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Improving police officer and justice personnel attitudes and de-escalation skills:

A pilot study of Policing the Teen Brain

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Abstract

This pilot study assessed whether police officers and juvenile justice personnel reported improved attitudes toward youth and knowledge about de-escalation skills after attending “Policing the Teen Brain,” a training created to prevent arrests by improving officer-youth interactions. Pre- and post-intervention surveys asked about participant attitudes toward adolescents, adolescence as a stressful stage, and punishing youth in the justice system. Among the 232 participants, paired sample t-tests indicated significant differences between mean pre- and post-survey responses on nearly all survey subscales. A hierarchical regression model significantly predicted improvement in knowledge, with educated, female participants most likely to improve knowledge of de-escalation skills.

Improving officer attitudes and de-escalation skills: A pilot study of Policing the Teen Brain

More than 1.3 million US adolescents are arrested annually (*OJJDP Statistical Briefing Book*, 2014), and 1 in 3 US youth will be arrested by age 23 (Brame, Turner, Paternoster, & Bushway, 2012). Arrest typically marks the beginning of formal youth involvement in the justice system (Skowrya & Coccozza, 2006), such that the police officers who arrest these youths are the first point of contact, or “gatekeepers,” to the system (Goodrich, Anderson, & LaMotte, 2014; Liederbach, 2007). Officers commonly interact with youth in their law enforcement duties, serving as first responders to crises within communities (Compton et al., 2014), including disturbances instigated by adolescents (Snyder & McCurley, 2008). In a longitudinal study of school referrals to juvenile court in 5 states, Krezmien and colleagues (2010) found an increase in school-based referrals across times. It should be noted that further research finds schools have placed increased pressure on school resource officers to manage the behavior of youth (May, Barranco, Stokes, Robertson, & Haynes, 2015).” National statistics confirm that police officers are likely to encounter adolescents on the job, as youth are overrepresented both as perpetrators and victims of crime (Sickmund & Puzanchera, 2014). In a survey of police-youth interactions in Chicago, 58% of adolescent respondents reported being stopped by police at least once in the previous year (Friedman, Lurigio, Greenleaf, & Albertson, 2004). During their encounters with youth, police officers exercise discretion to decide whether a juvenile should be formally processed or released without record (Petrosino, Turpin-Petrosino, & Guckenburg, 2010), with lasting implications for youth and their communities.

Arrest of youth by a police officer has been directly and indirectly associated with future delinquency. In a longitudinal study by Liberman and colleagues (2014), propensity matching was used to show that adolescents’ first arrest was independently predictive of re-arrests, even after controlling for a youth’s self-reported offending. In other words, first arrest “appears to increase subsequent law enforcement responses to those youth compared to other youth who are offending at a comparable level but managed to evade a first arrest” (Liberman, Kirk, & Kim, 2014, p. 24). Lopes and colleagues (2012) similarly found that, after accounting for individual youth and case characteristics, formal contact with

police during adolescence (ages 14-19) was indirectly related to illegal drug use and unemployment more than 10 years later (Lopes et al., 2012). Among similar findings (Tyler, Fagan, & Geller, 2014; Wiley & Esbensen, 2013), Slocum and colleagues (2016) demonstrated that the association between police contact and continued delinquency was partially accounted for by adolescents' dissatisfaction with police.

The relationship between police and youth has been historically contentious, characterized by power struggles, mutual disrespect, and hostility (Friedman et al., 2004). Youth have repeatedly been found to hold unfavorable opinions about police (Brunson & Weitzer, 2009; Carr, Napolitano, & Keating, 2007). While there is little research reporting police officers' general attitudes toward youth (Goodrich et al., 2014), youth perceptions of law enforcement as unfair or illegitimate likely feed into reciprocally antagonistic encounters (Friedman et al., 2004). Youth who view police negatively are more likely to react with contempt toward police and are less likely to cooperate with or seek help from them in the future (Kirk & Matsuda, 2011; Tyler et al., 2014). In turn, police officers are more likely to assert their authority (Brown, Novak, & Frank, 2009) or arrest youth (Liederbach, 2007) when they interpret youth behavior as disrespectful or uncooperative. This maladaptive cycle between youth and police has spurred interventions to improve encounters between them (Goodrich et al., 2014).

