

# The Relationship of Police Officers Age and Educational Level with Their Perception of Bias-Based Policing

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## Abstract

In a survey study of police officers in Alabama, this paper assesses how demographic factors of police officers, their reception of training on cultural diversity, and the awareness of their department's written policy on bias-based policing are related to their perception of bias-based policing practices in their department. To achieve the goal of the present study, a survey of 400 officers was used to run multivariate logistic regression analyses. Three variables display significant association with a police officer's perception regarding witnessing bias-based policing practices. Officers with younger age group, higher education, and longer work experience in the department are more likely to say that they have witnessed bias-based policing practices as compared with their counterparts with older age groups, lower education, and shorter work experience.

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**Index terms**— bias-based policing, racial profiling, officer's age, officer's educational level.

Abstract—In a survey study of police officers in Alabama, this paper assesses how demographic factors of police officers, their reception of training on cultural diversity, and the awareness of their department's written policy on bias-based policing are related to their perception of bias-based policing practices in their department. To achieve the goal of the present study, a survey of 400 officers was used to run multivariate logistic regression analyses. Three variables display significant association with a police officer's perception regarding witnessing bias-based policing practices. Officers with younger age group, higher education, and longer work experience in the department are more likely to say that they have witnessed bias-based policing practices as compared with their counterparts with older age groups, lower education, and shorter work experience.

bias-based policing, racial profiling, officer's age, officer's educational level. The issue of racial profiling began to attract the attention of practitioners and academicians alike as a result of a number of highly publicized events involving racial profiling (Harris, 1999, Harris 2002; Martin, 1999). Until recently, most studies focused on reviews of secondary data—primarily, traffic citations and arrest reports—or surveys of citizens' perceptions. Few have looked at the police officer's view of racial profiling and bias-based policing practices to ascertain views on the subject. The base of many of these conclusions relies solely on citizen reports and analysis of secondary data and does not include the officers' point of view. Ioimo, Tears, Meadows, Becton, and Charles (2007) presented a survey study of police officers' perspectives on bias-based policing in the Commonwealth of Virginia. Their study has value because it is one of only a few studies focused on police officers' own perspectives on bias-based policing. However, their study has limitations. First of all, their study was descriptive, and they simply reported that 21% of police officers in Virginia believed that bias-based policing is practiced by officers in their department. Also, their study was limited to bivariate analyses with chi-square tests.

Other researchers looked at behavioral/attitudinal differences or the interactions between black and white officers (Buzawa, 1981; Reidrich, 1977; Fyfe, 1981; Fyfe, , 1988; Geller & Scott, 1992; Haarr, 1997; Leinen, 1984; Mastrofski, Parks, DeJong, & Worden, 1998; Smith & Klein, 1983; Teahan, 1975; Weaver, 1976). Still others have explored the differences between how white and black officers interact with the communities they serve and have found little differences between these two groups (Brooks, 2001; National Research Council, 2004; Riksheim &

Chermak, 1993; Sherman, 1980). There are studies that show that black officers do act differently than their white counterparts toward black citizens (Alex, 1969; Leinen, 1984). Given the limitations with the prior studies, the current study created a dependent variable, witnessing bias-based policing practice(s) by other officers in the same department. The intent of this study was to determine if police officers recognize when bias-based or racial profiling occurs in their department. One can conceive that a police officer will see a broad act of another officer as a bias-based policing practice if he or she is more sensitive to the bias-based policing issue. In other words, the more an officer is sensitive to the bias-based policing, the more likely he or she will admit to witnessing bias-based policing practice by other officers.

The perception or sensitivity on bias-based policing may be related to an officer's demographic variables, such as race, gender, age group, educational level, and longevity with the police department, as well as the reception of training on cultural diversity and the awareness of his or her department's written policy on bias-based policing. To assess the effects of these variables, the current study obtained a survey of 400 officers from a southern city in Alabama. Logistic regression analyses were employed to introduce multiple variables at the same time.

