

Original Research

Suicidal Ideation in Police Officers: Exploring an Additional Measure

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Abstract: Police officers are at an increased risk for suicide. Hesitancy by this high risk population to seek help makes it essential to detect suicide ideation on a different level than self-reports. This pilot study was an effort to explore the potential for an additional measure, the suicide Implicit Association Test (IAT), to detect suicidal ideation in police officers. The IAT measures levels of identification with life or death. In terms of self-reported suicide ideation, none was reported by officers. Results from the IAT measure suggested that officers had differing levels of identification with life: slight (18.5%), moderate (32.3%), and strong (29.2%). 14% were neutral in their identification with life, and 6% identified with death. Self-reported suicide ideation, depression and posttraumatic stress disorder (PTSD) did not significantly correlate with IAT scores, suggesting that the IAT is distinct from self-report tools, measuring attitudes toward life and death below the conscious level. More research is needed to help clarify the operational usefulness of IAT methods and their validity over time.

Keywords: Police, suicide, detection, prevention

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Although some controversy exists over exact police rates, epidemiological evidence suggests that suicide is somewhat elevated within law enforcement

(Guralnick, 1963; Milham, 1979; Vena, Violanti, Marshall & Fiedler, 1986; Lester, 1992; Forastiere, Perucci, Di Pietro, Miclei, Rapiti, Bargagli, et al, 1994). Violanti, Vena, and Marshall (1996) found that male police officers had a suicide rate of 8.3 times that of homicide and 3.1 times that of work accidents. Other studies have found increased rates of police suicide outside of the United States (Hartwig & Violanti, 1999; Cantor, Tyman & Salter, 1995; Charbonneau, 2000). Gershon, Lin, and Li (2002) found officer to have an approximate 4-fold risk of being exposed to

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traumatic work events, a 3-fold risk of exhibiting PTSD symptoms, a 4-fold risk of alcohol abuse, and a 4-fold risk of aggressive behavior.

Despite the reported increased risk of suicide among police officers, methods for accurately identifying those at risk are limited. This population is hesitant to divulge sensitive information to mental health professionals or others for fear that it may compromise their job position or safety. This hesitancy may in kind be related to the strong influence of the police culture, which prescribes an ethos of invulnerability to emotional harm. Given reluctance to self-report suicidal thoughts or behaviors, it becomes essential to detect suicide ideation on a different level in this high suicide risk population.

Over the past several years, psychologists have developed methods for measuring the strength of automatic associations that individuals hold between various concepts, referred to as implicit associations (Fazio & Olson, 2003). One method for measuring such associations is the Implicit Association Test (IAT), a computerized, performance-based reaction time task that requires individuals to classify different stimuli (i.e., words or images appearing in the middle of the computer screen) into concept categories (indicated on the upper left and upper right corners of the screen) by pressing either a left or right key on a computer keyboard. In an IAT, concept categories are paired and the task compares the speed at which an individual classifies stimuli when the paired categories match an individual's implicit associations versus the speed of classification when the paired categories do not match an individual's implicit associations (see Project Implicit, www.implicit.harvard.edu for a detailed explanation of IAT and samples of IAT programs) (Nosek, Greenwald, & Banaji, 2005; Greenwald, Nosek, & Banaji, 2003).

The IAT has been used to study an increasing array of phenomenon over the seven years since its development. Although there are still questions about the precise processes underlying IAT effects (Fazio & Olson, 2003), the stability of IAT effects (Blair, 2002), and the relations between implicit and explicit measures of constructs (Brauer, Wasel & Neiedenthal, 2000), several positive aspects of the IAT that have been well-documented in the literature make it a potentially useful tool for suicide assessment.

This study was an effort to evaluate the potential for using IAT to detect suicidal ideation in a treatment resistant population at increased risk for suicide. A suicide Implicit Association Test (IAT) was used to evaluate the extent to which officers associated suicide as being "good" versus "bad" and "like me" versus "not like me," based on the strength

of their identification with life or death (Nock, Park, Finn, Deliberto, Dour, & Banaji, 2010). Implicit associations were then compared to explicit self-report measures which assessed suicidal tendencies and thoughts. The Suicidal Ideation Scale, Posttraumatic Stress (PTSD) and depressive symptoms, covariates thought to be associated with police suicide, were also examined to determine associations (refer to the methods section for a description of covariates). A Visual Analog Scale (VAS) was also completed by participants. The primary purpose of the VAS was to use it as a validation measure for the IAT. The concepts named in the VAS scale were the same as the IAT algorithm as partially described in table 1. There is no specific arrangement of these variables.

