Test; GT= General Technical; MM= Mechanical Maintenance; CL= Clerical; EL= Electronics

Demographic Characteristics of Participants

Demographic	Frequency	Percentage
<u>Ethnicity</u>		
Caucasian	630	63.32
Unspecified	247	75.18
Hispanic	51	5.13
African American	50	5.02
Asian American	8	0.80
American Indian	3	0.30
Pacific Islander	5	0.50
Other	1	0.10
<u>Gender</u>		
Male	847	85.13
Unspecified	107	10.75
Female	41	4.12
<u>Handedness</u>		
Right	741	74.47
Unspecified	153	15.38
Left	85	8.54
Ambidextrous	16	1.61

Service-Related Information

Demographic	Frequency	Percentage
<u>Location of deployment</u>		
Iraq	435	48.71
Afghanistan	149	16.69
Unspecified	141	15.79
Both	131	14.67
Home base	19	2.12
Other	18	2.02
<u>Rank</u>		
E1	1	0.11
E2	29	3.25
E3	208	23.29
E4	234	26.20
E5	173	19.37
E6	59	6.61
E7	27	3.02
E8	16	1.79
E9	10	1.12
O2	2	0.22
O3	5	0.56
O4	1	0.11
W2	4	0.45
W3	1	0.11
W4	3	0.34
Unspecified	120	13.44
<u>Service Branch</u>		
USMC	635	71.11
Unspecified	219	24.52
USN	38	4.26
USMC and USN	1	0.11

Note. E1=Private; E2= Private First Class; E3= Lance Corporal/Seaman Apprentice; E4= Corporal/ Petty Officer Third Class; E5= Sergeant/ Petty Officer Second Class; E6= Staff Sergeant/ Petty Officer First Class; E7= Gunnery Sergeant/ Chief Petty Officer/ Sergeant First Class; E8= Master Sergeant/ First Sergeant; E9= Master Gunnery Sergeant/ Sergeant Major/ Hospital Corpsman Master Chief; O2= First Lieutenant; O3= Lieutenant/ Captain; O4= Major; W2= Chief Warrant Officer 2; W3= Chief Warrant Officer 3; W4= Chief Warrant Officer 4; USMC= United States Marine Corps; USN= United States Navy

Participants Continued...

Blast frequencies

One blast: 124
Multiple blasts: 511
Unspecified: 310

Injury related

Loss of Consciousness: 451
Headaches: 555
Sleep Problems: 571
Substance Abuse: 541

Injury-Related Information

Demographic	Frequency	Percentage
Blast Frequencies		
Multiple blasts	446	49.94
Unspecified	280	31.35
One blast	109	12.21
No blasts	58	6.49
Headaches		
Yes	485	54.31
Unspecified	384	43.00
No	24	2.69
Loss of Consciousness		
Yes	398	44.57
Unspecified	290	32.47
No	172	19.26
Unsure	33	3.70
Referral Reason		
Blasts	594	66.52
Head injury	58	6.49
Fall	43	4.82
Closed head injury	35	3.92
Vehicle accident	33	3.70
Emotional changes	22	2.46
Memory problems	12	1.34
Unspecified	10	1.12
Physical assault	8	0.90
Heat stroke	6	0.67
Concussion	4	0.45
Cognitive changes	3	0.34
Hydrocephalus	3	0.34
Seizures	3	0.34
ADHD	2	0.22
Infection	2	0.22
Multiple sclerosis	1	0.11

Demographic	Frequency	Percentage
Sleep Problems		
Yes	511	57.22
Unspecified	345	38.63
No	37	4.14
Substance Misuse		
Unspecified	481	53.86
Yes	219	24.52
No	193	21.61
Type of Injury		
Unspecified	372	41.66
Multiple blast types	157	17.58
IED mounted	137	15.34
IED not specified	74	8.29
IED dismounted	72	8.06
Rocket propelled grenade	13	1.46
Fall	12	1.34
Vehicle	12	1.34
Concussion	10	1.12
Mortar	9	1.01
IED dismounted & mounted	7	0.78
Gunshot	5	0.56
Grenade	4	0.45
Motor vehicle accident	3	0.34
Motorcycle	3	0.34
Rocket	3	0.34

Preliminary Statistics on Effort Testing

Test	Mean (SD)	Median	Mode	Range
TOMM				
Trial 1 ^a	44.28 (6.53)	47	50	13-50
Trial 2 ^a	47.95 (5.19)	50	50	9-50
Retention trial ^a	47.71 (5.69)	50	50	12-50

^a Total # correct

Effort Testing Data of Blasts/PTSD Groups

Tests	Mean (SD)			
	Blasts	PTSD	Both	None
<u>TOMM</u>				
Trial 1	44.64 (6.38)	44.11(7.10)	43.84 (6.44)	44.87 (6.52)
Trial 2	47.89 (5.36)	48.10 (4.54)	48.10 (4.54)	47.90 (4.54)
Retention Trial	47.49 (6.32)	47.74 (5.26)	47.74 (5.26)	48.01 (5.26)
Total N	230	402	402	252