### 1 a) Definitions of Bias-Based Policing Practices

Defining police practices as bias is not simple. The National Institute of Justice point states -Racial profiling by law enforcement is commonly defined as a practice that targets people for suspicion of crime based on their race, ethnicity, religion or national origin. Creating a profile about the kinds of people who commit certain types of crimes may lead officers to generalize about a particular group and act according to the generalization rather than specific behavior? ([http://www.nij.gov/topics/law-enforcement/legitimacy/racial-profiling .htm](http://www.nij.gov/topics/law-enforcement/legitimacy/racial-profiling.htm))

According to Crank, Kadleck and Koski (2010), there is a prevalent concern for bias-based policing practices within the United States, especially those directed towards ethnic minorities. Thus, research on bias-based policing is very important. However, there has been no consistent definition of bias-based policing, which impedes research on the subject. The scholarly work of Smith and Alpert (2007) identifies racial profiling as also racially biased policing; defined simply as the -?conscious or unconscious use of race by police discretionary decision making (p. 1262).? Since the development of this idea, other scholarly works, much like this one, have sought to evolve the meaning of biased policing, to include more than discretion based on race alone. Expanding Smith and Alpert's (2007) definition of racial profiling, Chan (2011) provides an additional definition of racial profiling that is -?the practice of subjecting citizens to increased surveillance or scrutiny based on racial or ethnic factors rather than reasonable suspicion (p. 75).? Chan's definition includes not only discretionary decisions made by police based on race, but it also includes increased surveillance based on racial bias.

Most of the research surrounding bias-based policing or racial profiling focuses on the behavior of officers during traffic stops. The issue of racial profiling began to attract the attention of practitioners and academicians alike as a result of a number of highly publicized events involving racial profiling (Harris, 1999, Harris 2002; Martin, 1999). Until recently, most studies focused on reviews of secondary data-primarily, traffic citations and arrest reports or surveys of citizens' perceptions. Few have looked at the police officer's view of racial profiling and bias based policing practices to ascertain their views on this highly sensitive subject. Even fewer have assessed the different views that exist between white and minority officers ??Sun & Payne, 2003). Without looking at the officer's point of view, many of the conclusions being drawn are based entirely on citizen reports and analysis of secondary data.

Gender. Researchers have highlighted the idea that women within police organizations tend to experience a confusing or complex role within the organization (Fairchild, 1987; Novak, Brown, & Frank, 2006). ??ovak, Brown, and Frank (2011) found that gender had little effect on the arrest decision. They also found that female officers were more likely to arrest if they were in the presence of a supervisor ??Novak, Brown, and Frank, 2011). Some earlier researchers suggested that it is evidence that female police officers may not be completely accepted into the police subculture (McGeorge & Wolfe, 1976). Other research has found that policewomen are not as likely to support aggressive enforcement, as opposed to males (Sun & Chu, 2008).

Females may be less likely to have an authoritarian attitude and prejudice than males. -Authoritarianism represents the set of beliefs geared toward the subordination of personal needs and values group cohesion? ??Brandt & Henry, 2012, p.1). An individual with an authoritarian attitude is more likely to be hostile toward members of other cultural or ethnic groups (which commonly refers to ethnocentrism) (Kimmelmeiser, 2010). For example, Altemeyer (1998) conducted a survey on Canadian college students and found that female students in general show less prejudice than male counterparts (see also Brandt and Henry, 2012; Lippa, 1995; Napier & Jost, 2008). Finally, based on the analysis of three studies in the USA (n=398) and one study in Germany (n=112), Kimmelmeiser (2010) suggested that men are more likely to have an authoritarianism attitude than women. Conversely, women are likely to display caring and compassion for interpersonal relationships, while they are less likely to possess prejudice toward members of other cultural groups (Kite & Whitley, 1996).