Methods

Sample

A sample of 100 sworn police officers from several departments in a county was invited to participate in this proposed study. Seventy two (72%, n=72) police officers agreed to voluntarily participate in the study, n=65 of whom had complete data and were used for analysis. Officers who did not volunteer were not demographically different than those who did. Participants provided demographic information, responses to the IAT, and filled out a series of questionnaires. The study was reviewed and approved by a full IRB board at the university study site. Volunteer participants signed a consent form agreeing to participate in the study.

Measures

Implicit Association Test (IAT) – The suicide IAT algorithm used for this study was developed by Nock, Banaji, Deliberto, Park, & Finn (2007). Prior testing of the IAT algorithm suggested that people who have attempted suicide hold a significantly stronger implicit association between death/suicide and self on the IAT than do those who have not attempted suicide. Moreover, the implicit association of death/suicide with self was associated with an approximately 6-fold increase in the odds of making a suicide attempt in the next 6 months, exceeding the predictive validity of known risk factors (e.g., depression, suicide-attempt history) and both patients' and clinicians' predictions (Nock, et al 2010). Officers were instructed to respond to words on a computerized, performance-based reaction time task that requires individuals to classify different stimuli (i.e., words or images appearing in the middle of the computer screen) into concept categories (indicated on the upper left and upper right corners of the screen) by pressing either left or right key on a

computer keyboard. Officers first completed a practice IAT in which they classified “flowers” and “insects” in order to ensure understanding of and familiarity with the IAT procedure. Participants then completed critical IATs that evaluated identification with life, death, and suicide. These included concept categories of “suicide” vs. “life,” “stay” vs. “go,” and “suicide” versus “disease.” We tested two groups of attribute categories in the current study, including “good” vs. “bad” and “like me” vs. “not like me.” These yielded information about the magnitude to which individuals associate suicide (and related life-death concepts) with being “good” and “like me.” Faster response times were interpreted as stronger mental associations between constructs. Table one provides an example of concept words on the IAT used in this study.

Table 1. Sample items of police suicide IAT life-death associations.

DEATH	LIFE	ME	NOT ME
Suicide	Alive	I	They
Die	Live	Myself	Them
Dead	Survive	My	Their
Deceased	Thrive	Mine	Other

Covariates

Scale for Suicidal Ideation (SSI) – The Beck Suicide Ideation Scale (Beck, Kovacs & Weissman, 1979) was used to evaluate suicidal thoughts. The SSI is a widely-used, 19-item administered measure that inquires about various aspects of current suicidal ideation.

Posttraumatic Stress – Many work related exposures of police officers are traumatic (Paton, Violanti & Smith, 2003). Faced with responding to fatal accidents, crime, child abuse, homicide, suicide, and rape, police officers are exposed to all the potential factors that can precipitate a traumatic response (Carlier, Lamberts & Gersons, 2000) [13-14]. The PTSD (Posttraumatic Stress Disorder) Checklist (Weathers, Litz, Herman, Huska & Keane, 1993) is one of the most widely used measures of PTSD symptoms. Data indicate the internal consistency, coefficients of the PCL are typically high (.80 to .97), depending on whether subscale or total scores are used. Reports of PTSD demonstrate moderate to high test–retest reliability over time in this population.

Depressive symptoms – Depression is considered a significant predictor of suicide ideation (DeFillipo & Overholser, 2000; Simon, Anderson, Thompson, Crosby & Sacks, 2002; Joiner & Rudd, 1995; Rudd, Dahm & Rahab, 1993; Green, Lindy & Grace, 1989). Hartley, Violanti, Fekedulgen, Andrew,

and Burchfiel (2007) found that exposure to multiple negative life events were significantly associated with elevated depression scores in police officers. The Center for Epidemiological Depression (CES-D) scale (Radloff, 1977) is a 20-item measure of depressive symptoms. Officers were asked to rate items on a 4-point scale according to how often the symptom occurred in the past 7 days: 1 (rarely or none of the time, less than 1 day), 2 (some or little of the time, 1 – 2 days), 3 (occasionally or a moderate amount of the time, 3 – 4 days), and 5 (most of all of the time, 5 – 7 days). Scores for the CES-D range from 0 to 60. Respondents with scores between 0-15 are considered unlikely to be clinically depressed, and a score of 16 or higher has been used to indicate presence of depression. The CES-D has acceptable reliability (Chronbach alpha of 0.85), and a split-half reliability ranging from 0.76 to 0.85 (Radloff, 1977).