Preliminary Statistics on Valid Effort Testing Profiles

Test	Mean (SD)	Median	Mode	Range
<u>TOMM</u>				
Trial 1 ^a	46.20 (4.23)	48	50	29-50
Trial 2 ^a	49.64 (1.00)	50	50	45-50
Retention trial ^a	49.63 (1.01)	50	50	45-50

^a Total # correct

Number of Profiles Eliminated by Group

Group	Total Profiles	Total Valid Profiles	Total Invalid Profiles
Blasts only	230	201	29
PTSD only	126	110	16
Both	402	349	53
Neither	252	225	27
Total	1,010	885	125

Effort Testing Data of Valid Profiles by Group

Tests	Mean (SD)			
	Blasts	PTSD	Both	None
<u>TOMM</u>				
Trial 1	46.62 (3.75)	46.06 (4.34)	45.64 (4.63)	46.81 (3.79)
Trial 2	49.73 (0.77)	49.50 (1.14)	49.60 (1.06)	49.68 (1.01)
Retention Trial	49.67 (0.97)	49.56 (1.51)	49.58 (1.07)	49.74 (0.81)
Total N	201	110	349	225

Demographics of Valid Profiles

Demographic	Mean	Median	Mode	Range	SD
Age ^a	26.29	24.00	22.00	18-63	6.46
Education ^a	12.48	12.00	12.00	6-18	1.09
Number of deployments	1.96	2.00	2.00	0-10	1.30
Time since injury ^b	26.58	14.00	12.00	1-156	28.04
<u>ASVAB</u>					
AFQT	61.03	63.00	68.00	23-98	18.15
GT	109.72	111.00	105.00	13-139	11.74
MM	110.32	111.00	111.00	72-166	12.68
CL	99.92	107.00	0.00	0-134	28.78
EL	108.28	109.00	101.00	0-139	12.21

^a Years ^b Months

Note. AFQT = Armed Forced Qualification Test; GT= General Technical; MM= Mechanical Maintenance; CL= Clerical; EL= Electronics

Emotional and Personality Valid Testing Data by Group

Test	Mean (SD)			
	Blasts	PTSD	Both	No
<u>BAI^a</u>				
MMPI-2				
VRIN ^b	34.26 (11.70)	46.15 (13.17)	41.58 (11.19)	36.93 (12.97)
F ^b	51.48 (11.53)	52.48 (9.25)	51.90 (9.99)	52.58 (12.12)
Fb ^b	66.95 (20.38)	86.01 (17.92)	79.43 (18.14)	71.35 (21.31)
Fp ^b	60.84 (19.85)	78.79 (23.49)	73.38 (22.55)	65.46 (22.59)
L ^b	56.66 (14.69)	63.26 (15.74)	62.08 (16.08)	61.31 (18.18)
K ^b	54.54 (9.01)	52.21 (9.03)	51.75 (8.29)	54.00 (10.54)
S ^b	46.33 (9.59)	38.20 (6.69)	39.56 (7.55)	44.34 (9.83)
Hs(1) ^b	44.38 (9.98)	36.20 (6.76)	37.53 (7.33)	42.31 (10.33)
D(2) ^b	68.73 (12.93)	79.96 (13.56)	77.36 (10.66)	69.85 (12.90)
Hy(3) ^b	65.98 (13.62)	79.73 (12.33)	75.63 (12.55)	68.20 (13.87)
Pd(4) ^b	64.94 (13.69)	76.91 (14.59)	73.12 (13.23)	65.99 (15.01)
Mf (5) ^b	58.45 (12.65)	68.26 (13.35)	64.22 (12.02)	61.62 (13.43)
Pa (6) ^b	42.04 (8.76)	47.14 (8.01)	45.58 (8.44)	44.68 (9.91)
Pt (7) ^b	56.30 (15.36)	70.42 (17.56)	65.94 (15.01)	60.49 (16.51)
Sc (8) ^b	63.82 (16.46)	78.96 (13.57)	74.29 (13.95)	65.94 (15.47)
Ma (9) ^b	68.82 (19.00)	86.52 (15.28)	81.14 (15.79)	72.99 (17.75)
Si (0) ^b	59.46 (13.20)	64.04 (12.27)	63.41 (13.02)	62.21 (13.91)
PK ^b	55.79 (11.93)	64.90 (10.87)	63.12 (11.28)	57.58 (12.37)
MMPI-2-RF				
RCd ^b	65.50 (17.86)	86.46 (13.00)	81.37 (14.78)	69.16 (17.40)
RC1 ^b	57.21 (12.65)	68.70 (10.98)	66.57 (11.33)	60.68 (13.73)
RC1 ^b	68.43 (12.57)	79.77 (12.91)	78.23 (10.56)	69.95 (13.55)
RC2 ^b	59.34 (15.58)	71.80 (13.60)	67.58 (14.59)	61.65 (15.89)
RC3 ^b	59.34 (15.58)	71.80 (13.60)	67.58 (14.59)	61.65 (15.89)
RC4 ^b	57.01 (11.21)	62.05 (10.81)	63.37 (10.98)	59.53 (11.41)
RC5 ^b	56.74 (10.83)	62.10 (11.77)	61.79 (11.36)	59.65 (11.12)
RC6 ^b	57.51 (15.22)	68.14 (15.66)	64.85 (13.24)	63.11 (16.24)
RC7 ^b	54.03 (13.45)	64.82 (13.07)	63.95 (12.17)	56.77 (14.53)
RC8 ^b	54.03 (13.45)	71.34 (13.67)	68.58 (12.54)	62.05 (13.78)
RC9 ^b	55.48 (11.32)	60.25 (13.67)	60.26 (11.35)	57.37 (11.98)
VRIN-r ^b	53.03 (10.99)	54.00 (10.58)	53.64 (9.71)	53.88 (12.51)
TRIN-r ^b	64.28 (12.97)	67.74 (14.83)	65.71 (13.07)	67.73 (16.16)
F-r ^b	73.54 (22.36)	93.58 (20.99)	89.28 (20.99)	77.40 (23.04)
Fp-r ^b	63.22 (18.29)	72.85 (17.81)	71.69 (17.22)	66.12 (19.32)
Fs ^b	70.15 (19.83)	88.30 (19.77)	83.97 (19.26)	74.04 (20.88)
FBS-r ^b	63.36 (13.48)	76.62 (13.01)	73.24 (11.60)	64.35 (14.11)
RBS ^b	63.36 (13.48)	76.62 (13.01)	87.29 (17.00)	76.46 (18.71)
L-r ^b	56.50 (8.91)	54.63 (9.17)	53.73 (8.42)	54.96 (10.12)
K-r ^b	44.95 (10.54)	36.53 (7.68)	38.13 (7.80)	42.58 (9.97)