Police have long been known as a closed group that shields fellow officers from outside scrutiny. Solidarity varies across rank structure ??Reiner, 1992). Police officers turn to themselves for moral support when confronting the difficulties, ambiguities, and uncertainties of police work (Brown, 1988; Sun & Payne, 2002). Sun and Payne (2002) point out that it is important to look at demographic characteristics such as sex, race, and ethnicity into account when examining officer attitudes toward peer groups. Male officers treat female officers differently and female officers view themselves as outsiders (Martin, 1994; Sun & Payne, 2002). Others also point out that male officers

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tend to socialize with other male officer (Dulaney, 1996; ??aar, 1997 ?? Sun, 2000). These findings support the need to take sex, race, and ethnicity into account when examining officer attitudes ??Sun, 2000).

Age group. It is a generally accepted view that older generations tend to be more conservative than their younger counterparts. Older individuals have a tendency to possess a greater degree of political, social, and moral conservatism than younger individuals (Ray, 1985). For example, in their study in Belgium and Poland, Cornelis, Hiel, Roets, and Kossowska (2009) found that older people are more likely to have socialcultural conservatism than young individuals. They explained that social-cultural conservatism refers to authoritarianism and the adherence of traditional values and norms.

On the other hand, in their study of 130 families, Bush, Gallagher, and Weiner (1982) found that young adults are less authoritarian than their parents. Bush et al. explained that today's young adults are more strongly influenced by their peer groups, educational setting, and mass media than their parent generations. Based on these observations, one can hypothesize that older police officers in general possess a more conservative attitude and may be more prejudiced toward ethnic minorities than younger officers. Stated differently, younger officers are more likely to adhere to an egalitarian race ideology. They are more likely to be exposed to cultural diversity education.

Police officers in general tend to be more conservative than the populations that they serve ??Skolnik, 1966; ??ayley and Mendelsohn,1969). Studies have shown that police officers gain a better understanding of race as they are exposed to the issues associated with race over time ??Burbeck and Furnham, 1985). In a study of the Spokane Police Department Zhao and Lorch (1998) found that the views officers by age did not change and were consistent over prolonged periods of time. These studies show that bias policing may be more closely related to police culture/ socialization than age.

Race. Attitudinal studies of differences between white and black officers were practically non-existent prior to the 1960s. This was due primarily because there were so few black police officers prior to this time. The need for diversity within police departments across the country saw an increase in the number of black police officers from that period forward. The early research focused on the integration of black officers into police departments (Alex, 1969;Campbell, 1980; ??ee & Ellis, 2000;Martin, 1994;Palmer 1973). Behavioral differences did not appear between white and black officers until much later Buzawa, 1981 Ioimo and others (2007) reported a difference in the perception on bias-based policing between white and black officers within the department. Black police officers were reportedly more likely to believe that biasbased policing was an issue in general and that it was both officially and unofficially supported within their police departments. Black officers may be more sensitive to bias-based policing practices than white officers because they, themselves, are ethnic minorities. Other researchers have sought to determine if there are differences in behavior of black and white officers (Black, 1976; ??ngle & Calnon, 2004;Smith & Holmes, 2003). These differences cause police officers to act on cultural expectations related to race and ethnicity (Black, 1976). This research suggests that police officers' behavior is predicated primarily by legal and situationspecific factors and that the influence of race and other extra-legal factors is diminishing (Mastrofski, Worden, and Snipes, 1995;Riksheim and Chermak, 1993; ??ngel, Calnon, and Bernar 2002).

Some studies focused on the differences between black and white officers and arrest outcomes (Bolton, 2003;Campbell, 1980 Dulaney, 1996; ??eaves, 1991;Thompson, 2003). These studies showed that there are differing views between black and white officers regarding a range of policing issues ??oimo, et al, 2008). The research to date shows mixed results when looking at the differences between black and white officers' attitudes toward the community and bias-based policing. Skogan and Hartnett (1997) There are those that believe officer's race influences their behavior. Earlier empirical research on field officer behavior shows that there was no significant difference between black and white officers on arrest outcomes (Brooks, 2001; ??ational Research Council, 2004;Riksheim &Chermak, 1993;Sherman, 1980;Sun, 2003;Walker & Katz, 2002;Worden, 1989). studied the Cincinnati, Ohio Police Department and found there was a significant difference between white and black officers. White officers are more likely to make arrests in their encounters with suspects . Their research suggests that the premise that officer race has little to do with arrest decisions should be reevaluated .