Visual Analogue Scale (VAS) – An additional measure was used to assess explicit information about possible suicidal thoughts including hope, escape, the future, sickness, and death. A Visual Analogue Scale (VAS) 100 mm in length anchored by word descriptors at each end was used to assess these factors. The VAS score was determined by measuring in millimeters from the left hand end of the line to the point that the patient marks. The starting point of the VAS is “0” at the left (beginning) point and “100” at the right (end) (Wewers & Lowe, 1990).

Analysis

Descriptive statistics were used to characterize the study population. Frequencies and mean values of relevant demographic and lifestyle characteristics as well as psychosocial measures were included in the analysis. An IAT scoring algorithm outlined by Greenwald, Nosek, and Banaji (2003) was used in this study. The results were calculated as D-scores which correspond to small, medium, and large effect sizes. D-score and Cohen's d are related measures. The D-Score cut-points developed for the suicide IAT algorithm were (Nock, et al, 2007):

- < -.065 strong identification with death, me, suicide
- 0.35 to -.065 moderate identification with death, me, suicide
- 0.15 to -0.35 slight identification with death, me, suicide
- 0.15 to + 0.15 neutral
- + 0.15 to +0.35 slight identification with life, good, me
- +0.35 to +0.65 moderate identification with life, good, me
- > +0.65 strong identification with life, good, me

Additionally, a correlation analysis between IAT scores and explicit measures of depression (CESD), PTSD symptoms (PCL), and suicide ideation was used to attempt to detect whether implicit IAT scores were different from explicit measures.

Table 2. Police sample: Demographic and life style characteristics

Characteristics	Women	Men	Total
	N = 22	N = 43	N = 65
	N (%)	N (%)	N (%)
Age group (years)			
< 34	5 (22.7)	8 (19.1)	13 (20.3)
35-44	12 (54.6)	18 (42.9)	30 (46.9)
≥ 45	5 (22.7)	16 (38.1)	21 (32.8)
Race			
White	21 (95.5)	39 (95.1)	60 (95.2)
Black	1 (4.5)	1 (2.4)	2 (3.2)
Hispanic	0 (0.0)	1 (2.4)	1 (1.6)
Education			
≤ High school/GED	2 (9.1)	3 (7.0)	5 (7.7)
College < 4 yrs	9 (40.9)	27 (62.8)	36 (55.4)
College 4+ yrs	11 (50.0)	13 (30.2)	24 (36.9)
Marital status			
Single	7 (31.8)	7 (16.3)	14 (21.5)
Married	12 (54.6)	34 (79.0)	46 (70.8)
Divorced	3 (13.6)	2 (4.7)	5 (7.7)
Years of Service			
<5	5 (22.7)	5 (11.9)	10 (15.6)
6-10	5 (22.7)	8 (19.1)	13 (20.3)
11-15	3 (13.6)	11 (26.1)	14 (21.9)
15<	9 (40.9)	18 (42.9)	27 (42.2)
Military (yes)	2 (9.1)	13 (30.2)	15 (23.1)
Rank			
Police officer	18 (81.8)	30 (69.9)	48 (73.9)
Sergeant/Lieutenant	3 (13.6)	6 (13.9)	9 (13.9)
Captain/Detective	1 (4.6)	6 (13.9)	7 (10.8)
Other	0 (0.0)	1 (2.3)	1 (1.5)
	Mean (SD)	Mean (SD)	Mean (SD)
Age (years)	41.1 (7.2)	41.7 (8.3)	41.5 (7.9)
Years of service	12.7 (7.6)	14.7 (8.2)	14.0 (8.0)

All data analyses were performed using SAS version 9.2 (SAS Institute, Cary, NC). Power analysis revealed that sample size of N=65 would be sufficient to detect minimum correlation of $r=0.34$ for continuous

independent and dependent variables to maintain adequate statistical power of 80% with $p < 0.05$ significance.

Table 3. Police IAT D-score categories.

Life/Death D-scores		Police Officers		
		Women (N=22)	Men (N=43)	Total (N=65)
		N (%)	N (%)	N (%)
Strong ID with Life	[> +0.65]	5 (22.7)	14 (32.6)	19 (29.2)
Mod ID with Life	[+0.35, +0.65]	9 (40.9)	12 (27.9)	21 (32.3)
Slight ID with Life	[+0.15, +0.35]	4 (18.2)	8 (18.6)	12 (18.5)
Neutral	[-0.15, +0.15]	2 (9.1)	7 (16.3)	9 (13.9)
Slight ID with Death	[-0.35, -0.15]	1 (4.6)	0 (0.0)	1 (1.5)
Mod ID with Death	[-0.65, -0.35]	1 (4.6)	2 (4.7)	3 (4.6)
Strong ID with Death	[< -0.65]	0 (0.0)	0 (0.0)	0 (0.0)

Table 4. Mean CES-D and PTSD scores across the categories of IAT D-scores.

