An Evaluation of the Kentucky Department of Criminal Justice Training's Sexual Assault Investigations Course: Results from a Randomized Experiment

A Report to the SAFE Kit Backlog Research Working Group

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PROJECT OVERVIEW[1]

In 2017, the Kentucky Office of the Attorney General, Office of Victims Advocacy provided funding for the Kentucky SAFE Kit Backlog Research Project to examine the problem of unsubmitted sexual assault forensic examination (SAFE) kits that were collected but never submitted to a crime lab for analysis. This project was extended in 2018 through the KY OAG's Sexual Assault Kit Initiative Grant. The SAFE Kit Backlog Research Project seeks to provide a holistic research approach to examine this problem by providing data-driven insights into the response to these problems in the Commonwealth of Kentucky. The research team is collecting data to understand the factors that contributed to the number of unsubmitted SAFE kits, the characteristics associated with SAFE kits, kit submission rates throughout the Commonwealth, as well as testing results and case outcomes. Additionally, the project is evaluating the impact of efforts by the Sexual Assault Response Team Advisory Committee (SART-AC) and the DANY Grant Sexual Assault Forensic Evidence Taskforce, as well as the impact of Kentucky's SAFE Act – passed in 2016 through Senate Bill 63 – on responses to sexual assault in Kentucky.

The SAFE Kit Backlog Research Working Group is comprised of members from the following groups:

- Kentucky Office of the Attorney General's Office of Victims Advocacy
- Kentucky Office of the Attorney General's Department of Criminal Investigations
- Kentucky State Police Crime Laboratory
- Kentucky State Police
- Kentucky Department of Criminal Justice Training
- Kentucky Association of Sexual Assault Programs
- Kentucky Sexual Assault Response Team Advisory Committee
- Louisville Metro Police Department
- Lexington Police Department
- State, Local, and County Law Enforcement Agencies
- University of Louisville – Department of Criminal Justice
- University of Louisville – Southern Police Institute

The research team has been working with these organizations collaboratively to collect data that will contribute to an understanding of the statewide response to sexual assaults. These organizations have implemented several reforms to address the volume of unsubmitted SAFE kits and to improve the response to sexual assaults in Kentucky. The research portion of this project employs an action research approach, which will allow the research to inform responses. This is one of several reports that will evaluate Kentucky's response to sexual assault.

[1] This project was supported by Grant No. 2017-AK-BX-009 awarded by the Bureau of Justice Assistance. The Bureau of Justice Assistance is a component of the Department of Justice's Office of Justice Programs, which also includes the Bureau of Justice Statistics, the National Institute of Justice, the Office of Juvenile Justice and Delinquency Prevention, the Office for Victims of Crime, and the SMART Office. Points of view or opinions in this document are those of the author and do not necessarily represent the official position or policies of the U.S. Department of Justice.

BACKGROUND

In 2016, the Kentucky Legislature passed the SAFE Act, in response to the problem of untested SAFE kit backlogs after a 2015 audit identified more than 3,000 untested SAFE kits in jurisdictions throughout Kentucky. A portion of the SAFE Act required that beginning January 1, 2017 at least one officer from every Kentucky law enforcement agency must attend training focused on victim-centered sexual assault investigations.[2] In response, the KY DOCJT developed the Sexual Assault Investigations course. The course is a comprehensive 40-hour program, covering several topics, ranging from KY sexual assault laws, victim-centered responses to survivors of sexual assault (e.g., neurobiology of trauma, sexual assault response teams, victim interviewing), the role of forensic evidence (e.g., sexual assault kits) in investigations, and common misconceptions about victims of sexual assault. Because this training requirement was new, the KY DOCJT added an evaluation component to assess the training program's effectiveness. As such, the research team completed a randomized experimental evaluation to assess the short- and long-term impact of the KY DOCJT training on three outcome variables: (1) rape myth acceptance, (2) Kentucky sexual assault laws, and (3) knowledge of trauma-informed practices. To accomplish this goal, we used data collected from a randomized survey design to answer the following research questions:

- *RQ1: What are the short and long-term effects of the KY DOCJT training on police officers' self-reported levels of rape myth acceptance?*
- *RQ2: What are the short and long-term effects of the KY DOCJT training on police officers' knowledge of Kentucky sexual assault laws?*
- *RQ3: What are the short and long-term effects of the KY DOCJT training on police officers' knowledge of trauma informed practices?*

Analysis of both short- and long-term effects indicated that the training was effective in reducing rape myth acceptance, improving knowledge of laws, and increasing officer knowledge of trauma informed practices. The following report discusses the KY DOCJT training and its impact on officers' knowledge and perceptions of victims.

[2] Specifically, Kentucky Revised Statute 15.334(c) mandated that agencies with less than five officers send at least one officer to the training, agencies with five to 29 officers send at least two officers, and agencies with 30 or more officers send at least four officers to the training.

ACKNOWLEDGEMENTS

Several partners assisted in the collection of data analyzed in this report. We would like to specifically thank some of these partners from the Kentucky Department of Criminal Justice Training for their assistance with this portion of the project. First, we thank John Schwartz and Frank Kubala for their feedback and revisions on drafts of the survey, and for approving this evaluation of the DOCJT Sexual Assault Investigation Training course. Second, we also thank Gretchen Hunt and Eileen Recktenwald for their input on early drafts of our survey. Third, we thank Training Instructor James Root who developed the DOCJT Sexual Assault Investigation Training course and taught all of the courses included in this study. Instructor Root allowed the research team to attend each training session and carved valuable time out of a packed curriculum for survey administration. Thank you, Instructor Root, for your patience, hard work, and insights throughout this project – we could not have done this without you. Finally, thank you to all of the participants in this study. Your participation in this study was critical to informing future trainings and other jurisdictions who seek to implement similar programs.