One widespread and tested program involving police officers, Crisis Intervention Teams (CIT), lends support for intervening with law enforcement to prevent justice system involvement. CIT is an officer training initiative first designed to divert mentally ill adults from the justice system, with the primary goal of reducing arrest and incarceration of those who may benefit from social services (Steadman, Deane, Borum, & Morrissey, 2000). Past program evaluations of CIT have shown increased police officer knowledge of issues related to mental illness and improved perceptions of the mentally ill (Compton et al., 2014). On average, CIT also appears related to fewer self-reported arrests (as opposed to official arrest records) of mentally ill subjects by officers (Taheri, 2014). Since 2010, the National Association of Mental Illness (NAMI) has applied CIT principles with youth, and a preliminary study of CIT-Youth in Chicago demonstrated some initial program success in increasing police officer knowledge of mental illness symptoms in youth (Campbell, 2012).

Police officer trainings specifically designed to reduce the arrest rates of youth, especially minority youth, have been implemented in Connecticut (Goodrich et al., 2014). Two studies of the program, “Effective Police Interactions with Youth,” demonstrated support for introducing police officers to developmental information about adolescents. Compared to pre-intervention surveys, police officers’ post-intervention scores on knowledge tests improved, and officers reported feeling more confident interacting with youth (LaMotte et al., 2010; Sanderson, Kosutic, Griggs, & Anderson, 2008).

Theoretical Foundation

Consistent across Western countries is the finding that criminal behavior peaks during adolescence and declines significantly over time (Farrington, 1986; Hirschi & Gottfredson, 1983). A number of theories have sought to elucidate the mechanisms leading to this finding. For example, the co-development of antisocial behavior and changes in personality have been theorized to lead to this peak of criminal behavior (Blonigen, 2010). Other theories focus on development pathways of antisocial behavior that make distinctions between adolescent-limited and adolescents that continue on to a lifetime of increased criminal behavior (life-course persistent offenders; Moffitt, 1993). Recent neuroscience-based research has also provided an understanding of adolescent criminal behavior. The dual systems model of adolescent risk-taking theorizes that adolescent’s socioemotional system develops prior to the maturation of cognitive control systems (Casey, Jones, & Somerville, 2011; Steinberg, 2010). This, then, leads to an increase in risk-taking activities, including offending behavior, in adolescence that decreases over time as the cognitive control systems are more efficiently developed. In the current project, we describe and provide pilot evaluation data on the effectiveness of police officer training specific to adolescent development. The curriculum developed in the current project has been informed by the dual system model of adolescent risk-taking. Below we describe the curriculum.

Policing the Teen Brain

For the current project, we conducted a pilot evaluation of Policing the Teen Brain (PTB), another pre-arrest intervention for police officers. PTB was originally developed by Lisa Thureau, Founder and Director of Strategies for Youth in Cambridge, Massachusetts (Dachille & Thureau, 2013). The

intervention was designed to supplement standard law enforcement training and introduce officers to the unique characteristics and needs of youth. Thureau argues that officers, and others who work with young people, should strive for “developmental competence:” a basic understanding of the neurological and behavioral changes experienced nearly universally by adolescents (Thureau, January 7, 2013). The ultimate program goal of PTB is to reduce adolescent arrest rates by increasing trust and improving interactions between police officers and youth in the community (Bostic, Thureau, Potter, & Drury, 2014).