Test	Mean (SD)			
	Blasts	PTSD	Both	No
<u>TSI</u>				
Atypical response ^b	48.97 (10.20)	47.53 (10.79)	46.22 (9.99)	46.59 (7.53)
Response level ^b	50.10 (7.65)	51.54 (9.21)	51.17 (7.68)	50.93 (9.19)
Inconsistent response ^b	53.23 (12.37)	65.93 (17.96)	62.57 (14.04)	59.85 (16.29)
Anxious arousal ^b	57.70 (11.17)	66.41 (8.37)	66.80 (8.35)	59.30 (11.61)
Depression ^b	50.35 (10.11)	60.16 (9.74)	58.07 (10.62)	54.69 (11.46)
Anger/irritability ^b	58.63 (13.10)	68.87 (9.81)	69.09 (9.58)	62.03 (12.67)
Intrusive experiences ^b	59.32 (13.05)	72.05 (11.44)	71.39 (11.09)	62.54 (13.30)
Defensive avoidance ^b	54.19 (10.63)	65.46 (8.33)	64.26 (9.13)	57.45 (9.86)
Dissociation ^b	58.41 (12.81)	70.45 (11.80)	68.74 (11.37)	62.85 (12.29)
Sexual concerns ^b	50.08 (8.74)	55.95 (10.87)	54.96 (11.42)	52.26 (10.82)
Dysfunctional sexual ^b	52.30 (11.26)	58.36 (14.41)	56.61 (13.25)	55.75 (13.27)
Impaired self-reference ^b	53.28 (10.94)	64.08 (10.05)	61.66 (9.96)	57.81 (11.98)
Tension reduction ^b	54.15 (11.52)	64.51 (13.38)	62.74 (12.98)	57.30 (13.37)
Zung ^a	43.38 (10.53)	41.57 (5.16)	51.35 (8.83)	46.50 (10.30)
Total N	201	110	349	225

^a Total score ^b T score; VRIN=Variable Response Inconsistency; F=Infrequency; Fb= Back F; Fp=Infrequency-Psychopathology; L=Lie; K=Correction; S=Superlative Self Presentation; Hs=Hypochondriasis; D=Depression; Hy=Hysteria; Pd=Psychopathic Deviate; Mf=Masculinity/Femininity; Pa=Paranoia; Pt=Psychasthenia; Sc=Schizophrenia; Ma=Hypomania; Si=Social Introversion; PK=PTSD

Motor Testing Valid Data of Blasts/PTSD Groups

Test	Mean (SD)			
	Blasts	PTSD	Both	None
<u>Grip Strength (Kg)</u>				
Right hand ^a	45.74(9.39)	44.49(9.11)	46.05(9.10)	43.27(11.68)
Left hand ^a	45.19(7.50)	43.01(11.17)	42.93(8.22)	41.22(10.80)
<u>Grooved Pegboard (Second)</u>				
Dominant hand ^b	73.38(14.89)	77.75(17.85)	75.39(15.62)	74.44(13.48)
Non-dominant hand ^b	78.31(17.06)	82.81(28.10)	79.68(17.78)	79.11(15.48)
Total N	230	126	402	252