Literature Review

In the past 30 years, advocacy and law enforcement professionals have aimed to improve responses to survivors of sexual assault through training programs focused on trauma-informed investigative practices (R. Campbell, 2012; EVAWI, 2016; Vito et al., 1983/1984). The goal of this training is to inform police officers about neurobiological responses to trauma, myths about rape victims, and effective responses to survivors that can reduce revictimization. This type of training is widely available online via training briefs and webinars (see EVAWI, IACP), however, few jurisdictions have implemented and evaluated mandatory sexual assault training programs for law enforcement officers. Indeed, a recent review of the academic literature dating back to 2001 revealed seven studies that examined the impact of sexual assault training programs (Sleath & Bull, 2017). Of these studies, two evaluated training using US samples of police officers (Lonsway et al., 2001; Rich & Seffrin, 2012). Findings from these few studies are mixed. Some find that training is effective at improving officers' views of victims in hypothetical sexual assault investigations (Rich & Seffrin, 2012; Lonsway et al., 2001), while others have found that training has no impact of perceptions of victims (Sleath & Bull, 2012).

These mixed findings could be caused by several methodological differences across studies. For example, the length of training programs varies significantly, ranging from 3.5 hours of training offered through three training modules (Lonsway et al., 2001), to 98-hours of instruction completed over four consecutive weeks (Darwinkel et al., 2013). Additionally, some of these studies did not use randomized experimental designs, which limits the ability to isolate the effects of training on outcomes of interest. The limited body of literature and these methodological differences can be problematic as states[3] begin to adopt legislation mandating sexual assault investigation training for police officers. To build on prior evaluations and add to the knowledge base regarding the effectiveness of training, the University of Louisville's Department of Criminal Justice and the KY Sexual Assault Kit Initiative (KY SAKI) team partnered with the KY DOCJT to conduct a randomized evaluation of the KY DOCJT training. Through this study, we sought to answer three primary research questions:

RQ1: What are the short and long-term effects of the KY DOCJT training on police officers' self-reported levels of rape myth acceptance?

RQ2: What are the short and long-term effects of the KY DOCJT training on police officers' knowledge of Kentucky sexual assault laws?

[3] See Illinois Sexual Assault Incident Procedure Act of 2016 and Kentucky SAFE act of 2016.

RQ3: What are the short and long-term effects of the KY DOCJT training on police officers' knowledge of trauma informed practices?

The KY DOCJT Sexual Assault Investigations Course

As mandated by the SAFE Act, the KY DOCJT developed a 40-hour course to train officers on victim-centered response to sexual assault survivors. **Table 1** below details the SAFE Act requirement regarding the number of officers sent by each agency to the training course. **Table 2** below lists the course training topics covered by the KY DOCJT sexual assault training course.

Table 1. Sexual assault reform in Kentucky

- SAFE Act (or KRS 15.384)
  - Beginning 01/01/2017 mandatory training for all law enforcement agencies
- KY DOCJT's 40-hour sexual assault investigations training course
  - At least 1 officer in every KY agency
  - Agencies with 4 or fewer officers = 1 officer trained
  - Agencies with 5-29 officers = 2 officers trained
  - Agencies with 30 or more officers = 4 officers trained

Table 2. KY DOCJT sexual assault investigations training course: Topics covered

1. Kentucky laws	6. Investigative strategy	10. Offender dynamics
2. Rape myths	7. Special communities	11. Preliminary investigation
3. Victim impact	8. DNA evidence	12. Victim interview
4. Model LE response	9. Forensic examination	13. Unfounded cases
5. SART response		

Study Participants and Design

Study participants included officers sent by their police department to attend one of eleven KY DOCJT sexual assault training courses offered between May 2017 and April 2018. Of the 396 officers who attended these training courses, 364 completed surveys (92% response rate). To evaluate the impact of the training, we used a randomized three-group design, which allowed us to ensure that any changes in the three outcome variables – (1) rape myth acceptance, (2) knowledge of Kentucky laws, and (3) knowledge of trauma informed practices – were caused by the KY DOCJT training and not an undetected cause and/or survey questions that primed officers to respond in a certain way. Following this design, each of the eleven KY DOCJT sexual assault courses were randomly assigned to three groups: (1) Group A – pre- and post-training assessment (n=144), (2) Group B – post-training only assessment (n=106), and (3) Group C – pre-training only assessment (n=114). Through this design, we created two treatment groups –

Groups A and B – of officers who had completed the KY DOCJT sexual assault training and one control group – Group C – of officers who had not completed the sexual assault training course. **Table 3** displays the study design and the schedule of survey assessments.

Table 3. Randomized three-group design and schedule of assessments (N=364)

	Treatment Groups		Control Group
	Group A (n=144)	Group B (n=106)	Group C (n=114)
Pre-test assessment	X	–	X
KYDOCJT training	X	X	X
Post-test assessment	X	X	–
Follow-up assessment	X	X	–

Outcome Measures

Using this design, we were able to assess the effect of training on three outcome variables including: (1) officers' self-reported rape myth acceptance, (2) knowledge of Kentucky laws, and (3) knowledge of trauma-informed practices. The following results are derived from our comparisons of Group A's pre- and post-test scores, and a comparison of Group B's post-test scores with Group C's pre-test scores. In this report we present only descriptive findings and statistical significance testing to assess whether any changes in the dependent variable are statistically significant. A full multivariate statistical analysis is available in **Appendix A**, along with a list of measures used to create each outcome variable (e.g., rape myth acceptance, knowledge of Kentucky laws, and knowledge of trauma informed practice).

Results

Findings for the descriptive analysis are displayed in **Tables 4 – 6** and **Figures 1 – 3**. For each of the three outcome variables, we averaged officers' responses into one score representing their self-reported levels of rape myth acceptance, knowledge of Kentucky laws, and knowledge of trauma informed practices. Our short-term results illustrating the impact of the KY DOCT training on each of these outcome variables are discussed below, followed by a summary of our long-term follow-up assessment.