PTB training assumes that law enforcement officers often view typical adolescent behavior as disruptive and deliberately defiant, characteristics that may appear threatening to an officer (see (Brown et al., 2009) for discussion). PTB training sessions are designed to temper and contextualize participant views of youth by using neurodevelopmental research to explain expected differences between adolescents and adults. For example, the training highlights the differences between youth and adult cognitions, including that youth cognitions are more likely than adults’ to be “hot” (i.e., characterized by heightened arousal and increased reactivity). The PTB curriculum further emphasizes the tendency of adolescents to assert their autonomy and rely heavily on relationships with peers over parents for support. Portions of the training are focused on environmental factors that commonly affect youth and their behavior, such as neighborhood demographics and cultural messaging. PTB participants also learn firsthand from youth the implications of asserting their authority; justice-involved youth, and other youth from local communities, are invited to work with PTB participants during training sessions; these youths assist with role-play exercises in which they share their perception of officers’ responses. The exercises are meant to reinforce that adolescents perceive, process, and respond to social and contextual cues differently than adults. PTB participants are then taught skills and techniques to respond to youth in a manner that recognizes but redirects behavior that is typical of a teen. PTB attendees are similarly taught to identify compromised adolescent behavior that may indicate mental health problems, substance use, trauma, or some combination of these. Lastly, police officers are provided ways to de-escalate emotionally heated or aggressive encounters with youth to minimize violence and, ultimately, reduce arrests.

PTB has been adopted by many jurisdictions across the country including urban, suburban and rural jurisdictions. In Boston, where PTB was first implemented with the Massachusetts Bay Transit Authority Police, rates of juvenile arrests have steadily declined post-training (Bostic et al., 2014). However, PTB has not yet been formally evaluated. Here, we provide results of a pilot study to determine whether, compared to pre-training measures, PTB attendees report improved attitudes toward adolescents and increased knowledge of de-escalation skills. A secondary goal of the study was to determine whether participants report increased amenability to training justice system personnel to interact with youth.

Methods

In Indiana, PTB was implemented within the context of a national juvenile justice system reform effort: the Annie E. Casey Foundation “Juvenile Detention Alternatives Initiative (JDAI).” JDAI diverts arrested, low-risk youth from pre-adjudication detention (Mendel, 2014). JDAI sites are located in more than 250 counties nationwide (Mendel, 2014) and in 19 Indiana counties thus far. Each of the 19 counties contains a juvenile detention center and, in total, JDAI counties receive nearly 70% of the Indiana’s juvenile justice system referrals (*2014 Indiana Probation Report: Summary and Statistics*, 2015). PTB is similarly being introduced in jurisdictions across the country (Bostic et al., 2014). To date, PTB has been piloted in nine of Indiana’s JDAI counties, providing an important complement to JDAI’s post-arrest intervention efforts. For the current project, we analyzed data from two of these Indiana counties, the only counties in which data from several PTB training sessions were available.

In Indiana, attending PTB training is voluntary, though leaders in local police and sheriff departments encourage police officers and other juvenile justice system personnel to attend these supplementary trainings. That staff with varied job descriptions are invited to PTB trainings, rather than law enforcement only, is by design. By including those who work closely with justice-involved youth in different roles, PTB trainings provide an opportunity for local practitioners to share information and communicate about the practical importance of training topics across systems. We included 2 jurisdictions in the current project. Both jurisdictions partnered with SFY for access to technical support and to provide on-site train-the-trainer support. Each jurisdiction had support from local law enforcement, local JDAI as

well as the Indiana state-wide JDAI. Funds for training were made available through the Indiana state-wide JDAI effort. An initial 4-day train-the-trainer model occurred with subsequent technical support from SFY. Thereafter, PTB trainings in Indiana are offered as two-day sessions comprised of multiple modules led by experts in adolescent health and juvenile delinquency law. The first day of training is conducted by a mental health expert and focuses first on normative adolescent development. Other modules on the first day cover trauma and behavioral health issues common to justice-involved youth. The second day's modules are taught by local police officers who have been trained to conduct PTB modules about local adolescent demographics, how to effectively assert authority to minimize use of physical force, and adolescent-specific law and policy. Lastly, local teens conduct several role play scenarios with officers.