^a Kilograms ^b Seconds

Memory Testing Valid Data of Blasts/PTSD Groups

Test	Mean (SD)			
	Blasts	PTSD	Both	None
<u>CVLT-II</u>				
Trial 1 ^a	5.59 (1.39)	5.86 (1.66)	5.72 (1.51)	5.72 (1.62)
Trial 2 ^a	8.40 (2.01)	8.75 (2.20)	8.55 (1.98)	8.42 (2.21)
Trial 3 ^a	10.31 (2.39)	10.03 (2.38)	10.35 (2.46)	10.08 (2.57)
Trial 4 ^a	11.31 (2.50)	11.11 (2.52)	11.39 (2.36)	11.10 (2.66)
Trial 5 ^a	11.94 (2.55)	11.83 (2.42)	12.04 (2.36)	11.78 (2.49)
Trial 1-5 ^a	47.67 (9.30)	47.43 (9.60)	48.07 (8.89)	47.02 (10.08)
Trial B ^a	5.04 (1.47)	5.28 (1.65)	5.16 (1.50)	5.15 (1.56)
Short delay free recall ^a	10.02 (3.34)	9.52 (3.04)	9.94 (3.12)	9.90 (3.40)
Short delay cued recall ^a	11.20 (2.94)	10.75 (2.71)	11.02 (2.76)	10.78 (3.76)
Long delay free recall ^a	10.13 (3.59)	9.63 (3.44)	9.95 (3.38)	9.83 (3.85)
Long delay cued recall ^a	11.06 (3.29)	10.40 (3.02)	10.79 (3.07)	10.39 (3.57)
<u>WMS-III (Index)</u>				
Auditory immediate	85.64(26.76)	80.98(25.00)	84.81(27.83)	81.00(32.94)
Visual immediate	94.02(15.26)	92.88(16.80)	94.95(14.78)	94.64(17.02)
Immediate memory	94.31(15.65)	90.86(15.91)	94.34(14.94)	95.18(17.05)
Auditory delayed	97.13(14.83)	94.65(13.06)	96.37(14.05)	97.66(16.98)
Visual delayed	93.80(16.09)	93.73(15.69)	93.93(14.35)	94.70(17.55)
Auditory recog. delayed	94.94(16.36)	95.37(15.36)	96.58(14.77)	96.54(16.44)
General memory	95.52(16.30)	95.35(15.87)	96.53(14.74)	95.58(17.31)
Working memory	97.26(16.07)	95.76(11.43)	97.53(12.66)	97.16(16.05)
<u>WMS-IV (Index)</u>				
Auditory memory	94.38(13.92)	89.53(12.50)	93.28(14.14)	91.94(14.79)
Visual memory	98.08(15.05)	95.92(15.74)	96.29(13.97)	96.60(15.37)
Visual working memory	95.41(12.48)	93.58(13.45)	92.98(13.68)	93.18(12.55)
Immediate memory	96.28(13.51)	91.61(12.72)	94.72(13.64)	93.84(14.88)
Delayed memory	95.53(16.14)	91.19(15.68)	93.60(16.11)	93.32(15.98)
Total N	230	126	402	252

^a Total number of words

Executive Functioning Valid Testing Data by Group

Test	Mean (SD)			
	Blasts	PTSD	Both	None
<u>COWAT</u>				
Letter fluency ^a	32.10 (10.44)	29.84 (9.04)	30.87 (9.52)	32.13 (9.48)
Semantic fluency ^b	10.50 (5.58)	18.52 (5.24)	19.25 (5.07)	20.35 (5.45)
<u>Trail Making Test</u>				
Trail making A ^c	30.89 (13.04)	33.25 (18.31)	32.60 (13.35)	31.91 (12.14)
Trail making B ^c	69.62 (28.42)	78.94 (30.36)	75.20 (29.06)	71.81 (33.35)
<u>Hayling and Brixton Tests</u>				
Sensible sentence ^d	10.66 (14.22)	16.66 (23.89)	12.96 (14.13)	11.31 (12.38)
Unconnected: Speed ^c	35.01 (30.24)	43.83 (41.36)	41.37 (37.23)	32.53 (32.71)
Unconnected: Inhibition ^d	7.52 (10.42)	7.35 (9.18)	7.89 (10.94)	7.31 (11.12)
Spatial anticipation task ^d	13.37 (8.52)	14.40 (6.04)	13.58 (6.01)	14.06 (6.54)
<u>Stroop NST</u>				
Color ^e	112.57 (16.95)	111.03 (27.31)	111.77 (15.56)	111.25 (15.97)
Color word ^e	93.86 (19.52)	85.90 (22.92)	92.05 (20.10)	94.93 (19.45)
Total N	201	110	349	225

^a Total number of words for three trials ^b Total number of words for one trial ^c Seconds