Other studies show that white and black officers become socialized by the police profession. The concept that developed is that officers, whether they are black or white, are -blue? once they put on that uniform (Skolnick, 1966;Van Maanen, 1973; ??oimo et al, 2008). Members of minority communities in particular hold low levels of trust in police (Tyler, 2002). Many see officers as belonging to a separate group independent of officer race (Tyler & Huo, 2002).

## 2 Educational level. Former president Lyndon B.

Johnson ordered the formation of the President's Commission on Law Enforcement and Administration of Justice to improve the relationship between the police and ethnic minority groups in the 1960s. One of the suggestions by the commission was to hire more college-educated officers and send existing officers to colleges for education. Officers with higher education are more likely to possess egalitarian ideology and understand the benefit of cultural diversity than those with lower levels of education.

## 3 ( )

A significant debate surrounds officers with higher education in law enforcement. The issue of whether college educated officers are able to better perform the job of policing than their non-college educated officers has been debated for some time with many finding little difference between college educated and non-college educated officers (Cascio, 1977; Cohen and Chaiken, 1972; Finnegan, 1976; Krimmel, 1996; Roberg, 1978;). The role of the police officer in today's society is complex demanding greater analytical, technical, and cooperative capabilities ??Geller and Swanger, 1995; Roberg and Kuykendall, 1997; Carter and Sapp, 1990). These characteristics are found with higher educated officers. Some researchers have found that higher educated officers are more likely to become frustrated with the job and seek employment outside of law enforcement (Cascio, 1977; Cohen and Chaiken, 1972; Finnegan, 1976; Krimmel, 1996; Roberg, 1978; Sanderson, 1977; Smith and Ostrom, 1974; Trojanowicz and Nicholson, 1976; Dalley, 1975; ??uller, 1972; Greene et al., 1984; Regoli and Miracle, 1980; Sapp, 1978; Trojanowicz and Trojanowicz, 1972).

There are other researchers that found college educated police officers are more flexible, less authoritarian and have a greater acceptance of minorities (Dalley, 1975; Parker et al., 1976; Roberg, 1978; Smith et al., 1970; Trojanowicz and Nicholson, 1976). Educational level may be related to authoritarianism, which in turn is related to perception of bias-based policing. Some argued that officers with college educations are less likely to possess an authoritarian attitude than non-college educated officers (Dalley, 1975; Roberg, 1978). There is a study on the relationship between educational level and authoritarianism for a general population. For example, in his study of 678 white South Africans, Duckitt (1992) suggested that individuals with college educations are more likely to have lower levels of authoritarianism than those with non-college education. Weitzer and Tuch also found that the better educated officers are more likely to be able to identify bias-based/racial profiling practices when they see it occur (Weitzer & Tuch, 2002). These findings imply that college-educated officers are more sensitive to bias-based policing issues and are more likely to see a broader range of acts of fellow officers as bias-based policing practices and say that they witness those practices.

Longevity. Longevity of police officers may be related to the perception of witnessing bias-based policing practices by other officers either positively or negatively. If the longevity of an officer contributes to an increased exposure to bias-based policing and cultural diversity training, he or she tends to be more sensitive to bias-based policing. As a result, he or she is likely to state that they have witnessed bias-based policing practices by other officers. However, if the longevity leads to acquiring conservative police subculture, he or she is not likely to assert that they have witnessed biasbased policing practices.

Training and written policy. Benforado (2010) acknowledges that the use of simulation training for police officers does help to reduce an officer's tendency towards implicit bias. Additional research presented by Correll, Wittenbrink, Park, Judd, Sadler and Keese (2007) asserted that racial bias is evident in police simulations in the use of lethal force. Specifically, their research looked into the differences between police officers and members of the community on the use of lethal force in the simulation which included white and black citizen targets, both armed and unarmed.

Next, the awareness of written policy may work as a deterrent against bias-based policing. Alpert, Dunham, and Smith (2007) argued for establishing clear policy on bias-based policing to fight against it. Thus, a police officer's awareness of his or her department policy on bias-based policing may be related to the reduction of such a practice in the street.