Short-Term Effects of Training

Rape Myth Acceptance. We measured rape myth acceptance using an average of officers' responses to 17 questions derived from the Illinois Rape Myth Acceptance – Short

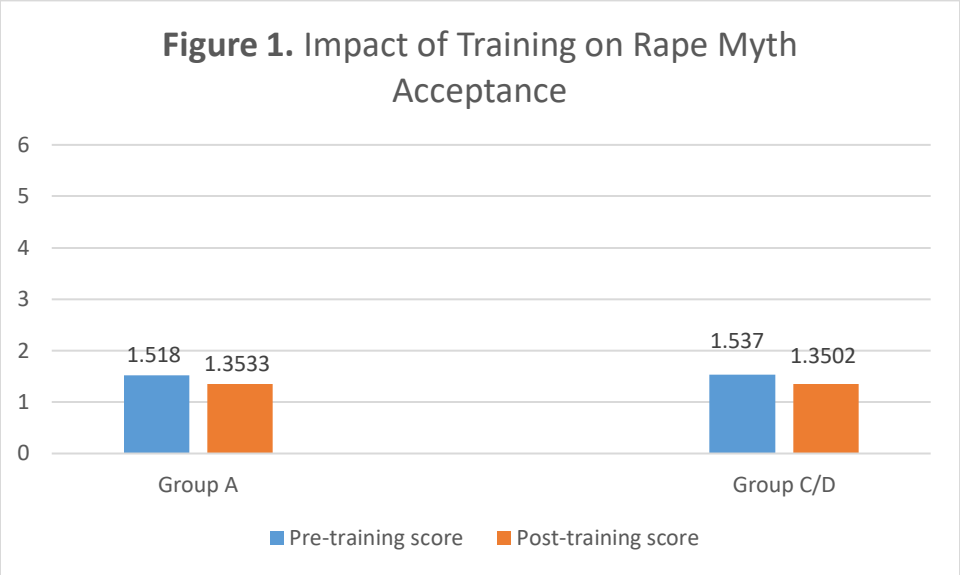
Form Scale (IRMA-SF) (See **Appendix A** for a list of questions included in this scale). Based on the IRMA-SF, *lower average scores indicate a lower level of rape myth acceptance*. As shown in **Table 4**, and **Figure 1**, a comparison of Group A's pre-training and post-training scores indicated a 10.9% reduction in rape myth acceptance. A statistical significance test revealed that this reduction was significant, and that training produced a large effect on rape myth acceptance[4]. These results are supported by the comparison of Groups B and C, which produced a 12.1% reduction in average rape myth acceptance. Statistical significance testing indicated that this 12.1% difference was significant, and that training had a medium effect on rape myth acceptance when comparing Group C's pre-training scores with Group B's post-training scores.

Table 4. Impact of Training on Rape Myth Acceptance

Group	Test type	Average difference	t-score	Significance (95%)	Effect size *d*
A (pre/post-test w/ DOCJT SA) (n=144)	Paired samples t-test	.1646 (-10.9%)	5.053	*	.8422[1]
C versus B (pre-test only versus post-test only) (n=114/n=106)	Independent samples t-test	.1864 (-12.1%)	3.370	*	.4598[2]

[1] Cohen's *d* standardized mean difference (t-test, equal sample sizes)
[2] Cohen's *d* standardized mean difference (t-test unequal sample sizes)
*$p < .05$

[4] The magnitude of these relationships are calculated using Cohen's *d* formula for assessing effect size. To calculate Cohen's *d*, or standardized mean difference effect sizes for each of our analyses, we used Wilson's Practical Meta-Analysis Effect Size Calculator (found here https://campbellcollaboration.org/effect-size-calculato.html). Based on Cohen's (1992) recommendations for interpreting the magnitude of *d*, 0.2 is interpreted as a small effect, 0.5 is considered a medium effect, and 0.8 is interpreted as a large effect.



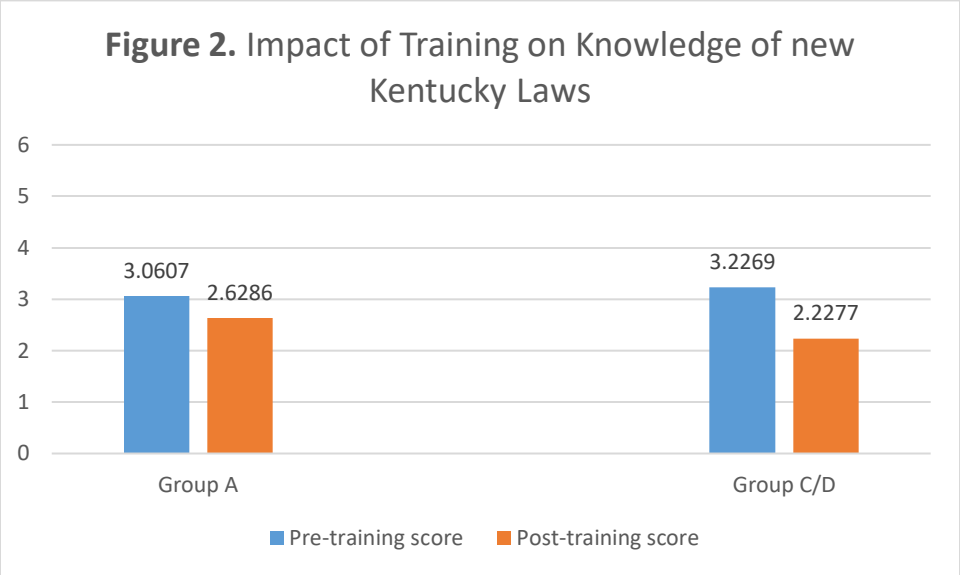
Knowledge of new Kentucky Laws

Knowledge of Kentucky laws was measured using officers' responses to two questions that assessed officers' understanding of new laws implemented in Kentucky in 2017. These questions are displayed in **Appendix A**. Based on the knowledge of Kentucky law scale, *lower average scores represent a higher level of knowledge of Kentucky laws*. As shown in **Table 5** and **Figure 2**, when comparing Group A's pre-training scores and post-training scores, we see a significant increase in officers' knowledge, represented by a 14.1% improvement in knowledge. Group A's improvement in knowledge was statistically significant producing a medium effect size. Similarly, when comparing Group C's knowledge scores with Group B, our analysis detected a significant improvement in knowledge (30.9%), representing a medium effect of training on officers' knowledge of Kentucky law.