^d Total correct ^e Total number of words

Intelligence and Achievement Valid Testing Data by Group

Test	Mean (SD)			
	Blasts	PTSD	Both	None
<u>WAIS-III (Index)</u>				
Verbal comprehension	102.83 (9.20)	99.04 (6.62)	101.95 (10.32)	104.38 (10.18)
Perceptual organization	106.09 (13.56)	98.24 (10.35)	102.17 (11.61)	102.38 (19.45)
Working memory	99.66 (14.27)	96.02 (14.02)	99.80 (11.78)	99.99 (19.57)
Processing speed	94.94 (12.68)	90.33 (11.98)	95.26 (12.61)	92.13 (18.05)
Full scale	102.91 (12.50)	92.13 (11.23)	97.78 (10.58)	94.70 (19.96)
<u>WAIS-IV (Index)</u>				
Verbal comprehension	97.82 (11.59)	94.60 (9.98)	95.74 (11.09)	93.88 (19.16)
Perceptual reasoning	101.42 (12.44)	102.02 (11.49)	100.69 (12.07)	95.33 (22.65)
Working memory	96.75 (13.29)	92.86 (11.30)	94.26 (12.02)	90.60 (20.55)
Processing speed	91.65 (12.77)	88.00 (13.72)	88.21 (12.44)	87.16 (21.96)
Full scale	96.85 (10.42)	93.66 (9.92)	94.18 (10.82)	96.45 (10.67)
General ability	98.53 (12.17)	98.44 (9.54)	98.69 (10.41)	98.11 (10.79)
<u>WRAT-4 (Standard Score)</u>				
Word reading ^a	59.35 (5.20)	58.83 (8.91)	58.62 (5.96)	59.66 (6.25)
Math ^a	42.93 (8.92)	44.70 (16.97)	41.84 (8.06)	44.87 (12.52)
Total N	201	110	349	225

^a Standard Score

Summary & Directions

SUMMARY

1. Clinical & Academic Partnership
2. Blast vs. PTSD

CURRENT ANALYSES

1. Military vs. Non-Military PTSD
2. TSI
3. Neuropsychological performance

FUTURE DIRECTIONS

1. Sharing Data
2. Prospective (vs. retrospective)
3. Determining groups by performance rather than by self-report
4. Screening vs full evaluations



GENERAL ESTIMATED PTSD RATES IN ARABIC CHILDREN

COUNTRY	RATES	AUTHOR(S)
Kuwait	70%	Nader, 1993
Gaza	41%	Thabet & Vostainis, 2000

ESTIMATED PTSD RATES IN WAR ZONES FOR ARABIC CHILDREN

COUNTRY	RATES	ACTIVITY	AUTHOR(S)
Iran	75%	Hanging(s)	Attari et al, 2006)
Palestine	87%	Bombing(s)	Saigh, 1991

Symptoms of PTSD among Children Living in War Zones in Same Cultural Context and Different Situations

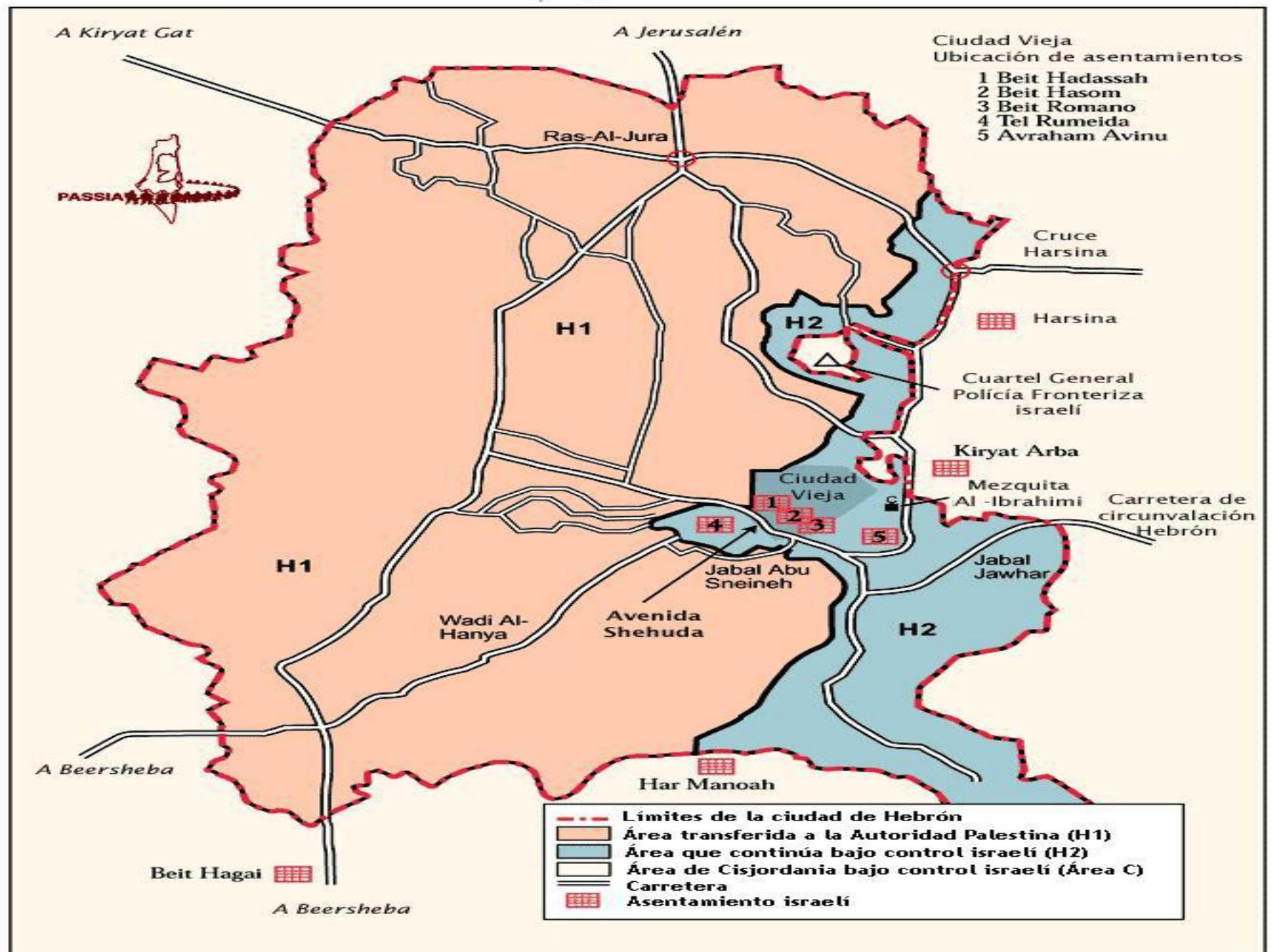
Ahmed F. Fasfous, Isabel Peralta-Ramírez, and Miguel Pérez-García