Life/Death D-scores		Explicit Measures					
		CES-D			PTSD		
		N	Mean	SD	N	Mean	SD
Strong ID with Life	[> +0.65]	17	7,52	8,7	18	27	8,96
Mod ID with Life	[+0.35, +0.65]	21	6,52	6,08	19	23,42	8,24
Slight ID with Life	[+0.15, +0.35]	12	7,83	6,29	11	29,45	11,59
Neutral	[-0.15, +0.15]	9	4,89	3,44	9	26,56	6,71
Slight ID with Death	[-0.35, -0.15]	1	15	--	1	46,66	--
Mod ID with Death	[-0.65, -0.35]	3	7,67	11,6	3	27,33	8,08
Strong ID with Death	[< -0.65]	0	0	0	0	0	0
p value [†]		0,91			0,45		

† P value from Pearson's correlation coefficient on continuous D-scores, CES-D and PTSD checklist values.

Results

The sample consisted mostly of males (66%), approximately 95% Caucasian, 3% African-American, and 2% Hispanic individuals, and ranged in age from 22-65 years. The majority of the sample were married (70%), at the rank of patrol officer (73%) and had fifteen or more years of police service (42%). Other than gender, there were no meaningful associations between demographic factors and IAT scores (Table 2).

Table three provides IAT D-scores for the total sample and across gender categories. Officers had a slight (18.5%), moderate (32.3%), or strong identification with life (29.2%). 14% were neutral in their identification with life, and 6% had a slight or moderate identification with death. Overall, 77.3% of women and 67.4% of male officers had a less than strong identification with life.

Self-reported depression and PTSD symptom scores had no significant associations with IAT D-scores (Table 4). With the exception of one

participant, self-reported mean depression scores were lower on those who had IAT tendencies toward death. Where no significant correlations were seen between self-reported depression, PTSD and IAT scores (Table 5). Responses on the Beck Scale for Suicide Ideation (SSI) are not shown since none (0%) of the respondent's self-reported suicidal thinking.

Table five provides the prevalence of depression and PTSD across IAT D-scores. There was no significant association.

The VAS was used as validation for the IAT variables. There was a significant correlation between increased hope (as opposed to despair) and IAT identification with life ($r=.291$, $p<0.05$). Other VAS scores also demonstrated congruence with IAT identification with life (escape opposed to stay: $r= -.291$; $p<0.05$; future-good opposed to bad: $r= -.283$; $p<0.05$; and suicide- me or not me: $r= -.267$; $p<0.05$) (Table 6).

Table 5. Prevalence of Depression and PTSD across IAT D-scores.

Life/Death D-scores		Prevalence (%)			
		N	Depression*	N	PTSD**
Strong ID with Life	[> +0.65]	17	11.76%	18	11.11%
Mod ID with Life	[+0.35, +0.65]	21	9.52%	19	5.26%
Slight ID with Life	[+0.15, +0.35]	12	8.33%	11	18.18%
Neutral	[-0.15, +0.15]	9	0.00%	9	0.00%
Slight ID with Death	[-0.35, -0.15]	1	NA	1	NA
Mod ID with Death	[-0.65, -0.35]	3	33.3%	3	0.00%
Strong ID with Death	[< -0.65]	0	NA	0	NA

*Based on CES-D score ≥ 16 ** Based on PTSD checklist score ≥ 44 **Table 6. Correlations: Visual Analogue Scales with IAT D-Scores, N=65.**

Visual Analogue Scale Range	Pearson Correlation
Other Death type – Suicide	0.081
Despair – Hope	0.291*
Stay –Escape	- 0.291*
Future – Bad or good	0.283*
Future- Me or Not Me	- 0.267*
Sickness – Death	0.065
Death – Life	0.178
Life Bad – Life Good	0.194

* $p < 0.05$; Visual Analog Scale = "0" to "100" mm is marked by participants from left to right

Discussion

An implicit below conscious level association with death may represent one of the final steps in the pathway to suicide that is activated when a police officer is deciding how to respond to extreme or chronic distress (Nock, 2009; Nock, et al, 2010). In the occupation of policing, where officers are hesitant to seek help due to police cultural stigma among peers and job consequences, detecting suicide is difficult. In addition, officers may believe that reporting mental health problems or suicidal thoughts will affect their careers in areas of promotion and assignments (Violanti, 2007).