Table 5. Impact of Training on Knowledge of new Kentucky Laws

Group	Test type	Average difference	t-score	Significance (95%)	Effect size *d*
A (pre/post-test w/ DOCJT SA) (n=144)	Paired samples t-test	.4321 (-14.1%)	2.459	*	.4098[1]
C versus B (pre-test only versus post-test only) (n=114/n=106)	Independent samples t-test	.9992 (-30.9%)	5.106	*	.6889[2]

[1] Cohen's *d* standardized mean difference (t-test, equal sample sizes)
[2] Cohen's *d* standardized mean difference (t-test unequal sample sizes)
*$p < .05$



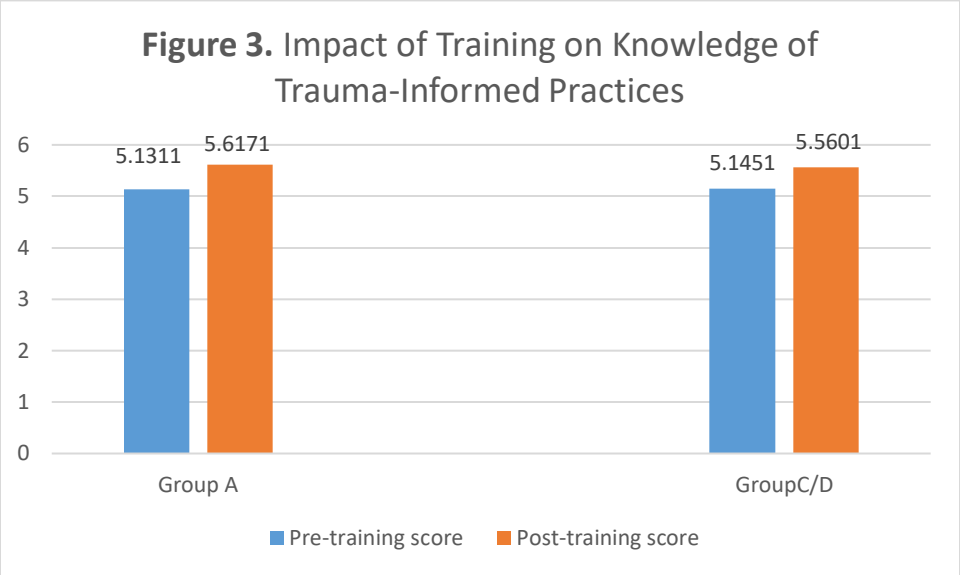
Knowledge of Trauma Informed Practices

Finally, we measured officers' knowledge of trauma informed practices using four questions that are displayed in **Appendix A**. For our knowledge of trauma informed practices scale, *higher scores represent more knowledge*. As shown in **Table 6** and **Figure 3**, training significantly improved officers' knowledge of trauma informed practices in Group A by 9.5%, demonstrating that training had a large effect on officers' knowledge of trauma informed practice. When comparing Group C with Group B, results also detected a significant increase in knowledge (8.1%), representing a medium effect size.

Table 6. Impact of Training on Knowledge of Trauma Informed Practices

Group	Test type	Average difference	t-score	Significance (95%)	Effect size *d*
A (pre/post-test w/ DOCJT SA) (n=144)	Paired samples t-test	.486 (9.5%)	-7.432	*	1.2387[1]
C versus B (pre-test only versus post-test only) (n=114/n=106)	Independent samples t-test	.415 (8.1%)	-3.651	*	.4926[2]

[1] Cohen's *d* standardized mean difference (t-test, equal sample sizes)
[2] Cohen's *d* standardized mean difference (t-test unequal sample sizes)
*$p < .05$



In sum, the analysis of immediate training effects indicated that the KY DOCJT training was effective at (a) reducing short-term rape myth acceptance, (b) increasing short-term knowledge of Kentucky sexual assault laws, and (c) increasing short-term knowledge of trauma informed practices. Additionally, we ran multivariate models to further assess the effects of training (see **Appendix A**), and findings mirrored our descriptive results presented above.

Long-Term Effects of Training

While the training was effective in producing short-term effects, we also sought to assess the long-term impact of the KY DOCJT sexual assault training program on our outcome variables. To achieve this goal, we emailed follow up surveys to the 250 officers who were assigned to Groups A and B in August and September of 2018. Of these 250 officers, 71 returned surveys after three waves of emails (28% response rate). On average, 361 days had passed between participants' first post-training survey and the follow-up survey, with a minimum of 246 days and a maximum of 466 days. Using this follow-up survey, we compared officers' average scores for each of our outcome scales (e.g., rape myth acceptance, knowledge of new Kentucky laws, knowledge of trauma informed practices) with their immediate post-training scores. As shown in **Table 7**, results indicated that the effects of training held up over time. Specifically, average scores did not significantly differ when comparing post-training and longer term follow-up assessments for rape myth acceptance and knowledge of trauma-informed practices, while average scores on the knowledge of Kentucky laws scale significantly improved in the follow-up

assessment.[5] As such, these findings indicate that the KY DOCJT training was effective at producing both short- and long-term improvements in officer knowledge and perceptions of victims.