Faculty of Psychology & Centro de Investigación Mente, Cerebro y Comportamiento
University of Granada, Spain.

Journal of Muslim Mental Health ISSN1556-4908 Volume 7, Issue 2, 2013 <http://hdl.handle.net/2027/spo.10381607.0007.203>

NUMBER OF CHILDREN IN HEBRON

TOTAL NUMBERS	BOYS	GIRLS	TOTAL SCHOOLS
H1 (Palestinian)	1463	1269	59
H2 (Israeli)	671	838	?



Fuente: The Palestinian Academic Society for the Study of International Affairs (PASSIA)

Traducción: Delegación General de Palestina en Argentina

NUMBER OF CHILDREN & PARTICIPANTS x SECTOR

TOTAL	4,341
HI BOYS	190
H1 GIRLS	191
H2 BOYS	69
H2 GIRLS	80

Events X Gender & Sector

Mean # of traumatic events = 6

Boys - 7.10

Girls - 4.96

H1 - 5.76

H2 - 6.44

General PTSD Symptoms

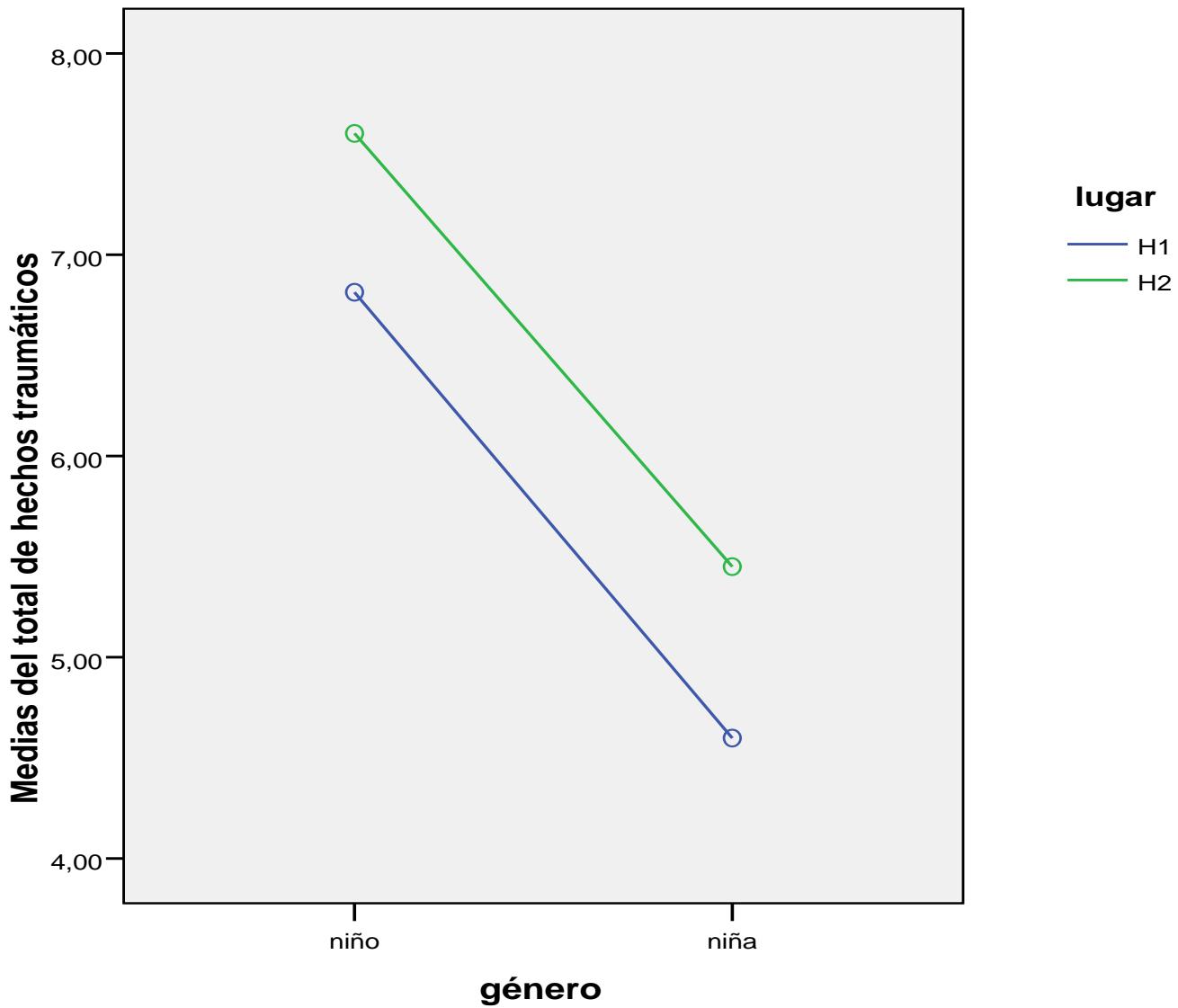
Mean # of Symptoms 34.18

1.8%	(n=7)	No symptoms
16.5 %	(n=63)	Mild
47.0%	(n= 179)	Moderate
30.4%	(n= 116)	Severe
0.5%	(n= 2)	Extreme

*20.5% meet DSM IV PTSD criteria

CPTSD-RI SYMPTOMS (in order of prevalence)