A pre-post study design was used to conduct a preliminary evaluation of PTB. Both immediately before and after PTB training sessions, attendees were given paper-based surveys, which required approximately 10-15 minutes to complete. PTB attendees were informed that completing the surveys was voluntary and that their responses would be kept confidential, particularly from their employers. This study was approved and deemed exempt by the Indiana University-Purdue University, Indianapolis Institutional Review Board.

Sample

A total of 232 participants attended one of ten training sessions conducted between April 1, 2015, and September 20, 2016. Attendance at each training session ranged from 16-30 participants, over half of whom ($n = 148$, 63.8%) were self-described law enforcement officers (e.g., police officer, patrolman, deputy sheriff, school resource officer, detective). Remaining participants included other juvenile justice system personnel, including probation officers, corrections officers, and the like. The majority of study participants identified themselves as male (77.6%) and White (93.5%; 4.3% Black; <3% other race/ethnicity or unknown). In response to a question about the highest level of education achieved, 46.1% of participants reported having at least a bachelor's degree. The majority of the sample (70.7%) had been employed with the justice system for less than 10 years. More than half of participants (53.4%)

had never before received training about adolescent development or how to interact accordingly with youth. See Table 1 for detailed sample characteristics.

[Insert Table 1]

Of the 232 attendees, 207 (89.2%) completed both pre- and post-training surveys regarding participant attitudes toward adolescents; 3.9% of the sample were missing pre-tests, and 6.9% were missing post-tests. Comparing those who completed both surveys with participants who completed one survey (i.e., either a pre- or a post-training survey), suggests that the participant groups did not differ significantly with regard to their employment as a law enforcement officer ($X^2(1) = .32, p = .845$), gender ($X^2(1) = .06, p = .806$), race (white vs. non-white; $X^2(1) = 1.74, p = .19$), level of education completed ($X^2(9) = 3.81, p = .924$), years employed in the juvenile justice system ($X^2(3) = .116, p = .116$), or whether they had received previous training about interacting with adolescents ($X^2(1) = .80, p = .370$). Given the rate of missing survey responses (10.8%), we imputed data to increase the analyzable sample size. Missing pre-test scores were imputed with sample means. Missing post-test scores were imputed using last observation carried forward (LOCF), a conservative approach that assumed no change between pre- and post-intervention attitudes.

Survey Measures

In addition to questions about participant demographic information and training experience, the surveys consisted largely of items related to participant attitudes and knowledge. Participants were asked to express their agreement with stated attitudes on a 7-point Likert scale, with higher scores indicating more agreement. Survey subscales regarding youth asked about participant attitudes toward 1) adolescents generally, 2) adolescence as a stressful developmental stage, and 3) punishment of youth involved in the juvenile justice system.

Positive adolescent attitudes. Seven survey items asked participants about their attitudes toward adolescents and their comfort and confidence interacting with youth ($\alpha = .77$). Subscale items were based on those used in a previous evaluation of the Connecticut-based police officer training program to reduce disproportionate arrests of minority youth, “Effective Police Interactions with Youth” (Sanderson et al.,

2008). Example subscale items included, “Young people are positive assets to my community;” “I have the skills necessary for interacting effectively with youth;” and “[Justice system personnel] can have a positive impact on youth without taking time away from their enforcement activities.” Higher subscale scores indicated more positive attitudes toward adolescents and interacting with them.