Table 7. Long-Term Effects of the KY DOCJT Training

	Outcome Variable		
Group	Rape Myth Acceptance	Knowledge of new Kentucky Laws	Knowledge of Trauma Informed Practice
Group A	NS	NS	NS
Group B	NS	+	NS

NS = Not Significant
+ = Significant improvement

Recommendations

To summarize, findings from our analysis indicated that the KY DOCJT sexual assault investigations training was effective at improving officers' knowledge and perceptions of victims. As evidenced by our results, the training significantly reduced officers' rape myth acceptance, while increasing knowledge of Kentucky laws and trauma informed practice. Additionally, these results were sustained as demonstrated by our long-term follow-up assessment. While the KY DOCJT training was shown to be effective, the KY DOCJT wished to conduct an assessment of additional training needs identified by training participants. *As such, we surveyed the officers who were assigned to Groups A and B to determine potential topics for additional training*. ***Of these officers, 127 (41.0%) (see Table 8) indicated a desire for more training on interviewing victims of sexual assault. Accordingly, the research team developed methods of training to meet this need for Kentucky police officers***.

[5] Improved scores on the Kentucky laws scale may have improved because officers who investigated crimes during the follow-up period may have familiarized themselves with the new laws implemented by SB63.

Table 8. DOCJT training all requests for continued training

Variables	N	%[a]
Topics		
1. Interviewing perpetrators	155	50.0
2. Interviewing victims	127	41.0
3. Crime scene investigation/forensic evidence	125	40.3
4. Report writing/case presentation	77	24.8
5. Investigating cold cases	76	24.5
6. Defeating consent defenses	74	24.2
7. Sexual assault laws	57	18.4
8. Preventing sexual violence	43	13.9
9. Alcohol/drug facilitated sexual assault	41	13.2
10. Dynamics of sexual assault	33	10.7
11. Multidisciplinary/coordinated response to SA	25	8.0
12. Medical/forensic examination of victims	24	7.7
13. Trauma informed response to victims	22	7.1
14. Medical/forensic examination of perpetrators	17	5.5
15. Non-stranger sexual assault	13	4.2
16. Intimate partner/marital sexual assault	11	3.6
17. Data/incidence of sexual assault	8	2.6

[a] Note that percentages are not mutually exclusive as respondents selected a total of three topics. These percentages reflect the percentage of respondents that rated each topic in their top three requests for more training.

KY SAKI Response

1. ***Provide Training on Trauma Informed Interviewing***
    - *The KY SAKI Cold Case Unit of KY OAG developed and will implement two-day introductory training on trauma-informed interviews.*
    - *The KY DOCJT and University of Louisville applied for and received funding from the National Institute of Justice to develop and provide a training program that will teach officers about trauma informed interview techniques and allow officers to practice with standardized patient actors.*
2. ***Evaluate Training that is Provided***
    - *The KY SAKI Cold Case Unit and the KY DOCJT have partnered with the University of Louisville to add an evaluation component to new training programs.*

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Appendix A: Full Study Description and Analysis

An average of 33 officers attended each KYDOCJT sexual assault investigations course producing a population of 396 study participants, of which 364 completed surveys (91.9% response rate). At the beginning of the first day of each training session for Groups A (pre- and post-training assessment) and C (pre-training only assessment), a researcher administered paper and pencil surveys to assess officer knowledge and perceptions of victims prior to training. For groups A (pre- and post-training assessment) and B (post-test only assessment), a researcher administered paper and pencil surveys at the end of each training session to assess post-training knowledge and perceptions of victims. **Table A1** displays the demographic characteristics of the full sample and each experimental group, including gender, age, years in law enforcement, education, any prior sexual assault investigation training, and number of sexual assault cases investigated in the past year. On average, participants were 41.17 years old and had 14.43 years of law enforcement experience. The majority of the sample was male (n = 335, 92.0%) and most participants were college educated with over 59% of the sample possessing at least a two-year college degree (n = 217, 59.6%). In regard to prior sexual assault investigation training and experience investigating sexual assault, less than 40% (n = 128, 35.2%) of officers had prior sexual assault investigations training and just over 65% (n = 238, 65.4%) had investigated at least one report of sexual assault in the past year.

Outcome variables

Participants in all groups received a survey containing the same items during pre-training, post-training, and follow-up assessments. We examined the impact of the KYDOCJT sexual assault investigations training on the mean scores derived from three Likert scale outcome variables including: (1) rape myth acceptance, (2) knowledge of state laws, and (3) knowledge of trauma-informed practices. Because some of the KYDOCJT's sexual assault investigations course content was unique to Kentucky (e.g., laws) and few scales exist to measure knowledge of trauma-informed practices, we created some original measures for the current study. These measures were created with input from KYDOCJT instructors to improve word choice and relevance to course topics. The list of items used to create each dependent variable is found in **Table A2**.

Table A1. Full sample and experimental group descriptive statistics (N=364).

	Group			
	A	B	C	Full Sample
	n=144	n=106	n=114	N=364
Variables	n(%)	n(%)	n(%)	n(%)
Gender				
Male	131 (91.0)	92 (95.3)	109 (95.6)	335 (92.0)
Female	13 (9.0)	11 (10.4)	5 (4.4)	29 (8.0)
Age (Mean)	40.56	40.61	42.47	41.17
Years in policing	14.38	13.78	15.13	14.43
Highest education				
High school	56 (38.9)	35 (33.0)	56 (49.1)	147 (40.3)
Two-year or higher	88 (61.1)	71 (67.0)	58 (50.9)	217 (59.6)
Any prior SA training				
Yes	58 (40.3)	34 (32.1)	36 (31.6)	128 (35.2)
No/none listed	86 (59.7)	72 (67.9)	78 (68.4)	236 (64.8)
# SA reports in last year				
0	48 (33.3)	27 (25.5)	51 (44.7)	126 (34.6)
1 to 5	62 (43.1)	56 (52.8)	36 (31.6)	154 (42.3)
6 to 10	17 (11.8)	16 (15.1)	17 (14.9)	50 (13.7)
11 to 20	8 (5.6)	3 (2.8)	7 (6.1)	18 (4.9)
21 or more	9 (6.3)	4 (3.8)	3 (2.7)	16 (4.4)