## 4 a) Survey Procedure

The present study used a survey method. The study used questions developed by one of the researchers in a statewide survey in Virginia (Ioimo et al., 2007). Since this was a tested and proven survey instrument, the researchers elected to use it in this study. The researchers used multiple steps in developing and administering the survey, which is described in this section. In developing this study, it was recognized that the failure to provide a clear definition of bias-based policing at the onset of the study could be viewed as a limitation for this study. However, it was decided that forcing the officers to apply a standard definition when completing the survey had the potential to skew the results. Therefore, no formal definition of bias-based policing was provided before the study. As a result, the interpretation of the bias-based policing was largely dependent on the understanding of the question by an individual officer. However, more than likely, an officer sees bias-based policing as racial profiling or at least a race-related issue.

Before distribution, the survey content was reviewed by an institutional review board at the university where all current authors are affiliated. The instrument was pretested for 50 officers and the command staff of a Southern City Police Department in 2011. During this pretest, the research staff, in a meeting with officers and command personnel, reviewed the completed surveys. At this meeting, the researchers discussed issues of survey content, question presentation, difficulties in completing the survey, survey instructions, method of distribution and collection of completed surveys, and various other survey process issues that could improve the collection. The researchers administered the survey to the officers at roll calls and other formations. The total number of sworn officers in the Southern City Police Department was five hundred and thirty-five. The number of officers who took the survey was four hundred and eight, which was 77% of all sworn officers in the department. All sub-department units, including Narcotics and Special Operations, Traffic Division, Patrol Division, Administration, Detective

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Division, Recruitment and Training, Community Policing, and Accident Investigations were contacted by the researchers at various times to administer the survey with the least operational disruption to the department.

Those officers received informed consent and were allowed to refuse to take the survey. In other words, prior to conducting each survey session, the researchers briefed the respondents that their participation in the survey was strictly voluntary and their anonymity was assured. In particular, all participants were told that the researchers would safeguard the completed surveys, and they should not put any names or other marks on the survey that could identify them as the respondents. Also, the surveys were distributed and collected by the researchers to further safeguard the data and identities of the participants. Further, the respondents were briefed regarding the uses of the survey and told the academic product of the survey would be used by the department's command staff to review bias-based police training in the department and by the researchers for academic purposes, including publication in academic journals.

## 5 b) Variables

The dependent variable is witnessing biasbased policing by other officers in the department. The survey question asks -Have you witnessed bias-based policing activities by other officers in your department??

The respondent can answer either -yes? or -no.? On the other hand, independent variables included race, age, gender, educational level, and longevity with the current police department, reception of cultural diversity and/or bias-based policing training at the police academy, the existence of the same training at the police department, and the awareness of written policy on bias-based training. Some of those variables require further description. First, the current study excluded eight out of 408 officers who stated that they belong to ethnic minority groups other than black because the current study aimed to contrast white and black officers. Also, the number of ethnic groups other than white and blacks is quite small. On the other hand, age group was divided into three: 18-39, 40-59, and over 60. Educational level was classified into seven categories: GED, high school diploma, some college, associate degree, bachelor's degree, master's degree, and doctorate/ Ph.D. Longevity refers to the length of years an officer has worked for the department: 0-3, 4-6, 7-10, 11-15, and 16 years or longer. Finally, training on biasbased policing involves whether or not an officer received bias-based policing and cultural diversity training at police academy, and whether or not the police department provides the same training.

## 6 c) Analytical Strategy

It is appropriate to run logistic regression since the dependent variable was measured with -yes? or -no.? The first model introduced the eight candidate variables discussed above: gender, age, race, educational level, longevity, training at police academy and at the department, and the awareness of a written policy.

The second logistic regression model introduced only the important predictors found in the first model.