Negative adolescent attitudes. Nine survey items comprised a subscale related to attitudes about adolescence as a time of “storm and stress,” derived originally from Hill’s framework for the study of adolescence (see (Holmbeck & Hill, 1988) for nine-item scale as it appears in the current study). This subscale measured the extent to which participants agreed with statements characterizing youth as emotionally volatile, rebellious, and generally in conflict with authority. Example items included, “Adolescents do not cooperate with their parents,” and “Adolescents have identity crises.” Higher subscale scores indicated endorsement of attitudes about youth that align with stereotypical characterizations of youth. The internal consistency of pre-test responses on subscale items fell below an acceptable level ($\alpha = .64$), but was improved by the removal of one subscale item - “Adolescents are more influenced by parents than peers”. The resulting eight-item subscale scores ($\alpha = .71$) were included in all subsequent analyses.

Punishment attitudes. This subscale was comprised of six statements about the role of the juvenile justice system to punish youth in the system ($\alpha = .85$). The subscale was derived from a study exploring predictors of attitude differences among juvenile justice system personnel (Leiber, Schwarze, Mack, & Farnworth, 2002). Example items included, “It is important for the juvenile justice system to achieve the goal of punishment,” and “Delinquents should be prosecuted to the full extent of the law.” Higher scores on this subscale indicated more punitive attitudes.

Training attitudes. Participants were also asked about their attitudes toward the value of trainings for police officers and other justice system personnel (e.g., “Training police officers how to interact with youth is just one more fad in policing that will soon be replaced with another fad.”). The four-item scale ($\alpha = .76$) was adapted slightly from a measure of police officer responses to the CIT program (Schaefer

Morabito, Watson, & Draine, 2013). Higher scores indicated agreement that trainings for justice system personnel are worthwhile.

De-escalation skills. Finally, multiple-choice survey items asked about participant knowledge of basic de-escalation techniques (e.g., “Letting youth ‘vent’ in non-dangerous situations involves all of the following except:”). The four-item scale was used in an evaluation of “Effective Police Interactions with Youth.” Scores on the knowledge scale reflected the sum of correct responses.

Analysis

Mean response scores were calculated for each subscale measure of participant attitudes regarding: adolescents generally, adolescence as a stressful developmental stage, punishing youth in the juvenile justice system, and the value of training justice system personnel. Each participant also received a total score representing their knowledge of de-escalation skills. Paired sample t-tests were used to detect whether participant attitudes and knowledge differed significantly post-PTB. We then used hierarchical regression analysis to identify the participant characteristics and attitudes significantly associated with improved knowledge of de-escalation skills post-PTB.

Results

Results indicated significant differences between mean pre- and post-survey responses on nearly all survey subscales. Compared to pre-training responses ($M = 5.82$), PTB attendees were more likely to endorse positive attitudes toward interacting with adolescents post-training ($M = 6.07$; $t(231) = -4.12$, $p < .001$). Participants also reported post-training attitudes that were less punitive toward youth ($t(231) = 7.27$, $p < .001$) and less negative regarding training justice system personnel about adolescents ($t(231) = 3.19$, $p = .001$), when compared to their pre-training responses. There was no significant difference between participants’ pre- and post-training endorsement of the belief that adolescence is a stressful time. Lastly, participants’ scores on the test of their knowledge about de-escalation skills also improved ($t(231) = -2.89$, $p = .004$). See Table 2 for results of all paired sample t-tests.

[Insert Table 2]

The final regression model significantly predicted improvement in officer knowledge scores between pre- and post-PTB training responses. See Table 3. Step 1 of the model included participants' pre-training knowledge of de-escalation skills. Participant characteristics were entered into Step 2 and included: participant status as a police officer (vs. other justice system personnel), gender, length of employment in the justice system, highest level of education achieved, and whether the participant had any previous training about adolescents. Note that analyses did not account for participant race/ethnicity due to limited diversity within the sample. All pre-training measures of participant attitudes were entered into Step 3. In the final model, among pre-training survey measures, only officers' pre-training positive attitudes toward interacting with youth were significantly predictive of post-training improvements in de-escalation skill knowledge [$\beta=0.16$; 95% CI (0.03,0.34); $p=.013$]. Among participant characteristics, participant gender and level of education contributed to the observed variation in post-training knowledge of de-escalation scores; female participants and those who reported higher levels of education were more likely than other participants to show improvement in their knowledge of de-escalation techniques. Note that participant job description (i.e., police officers vs. other justice system personnel) did not significantly contribute to differences in knowledge gains. See Table 3 for a summary of model results.