Table A2. List of items included in each outcome variable

Illinois Rape Myth Acceptance Scale-Short Form (Likert scale: 1 = Strongly disagree through 6 = Strongly Agree)
1. If a woman is raped while she is drunk, she is at least somewhat responsible for letting things get out of control.
2. Although most women wouldn't admit it, they generally find being physically forced into sex a real "turn-on".
3. If a woman is willing to "make out" with a guy, then it's no big deal if he goes a little further and has sex.
4. Many women secretly desire to be raped.
5. If a woman doesn't physically fight back, you can't really say that it was rape.
6. Men from nice middle-class homes almost never rape.
7. Rape accusations are often used as a way of getting back at men.
8. It is usually women who dress suggestively that are raped.
9. If the rapist doesn't have a weapon, you really can't call it rape.
10. Rape is unlikely to happen in the woman's own familiar neighborhood.
11. Women tend to exaggerate how much rape affects them.
12. A lot of women lead a man on and then they cry rape.
13. A woman who "teases" men deserves anything that might happen.
14. When women are raped, it is often because of the way they said "no" was ambiguous.
15. Men don't usually intend to force sex on a woman but sometimes they get too sexually carried away.
16. A woman who dresses in skimpy clothes should not be surprised if a man tries to force her to have sex.
17. Rape happens when a man's sex drive gets out of control.
Knowledge of Kentucky Sexual Assault Laws (Likert scale: 1 = Strongly disagree through 6 = Strongly Agree)
1. In Kentucky, law enforcement must collect a rape kit from a victim, even if the victim does not want to report the crime to the police.
2. Kentucky law requires that the police must collect a rape kit from a hospital within 24 hours.
Knowledge of Trauma-informed Practices (Likert scale: 1 = Strongly disagree through 6 = Strongly Agree)
1. If a victim says they felt paralyzed during a sexual assault, it is a sign the victim experienced a "freeze" response during the incident.
2. When interviewing victims of sexual assault, it is important to show compassion and build rapport with the victim.
3. Victim advocates are important actors in helping a victim through the investigation process.
4. It is important to avoid interrupting victims when interviewing them about the incident.

Rape myth acceptance (IRMA-SF). Rape myth acceptance was measured using the Illinois Rape Myth Acceptance-Short Form (IRMA-SF) scale to assess the level training participants adhered to common misconceptions of sexual assault victims. The IRMA-SF is comprised of 17 Likert scale measures and 3 filler items that are not used to calculate rape myth acceptance scores (Payne et al. 1999). The IRMA-SF is intended to provide a single-factor measure of overall rape myth acceptance and has demonstrated strong internal consistency in prior research with alphas ranging from .83 (Banyard et al. 2007) to .87 (Lonsway et al. 2001). For the current study we used an average of officers' responses to the IRMA-SF measuring officers' level of agreement with common rape myths. Lower levels of agreement indicated less rape myth acceptance. Factor analysis of the IRMA-SF produced a single factor with an eigenvalue of 5.287, and revealed a high level of internal reliability with an alpha of .83.

Knowledge of state laws (KY Laws). The KYDOCJT training instructed participants on new laws implemented to regulate the collection of sexual assault kits. For example, the new laws allowed victims to decline testing of a sexual assault kit for forensic evidence if they do not wish to report the crime to police, and required police to obtain kits from hospitals within five days. To measure the impact of training on participants' knowledge of these laws, two items were created. First, we asked officers to indicate their level of agreement with the statement "in Kentucky, law enforcement must collect a rape kit from a victim even if the victim does not want to report the crime to police." Second, participants were asked to indicate their level of agreement with the statement "Kentucky law requires that the police must collect a rape kit from a hospital within 24 hours." Lower levels of agreement indicated more knowledge of state laws. Because this scale was comprised of just two items, internal reliability was low with an alpha of .24, however a factor analysis of these items produced one factor with an eigenvalue of 1.275.

Knowledge of trauma-informed practices (KTIP). Finally, we sought to examine the impact of training on participants' knowledge of trauma-informed response to sexual assault. A portion of the training covered trauma-informed practices including the neurobiology of trauma, interviewing techniques, and the incorporation of victim advocates in the criminal justice process. Accordingly, to measure knowledge of trauma-informed responses, we created four survey items. We asked participants to indicate their level of agreement with statements such as "it is important to avoid interrupting victims when interviewing them about an incident," and "victim advocates are important actors in helping a victim through the investigation process."

Higher scores on the KTIP scale indicated higher levels of knowledge. Reliability assessment for this scale indicated strong internal reliability with an alpha of .78 and factor analysis of these four items produced a single factor with an eigenvalue of 2.415.

Analytic strategy

Our analyses proceeded in four steps. First, we present balance tests to assess how effective our randomization techniques were at producing balanced groups based on key demographic variables. Second, we tested the immediate effects of training using t-tests and OLS models to examine mean differences between the experimental and control groups for each of our dependent variables. Specifically, we conducted t-tests comparing Group A's pre- and post-training scores, and Group C's pre-test scores with Group B's post-test scores. We also estimated OLS models to compare treatment groups (A and B) with the control group (C) while controlling for demographic variables for each of the outcome measures. In these OLS models, the key independent variable is training (no training = 0; training = 1), measured by whether respondents were in treatment Groups A and B, or in control Group C. These OLS models estimated the effect of training on the post-training scores from Groups A and B and the pre-training scores from Group C for all outcome variables. Third, we used t-tests to assess the long-term effects of training using data from follow-up assessments. Fourth, we checked for pre-test sensitization by using t-tests to compare mean post-test scores for each outcome variable between Groups A (pre- and post-assessment group) and B (post-test assessment only group). By comparing Groups A and B we can determine if the pre-test had a priming effect that impacted Group A's responses to post-test assessments. If we find no difference between Groups A and B, this suggests any changes in the outcome variables are caused by the training instead of pre-testing effects (see Dukes et al. 1995; Solomon 1949).