The suicide IAT has not been previously tested with police officers. It has, however, previously been tested in adult populations consisting of persons seeking treatment in a psychiatric emergency department (Nock, et al, 2007). Nock, et al (2010) found implicit association of death/suicide with self was associated with an approximate 6-fold increase in the odds of making a suicide attempt in the next 6 months, exceeding the predictive validity of known risk factors (e.g., depression) (Nock, 2010). These

results suggest that measures of implicit associations with life or death may be useful for detecting and predicting sensitive suicidal behaviors that are unlikely to be reported.

Our results suggested that the IAT may be somewhat more useful in detecting suicidal ideation among police officers than self-report information. The lack of an association between prediction and suicidal behavior is consistent with research on the limited value of self-report data (Nock, 2010; Dawes, Faust & Meehl, 1989). Given the healthy and tested psychological status of police officers one would expect few, if any, officers to report suicidal ideation. This was reflected by the self-report measure of suicide ideation used in this study in which None (0%) of the officers reported suicide ideation. As seen in Table 3, there were thirteen officers who had either a neutral in identification with life or a stronger association with death than life who were not picked up by the Scale for Suicidal Ideation. Regarding covariates, our assumption was that PTSD and depression would correlate with IAT scores based on previous research that they increased suicide ideation in police officers (Violanti, 2004). The findings

suggested, however, that lower IAT scores (lesser association with life) had no significant associations with increased levels of either PTSD or depression.

The present study also took a first look at implicit suicide cognitions in women officers. Although the sample of women is small ($n=22$), results indicated that four women officers (18%) had an IAT score at the neutral level or had a stronger identification with death than life. Future research may indicate a possible increase in police women suicides and further assessment is warranted.

VAS analogue scales were used as an additional measure to help assess the validity of IAT scores. VAS factors included comparisons of hope, escape, the future, sickness, and death. VAS scales appeared to be more congruent with IAT scores than did self-reported suicide ideation, depression and PTSD measures. For example, there was a significant correlation ($r=.291$, $p<0.05$) between increased hope (as opposed to despair) and identification with life. This suggests that positive VAS variables correlated well with IAT scores that had high identification with life. Other VAS scores demonstrated congruence with IAT identification with life (escape opposed to stay: $r=-.291$; $p<0.05$; future-good opposed to bad: $r=-.283$; $p<0.05$; suicide- me or not me: $r=-.267$; $p<0.05$). Because of significant correlations of VAS items with the IAT, the VAS measure may be an acceptable substitute for self-report measures of suicide among police officers along with the IAT. VAS measures may be especially useful in future longitudinal studies.

Limitations

Results should be interpreted with caution. Participants in this study were from one geographic area which may limit generalizability. However, it should be noted that police work tends to share common problems and exposures which may increase the risk of suicide. Police work is a fertile ground for suicide, with chronic stress, traumatic incident exposure, availability of firearms, and a general mistrust and use of mental health professionals (Violanti, 2007).

Our sample was limited and cross sectional. Verification of the IAT as a tool in suicide prevention needs further inquiry with larger samples. Longitudinal studies are needed to verify results of IAT effectiveness and validity over time. As pointed out by Nock, et al, the stimuli used in the IAT focuses mostly on death (Nock et al, 2010). They suggest that future versions targeting suicide-related cognitions more narrowly may provide even better prediction and require testing in subsequent studies. Nock, et al (2007) also suggest to combine IAT information with other data sources (e.g., biological or historical) to advance the understanding, prediction, and prevention of suicidal behavior. It is also possible that

the frequent exposure to death by police officers in their work may influence their responses. Officers are exposed to death during the investigation of suicides, unattended deaths, traffic accidents, and homicides. Thoughts about life may be counterbalanced by a death exposure-based desensitization process.

In summary, the present study suggests that police officers have a varied identification with life and death. Four of the officers (6%) had a stronger identification with death than life, indicated by their negative IAT scores. This result is unusual in a psychologically tested working population and suggests that, to some degree, the IAT may be sensitive in detecting possible suicidal thinking. Additionally, in comparison, self-report measures of suicide in this study yielded zero results. Not one officer reported that he or she had suicidal thoughts. Future research may lead to better entrance screening assessment measures, improved suicide prediction, and to more effective intervention approaches. Accurate assessment and detection of suicidal thinking in police officers may eventually tell us something more about suicidal behavior within this occupation.

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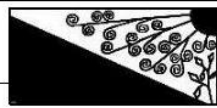
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