[Insert Table 3]

Discussion

Study results indicate that, compared to participants' pre-training survey responses, participation in PTB is associated with significantly improved attitudes toward youth and increased knowledge of basic skills to de-escalate future encounters with adolescents. After just a few short days of training, the justice system personnel who attended PTB specifically reported improved attitudes toward interacting with adolescents and expressed less punitive attitudes regarding youth in the juvenile justice system. Few other studies have described police officers' general attitudes toward youth, more often couching discussions of problematic police-youth interactions within the context of adolescents' attitudes toward legal authority generally and toward police officers specifically. In light of links between attitudes and behavior, and the necessarily reciprocal nature of police-youth interactions, it stands to reason that justice system personnel

who make positive attributions about youth would likely treat adolescents with greater degrees of understanding and respect than those who view adolescents negatively. Relatedly, participants in the current study who reported more positive attitudes toward youth pre-PTB were also more likely to show an increased understanding of de-escalation skills post-training. PTB may, in this way, contribute to less antagonistic relationships between youth and law enforcement. Post-training, PTB participants were also more likely to endorse statements about the importance of teaching justice system personnel about typical adolescent development and behavior. As in previous evaluations of pre-arrest interventions for police (Goodrich et al., 2014; LaMotte et al., 2010), the promising findings of the current study bode well for engaging future cohorts of justice system personnel in PTB training.

PTB training sessions are designed to impart information about typical adolescent neurodevelopment and behavior, recognizing youth tendencies toward impulsivity and heightened emotionality. Importantly, compared to pre-training scores, study participants demonstrated improvement in their knowledge of de-escalation techniques that could be applied during volatile interactions with youth. Standard trainings for law enforcement officers do not usually include material specific to the unique nature of adolescence; indeed, fewer than half of study respondents – all justice system personnel – reported having received any training specific to adolescent needs. It follows that law enforcement officers may be ill-prepared to respond in a calming way to adolescents' naturally escalated emotions. Intense media attention on the interactions between youth and police further suggests the timeliness of interventions like PTB to improve police-youth encounters. Tragedies between officers and adolescents - such as the police shootings of unarmed, young Black men and teens in Ferguson, Missouri; Cleveland, Ohio; Austin, Texas; Columbus, Ohio; and others - have received intense community scrutiny (see (Ly & Hanna, 2014) for example). Indeed, scholars and public opinion alike have called for examination and reform of police officer training, (Danylko, 2014) clearly evidenced by mandatory de-escalation or “force-mitigation” trainings in major metropolitan areas like Chicago (Sweeney, 2016), Dallas (Cohen, 2016), and Los Angeles (Wilkins, 2016). That PTB participants in Indiana showed improved knowledge of de-escalation techniques after a short training session is particularly encouraging.

Limitations and Conclusions

The nature of the current evaluation of PTB suggests it is only a starting point for determining the value of teaching police officers, and other justice system personnel, how to interact effectively with adolescents and decrease the chances that their interactions with youth in the community will become violent. According to a popular training evaluation outcomes model by Kirkpatrick and Kirkpatrick (2006), PTB and similar programs can be assessed on several additional levels, including participant skills demonstration and youth outcomes. The limitations of the current study suggest specific avenues for continued research and future tests of PTB. When designing the study survey, for example, we found few validated measures of knowledge, attitudes, and beliefs that related specifically to police officers or other justice system personnel working with adolescents. We incorporated survey measures of past officer training evaluations whenever possible to improve comparisons across studies, but little information about the psychometric properties of the survey measures was available. Nor did the study design capture whether the improved attitudes and knowledge of PTB participants would be sustained over time. Given the short two-day training, it is possible that testing effects may account for some of the improvements from pre- to post-surveys. We argue that assessing the true value and long-term policy implications of PTB and similar law enforcement trainings will require more sophisticated and tested measures of officer knowledge and attitudes at multiple time points. Similarly, developing more comprehensive and practical measures of de-escalation skills is imperative.