1. Seeing images of dead and injured people on TV
2. Seeing aerial bombings against houses and streets
3. Finding out about the death of a friend at the hands of the Israeli army
4. Waiting for many hours at the checkpoints
5. Finding out that a father, a sibling, or other close family member has been killed by the occupying forces
6. Witnessing the destruction of a friend's home
7. Seeing a friend get hit by a bullet
8. Seeing a friend being hit by soldiers
9. Seeing a father, a sibling, or other family member killed by soldiers
10. Being hit or humiliated by soldiers
11. Seeing soldiers break into your home during the day
12. Seeing soldiers break into your home at night
13. Seeing a friend arrested by soldiers
14. Seeing a parent or a sibling get hit by a bullet
15. Seeing your home being bombed by artillery and heavy weaponry
16. Witnessing the attack of nearby homes by bombs, artillery, or heavy weaponry



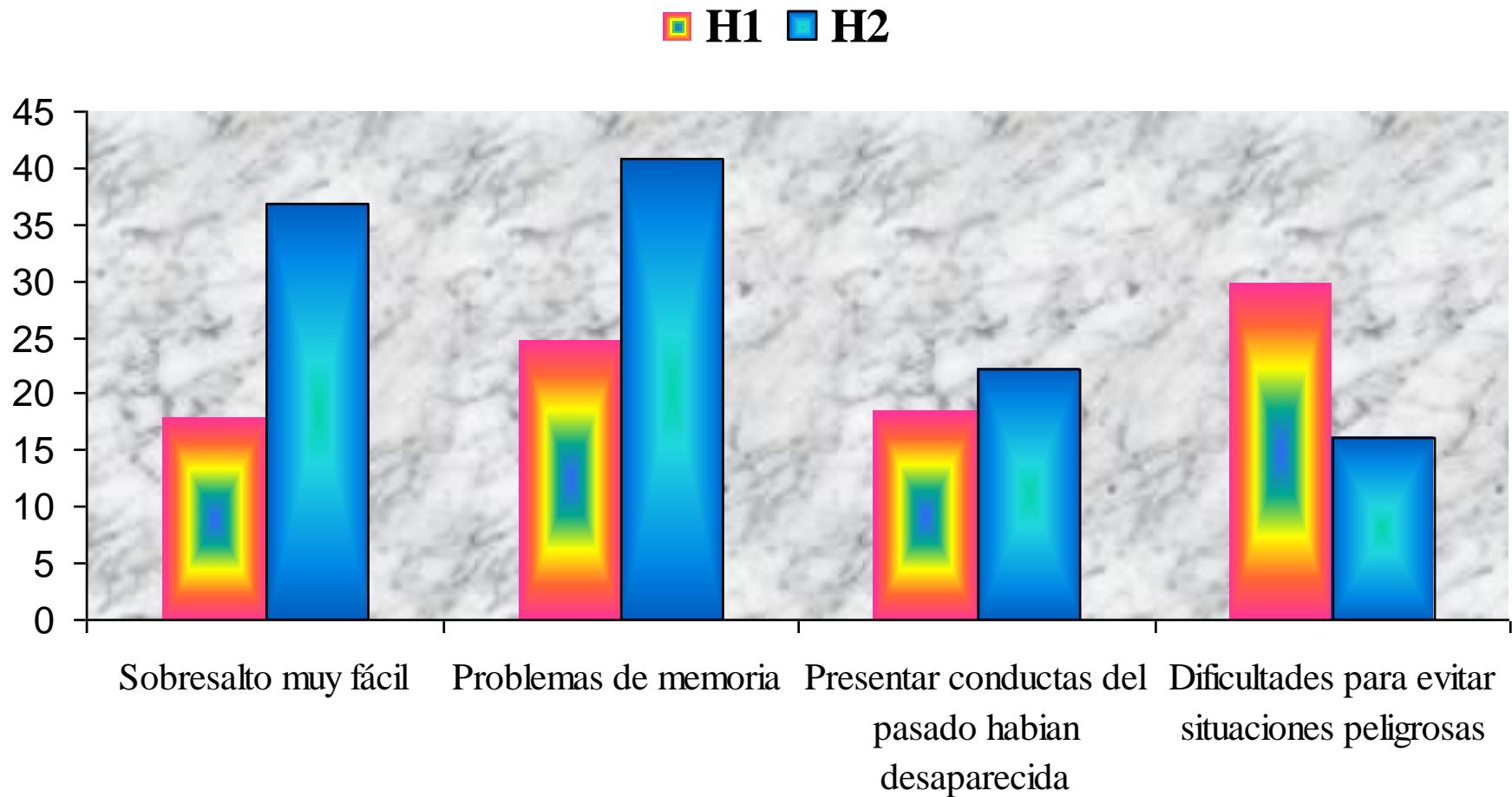
Medias del total de hechos traumáticos dependiendo al lugar y género