Results

Balance tests. We conducted balance tests to assess the effectiveness of our randomization technique in producing balanced groups that did not significantly differ on important demographic variables. Prior research has suggested that gender, age, years in law enforcement, education, prior sexual assault training, and experience investigating sexual assault cases can impact police officers' perceptions of victims (see Sleath and Bull 2017). Thus, we completed balance tests for the following six variables: gender (female = 0, male = 1), age (in years), years in law enforcement (in years), highest education level (high school = 0, two-year

degree or higher = 1), any prior sexual assault investigation training (no = 0, yes = 1), and number of sexual assault reports investigated in the past year (none = 1; 1 to 5 = 2; 6 to 10 = 3; 11 to 20 = 4; 21 or more = 5). Our analyses indicated no significant differences for all six of these variables including gender (F = 1.026, p > .05), age (F = 1.273, p > .05), years in law enforcement (F = .539, p > .05), highest level of education (F = 2.939 p > .05), prior sexual assault investigation training (F = 1.368, p > .05), and number of sexual assault reports investigated in the past year (F = .899, p > .05). These results indicate our randomization process was effective in producing balanced groups. However, to be sure our findings were robust, we included these six variables in each of our multivariate models to control for slight differences between groups that might influence the impact of training on our outcome variables.

Immediate effects of training. To assess the immediate impact of training on our outcome variables we completed t-tests and estimated three OLS models that control for demographic variables. Results from t-tests for each dependent variable are described in text, while OLS results are displayed in **Table A3**. We present the analyses of immediate training effects below in order of our research questions.

Research Question #1: Rape myth acceptance (IRMA-SF). When examining the impact of training on IRMA-SF or rape myth acceptance scores, for Group A, a paired samples t-test revealed a significant reduction in the scores for pre-IRMA-SF (M = 1.5180, SD = .47337) and post-IRMA-SF (M = 1.3533, SD = .36511) scores (t (143) = 5.053, p < .001, Cohen's d = .8422).[6] Similarly, an independent samples t-test comparing Groups C (pre-test only) and B (post-test only) produced a significant difference between the control (M = 1.537, SD = .43114) and treatment (M = 1.3502, SD = .38572) groups (t (218) = 3.370, p < .001, Cohen's d = 0.4547). The patterns show a reduction in rape myth acceptance and the design reduces the chances that findings can be explained by a priming effect. Finally, the results of our OLS model that assessed the impact of training on IRMA-SF scores while controlling for demographic variables is displayed in Table 3. Consistent with Hypothesis 1, training significantly reduced

[6] To calculate Cohen's *d*, or standardized mean difference effect sizes for each of our analyses, we used Wilson's Practical Meta-Analysis Effect Size Calculator (found here https://campbellcollaboration.org/research-resources/effect-size-calculator.html). Based on Cohen's (1992) recommendations for interpreting the magnitude of *d*, 0.2 is interpreted as a small effect, 0.5 is considered a medium effect, and 0.8 is interpreted as a large effect.

rape myth acceptance measured using the IRMA-SF (*b* = -.180, *p* < .001, Cohen's *d* = -0.4554), while no control variables were significant in the model.

Table A3. OLS treatment groups (A/B) vs. non-treatment group (C) on outcome variables

Outcome variable						
IRMA-SF	Independent variables	*b*	SE	95% CI		*d*
	Training (Group A/B=1; C=0)	-.180**	.046	-.271	-.090	-.4554
	Gender	.155	.081	-.004	.313	.3899
	Age	-.004	.004	-.012	.003	-.0099
	Years in policing	.000	.004	-.008	.009	.0000
	Highest education	-.041	.043	-.126	.044	-.1016
	Any prior SA training	-.062	.049	-.159	.035	-.1539
	# SA reports last year	-.010	.022	-.052	.032	-.0248
	Constant	1.633**	.151	1.337	1.930	–
	F		4.593**			
	Adjusted R^2		.085			
KYLAW	Independent variables	*b*	SE	95% CI		*d*
	Training (Group A/B=1; C=0)	-.681**	.176	-1.027	-.335	-.4535
	Gender	.447	.312	-.167	1.061	.2940
	Age	.016	.014	-.012	.044	.0104
	Years in policing	-.004	.016	-.035	.028	-.0026
	Highest education	-.064	.163	-.385	.257	-.0417
	Any prior SA training	.042	.188	-.329	.412	.0417
	# SA reports last year	-.156	.081	-.329	.412	-.1018
	Constant	2.299**	.570	1.179	3.420	–
	F		4.452**			
	Adjusted R^2		.082			
KTIP	Independent variables	*b*	SE	95% CI		*d*
	Training (Group A/B=1; C=0)	.436**	.091	.256	.615	.5514
	Gender	-.119	.165	-.443	.205	-.1461
	Age	.016*	.007	.001	.030	.0196
	Years in policing	-.016	.008	-.033	.000	-.0196
	Highest education	.100	.085	-.068	.267	.1227
	Any prior SA training	.207*	.097	.016	.398	.2554
	# SA reports last year	.003	.042	-.080	.086	.0037
	Constant	4.702**	.299	4.115	5.290	–
	F		5.140**			
	Adjusted R^2		.092			

Note: Entries include unstandardized coefficients (*b*), standard errors (SE), 95% confidence intervals (CI), and Cohen's *d*.
*$p < .05$; **$p < .001$