As in other studies of pre-arrest police officer training interventions (Campbell, 2012; Goodrich et al., 2014; LaMotte et al., 2010), our pilot evaluation of PTB did not test the effects of the training on actual behavioral change, such as rates of juvenile arrest by police participants or in vivo demonstration of de-escalation skills during actual or simulated post-training interactions with youth. Related challenges to consider echo general concerns about the utility of simulation training for police officers; the situations police officers face day-to-day vary significantly but are often emotionally charged and potentially dangerous, requiring immediate decision making and action. Recreating this type of pressure on training participants to capture their true understanding of de-escalation techniques is difficult, especially when

time and resource constraints allow for little more than survey assessment. Again, the limitations of the pilot findings reported here can guide further in-depth exploration of the effects of PTB on both law enforcement attitudes and behavior change over time. Given promising preliminary findings that PTB is associated with improvements in officers' attitudes and knowledge, future full-scale studies of PTB are warranted.

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Table 1. Sample characteristics (N = 232)

	n (%)
Gender	
Male	180 (77.6)
Female	51 (22.0)
Race/Ethnicity	
White	217 (93.5)
Black	10 (4.3)
Other race/ethnicity	4 (1.7)
Highest level of education achieved	
High school diploma/GED	14 (6.0)
Associate's degree/some college	84 (36.2)
Bachelor's degree	107 (46.1)
Any post-graduate	25 (11.2)
Years employed in the justice system	
0 - 3	112 (48.3)
3.1 - 6	21 (9.1)
6.1 - 10	31 (13.4)
> 10	68 (29.3)
Employed as a police officer	
Yes, police officer	148 (63.8)
No, other justice system personnel	83 (35.8)
Previously attended training regarding adolescents	
Yes	96 (41.4)
No	124 (53.4)
No response	12 (5.2)

Table 2. Differences in justice system personnel scores on pre-post Policing the Teen Brain training survey subscales (N=232)

Subscales	PRE	POST	<i>t</i>	<i>p</i>
	<i>M (SD)</i>	<i>M (SD)</i>		
Adolescents attitudes (1 = strongly disagree, 7 = strongly agree)				
Positive	5.82 (.72)	6.07 (.85)	-4.12***	.000
Negative	4.91 (.60)	4.98 (.68)	-1.49	.138
Punishment	4.41 (1.00)	4.00 (1.03)	7.27***	.000
Training attitudes (1 = strongly disagree, 7 = strongly agree)				
	2.55 (.99)	2.35 (1.09)	3.43**	.001
De-escalation skills (range = 0-4)				
	2.54 (1.03)	2.72 (.99)	-2.94**	.004

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 3. Summary of a hierarchical linear regression model predicting improvement in knowledge of de-escalation skills

	R^2	β^a	t	p
Step 1: Pre-training score: De-escalation skills	.238***			
		-.531***	-8.800	.000
Step 2: Participant characteristics	.273***			
Police officer (0 = no, 1 = yes)		-.134	-1.843	.067
Gender (0 = female, 1 = male)		-.165*	-2.289	.023
Highest level of education		.181**	2.863	.005
Years employed in JJ system		.076	1.255	.211
Previous training about adolescents (0 = no, 1 = yes)		-.123	-1.928	.055
Step 3: Pre-training scores	.290***			
Positive attitudes		.160*	2.507	.013
Negative attitudes		.024	.393	.695
Punishment attitudes		-.064	-.945	.346
Training attitudes		-.001	-.016	.988

* $p < .05$, ** $p < .01$, *** $p < .001$

^a Final betas shown.

^b JJ = juvenile justice