Percentage of occurrence and χ^2 of each traumatic event by gender.

THE TRAUMATIC EVENT	% YES	Boys % YES	Girls % YES	χ^2	P
Seeing images of dead and injured people on TV	94.8	94.7	94.8	0.00	0.990
Seeing aerial bombings against houses and streets	80.3	86.3	74.7	8.12	0.004
Finding out about the death of a friend at the hands of the Israeli army	24.1	29.6	18.9	5.88	0.015
Waiting for many hours at the checkpoints	47.0	52.1	42.3	3.63	0.057
Finding out that a father, a sibling or other close family member has been killed by the occupying forces	29.1	31.7	26.7	1.17	0.280
Witnessing the destruction of a friend's home	22.8	27.9	17.9	5.38	0.020
Seeing a friend get hit by a bullet	23.9	35.3	12.6	27.0	0.000
Seeing a friend being hit by soldiers	37.8	47.9	27.7	16.4	0.000
Seeing a father, a sibling or other family member killed by soldiers	11.8	15.3	8.4	4.26	0.039
Being hit or humiliated by soldiers	31.0	42.3	19.9	22.3	0.000
Seeing soldiers break into your home during the day	28.9	31.7	26.2	1.43	0.231
Seeing soldiers break into your home at night	32.5	41.5	24.1	13.0	0.000
Seeing a friend be arrested by soldiers	31.5	40.5	22.5	14.3	0.000
Seeing a parent or a sibling get hit by a bullet	12.6	15.3	9.9	2.44	0.118
Seeing your home being bombed by artillery and heavy weaponry	14.7	18.9	10.5	5.46	0.019
Witnessing the attack of nearby homes by bombs, artillery or heavy weaponry	25.7	31.6	20.0	6.66	0.010
Seeing a parent or a sibling being arrested by soldiers	18.1	22.1	14.2	3.98	0.046
Seeing a parent or a sibling being hit by soldiers	17.8	21.1	14.7	2.66	0.103
Being injured by a (rubber) bullet	10.0	11.1	8.9	0.47	0.494
Witnessing the destruction of your home	9.4	13.2	5.8	6.09	0.014

PTSD BY SECTOR

SECTOR	TYPE OF STRESSOR	SYMPTOMS
H1	<i>Acute</i>	<i>Physiological</i>
H2	<i>Chronic</i>	<i>Neurocognitive</i>



Different Symptoms Between H1 & H2 Sectors

Summary

Average traumatic experiences = 6

77.4% reported either Moderate or Significant Trauma

Boys affected more than girls

No differences in quantity of traumas but in the types and symptoms based on sector location

H1 more acute and physiological

H2 more chronic and neurocognitive

Questions?

Long term consequences of H2 type trauma?

Questions?

Long term consequences of H2 type trauma?

Could such trauma become

Cultural?

Neuropsychological?

Epigenetic?

Questions?

Long term consequences of H2 type trauma?

Could such trauma become

Cultural?

Neuropsychological?

Epigenetic?

Could there be two types of PTSDs?

1. Acute and Emotional/Physiological

2. Chronic and Neurocognitive

Questions?

Long term consequences of H2 type trauma?

Could such trauma become

Cultural?

Neuropsychological?

Epigenetic?

Could there be two types of PTSDs?

1. Acute and Emotional/Physiological
2. Chronic and Neurocognitive

Could neuropsychological constructs explain PTSD? (Kim, 2017)

Puente Contact Information

Websites

Coding =
University =
Practice =
Vita/Academic =

www.psychologycoding.com
www.uncw.edu/people/puente
www.clinicalneuropsychology.us
www.antonioepuente.com

E-mail

University =
Practice =

puente@uncw.edu
clinicalneuropsychology@gmail.com

Telephone

University =
Practice =

910.962.3812
910.509.9371



APA 125
AMERICAN PSYCHOLOGICAL ASSOCIATION