Research Question #2: Knowledge of state laws (KY LAWs). When assessing the impact of training on participants' knowledge of Kentucky laws, a paired samples t-test of pre- and post-

training scores for Group A revealed a significant difference between pre-training (M = 3.0607, SD = 1.48429) and post-training (M = 2.6286, SD = 1.55634) scores (t (143) = 2.459, $p < .05$, Cohen's d = 0.4098). When comparing Groups B and C, independent samples t-test analysis found that control Group C (pre-test only) had significantly less knowledge (M = 3.2269, SD = 1.45072) than treatment Group B (post-test only) (M = 2.2277, SD = 1.45004) based on mean scores on the KY LAWs scale (t (219) = 5.106, $p < .001$, Cohen's d = 0.6889). This suggests that the training is effective as Group B (post-test only) demonstrated more knowledge than Group C (pre-test only). Similarly, our OLS model controlling for demographic variables supported Hypothesis 2. As shown in Table 3, OLS results indicated that training significantly increased officers' knowledge of Kentucky laws net of control variables (b = -.681, $p < .001$, Cohen's d = -0.4535). Additionally, one control variable – number of sexual assault reports in the last year – approached statistical significance (b = -.156, $p > .05$, Cohen's d = -0.1018), perhaps because officers who investigated crimes after Senate Bill 63 went in to effect were more familiar with the new sexual assault laws.

Research Question #3: Knowledge of trauma-informed practices (KTIP). Finally, to assess the impact of training on officers' knowledge of trauma-informed practice, for Group A, a paired samples t-test identified significant differences between pre-training (M = 5.1311, SD = .75691) and post training (M = 5.6171, SD = .63413) scores (t(143) = -7.432, $p < .001$, Cohen's d = -1.2387). Likewise, an independent samples t-test comparing Groups B and C indicated that Group C (pre-test only) (M = 5.1451, SD = .77521) had significantly less knowledge than Group B (post-test only) (M = 5.5601, SD = .90943) based on mean KTIP scale scores (t (218) = -3.651, $p < .001$, Cohen's d = - 0.4926). Finally, our OLS model, including control variables, indicated that training significantly increased KTIP scores (b = .436, $p < .001$, Cohen's d = 0.5514). In this model, two control variables were also significantly correlated with KTIP scores. Age (b = .016, $p < .05$, Cohen's d = 0.0196) and prior sexual assault investigations training (b = .207, $p < .05$, Cohen's d = 0.2554) both significantly increased knowledge. These findings – that age and prior training increased KTIP – are consistent with prior research finding that officers with more experience in policing are less likely to engage in victim blaming (Rich and Seffrin 2012), and that prior training is related to short-term increases in knowledge of victim-centered investigative techniques (Lonsway et al. 2001).

In sum, the analyses of immediate pre- and post-training effects supported the hypotheses that the KYDOCJT sexual assault investigations training would (a) reduce short-term rape myth acceptance, (b) increase short-term knowledge of Kentucky laws, and (c) increase short-term knowledge of trauma-informed practices. The t-test results and the experimental design reduce the chances that findings can be explained by a priming effect of taking a pre-test. Additionally, in each OLS model our training variable produced the largest effect size, indicating that the KYDOCJT had a significant and substantial impact on each of our outcome variables.

Long-term effects of training. While the training was effective in producing short-term effects, we sought to assess the long-term impact of the KYDOCJT sexual assault training on our outcome variables. To achieve this goal, the KYDOCJT permitted the research team to email follow-up surveys to the 250 members of our treatment groups (Groups A and B) in August and September of 2018. After three waves of emails, the response rate was 28.4%, with 71 of our original Group A (n = 49) and B (n = 22) participants completing follow-up surveys that were matched with post-treatment assessments.[7] On average, 361 days (median = 359 days) had passed between participants' first post-treatment assessment and the follow-up assessment, with a minimum of 246 and a maximum of 466 days. Paired samples t-tests were used to compare participants' post-treatment scores obtained immediately after training with longer-term follow-up scores for each outcome variable. Results indicated that the effects of training held up over time. Specifically, mean scores did not significantly differ when comparing post-training and long-term follow-up assessments for IRMA-SF (t (70) = .656, $p > .05$, Cohen's d = 0.1557) and KTIP (t (70) = 1.871, $p > .05$, Cohen's d = 0.4441), while KY LAWs (t (70) = -1.933, $p < .05$, Cohen's d = - 0.4588) mean scores significantly improved in the follow-up assessment. Thus, the follow-up assessment is consistent with Hypotheses 1, 2, and 3, demonstrating that the KYDOCJT sexual assault training is effective at producing both short- and long-term effects.

Pre-test sensitization assessment. Finally, to examine pre-test sensitization, post-assessment scores for Groups A and B were compared using t-tests to assess mean differences for all three post-training outcome variables. Our analyses did not detect significant differences

[7] To ensure that respondents to our follow-up survey did not differ from the full sample, we conducted balance tests on six demographic variables (gender, age, years in law enforcement, highest level of education, any prior sexual assault training, and number of sexual assault reports investigated in the last year) using t-tests. No significant differences were detected, indicating that our follow-up assessment group is comparable to the full sample. These results are available upon request.

between Groups A and B for any of the three outcome variables including IRMA-SF (t (249) = -.067, $p > .05$, Cohen's d = -0.0078), KY LAWs (t (249) = -1.918, $p > .05$, Cohen's d = -0.2231), and KTIP (t (249) = -.610, $p > .05$, Cohen's d = -0.0710) scores. This means we can attribute the detected effects of the evaluation to the KYDOCJT's sexual assault investigations training program, and not a priming effect caused by completing a pre-test survey.

An Evaluation of the Kentucky Department of Criminal Justice Training's Sexual Assault Investigations Course: Results from a Randomized Experiment

A Report to the SAFE Kit Backlog Research Working Group

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