## 7 a) Description of Samples

One needs to provide a brief description of the sample in the current study. First, approximately 30% of those officers who took the survey said that they witnessed bias-based policing, while the other 70 percent of them did not. Second, among the total of 400 officers included in the current study, fifty six percent of them are white, while forty four percent are black. Similar to a national average, only ten percent of them are females. Also, a large number of officers (70%) are under 40 years of age. Next, a majority of officers have received some college education or higher (80%). In terms of rank and longevity, many of them are patrol officers (80%) with less than 7 years of work experience with the department (50%).

## 8 b) Study Findings

Table ?? shows the logistic regression results. The regression model 1 introduced all candidate variables. Age group was significantly and negatively related to witnessing bias-based policing at 0.05, while educational level and longevity were positively related to it only at 0.10 level. However, all other variables, such as gender, race, training at police academy, training at department, and the awareness of written policy, did not perform strongly.

Regression model 2 included only three important variables. Age group was still inversely related to witnessing bias-based policing. On the other hand, educational level and longevity were positively related to witnessing bias-based policing practices by other officers. All three variables were statistically significant at the .01 level.

There has been a lack of studies on bias-based policing which were based on a police officer's perspective. To offset the shortcomings of previous studies, the present study tested how police officers' demographic factors, training on bias-based policing, and the awareness of written policy on bias-based policing are related to witnessing bias-based policing practices by other officers. The current study found some interesting results. First, older age is associated with lower likelihood of witnessing bias-based policing by other officers. Older officers may be more conservative and less sensitive to the bias-based policing issue. In contrast, younger officers, who are exposed to egalitarian education, may be more sensitive to the issue. As a result, younger officers are more likely to view broad acts of other officers as bias-based policing practices.

Second, officers with higher education are more likely to admit to witnessing bias-based policing practices by other officers. The officers with higher educational levels may possess a lower level of authoritarianism than those with lower educational level. They might also be more sensitive to bias-based policing issues, so they are more

## 8 B) STUDY FINDINGS

likely to see broad behaviors by other officers as bias-based policing practices. This finding confirms the value of higher education for police officers.

Finally, longevity was also positively related to perception of witnessing bias-based policing practices. The longer an officer has worked for the department, the greater likelihood the officer received training on bias-based policing and cultural diversity. Attending such training may make an officer sensitive to the issue, and thus more likely to admit to witnessing bias-based policing practices. However, as will be discussed shortly, attendance at such training and the awareness of a written department's policy on bias-based policing and cultural diversity have no significant association with witnessing bias-based policing. Therefore, such an interpretation of the result may not be adequate. Another possible interpretation is that an officer who has worked more years simply possesses a higher likelihood of witnessing bias-based policing practices by other officers than those who have worked fewer years. It may be related to the fact that the survey question did not specify a time frame for witnessing bias-based policing.

The variables which failed to show any significant relationship with witnessing bias-based policing deserve a brief discussion: gender, race, awareness of written policy on bias-based policing, bias-based training at the police academy and at the police department. One may speculate that female officers are more sensitive to a bias-based policing issue because female officers are members of gender minority in the police department. However, the current regression result may suggest that female officers are not necessarily more sensitive to bias-based policing than male officers. Another surprising finding is that an officer's race is not significantly related to the likelihood of witnessing bias-based policing practices by other officers in the department. Ioimo and others (2007) reported that black officers are more likely to believe bias-based policing is an issue in their departments. Unlike their findings, the current study suggests that black police officers are no more likely to witness bias-based policing by other officers than white officers. The gap in results between Ioimo and others' (2007) study and the current study may be related to the difference in statistical analyses. Ioimo and others' (2007) study is grounded on bivariate analyses with chi-square tests. Bivariate analyses cannot control other competing variables. The current study employed a more sophisticated technique of multivariate logistic regression analyses than Ioimo and others (2007).

Training on bias-based policing or cultural diversity both at the police academy and the department are not significantly associated with the occurrence of witnessing bias-based policing. Additionally, police officers' awareness of their department's written policy on bias-based policing has no significant relationship with witnessing bias-based policing. These findings are somewhat disappointing because the police department's efforts to increase the awareness of bias-based policing do not seem to affect a police officer's sensitivity to such policing practices. However, it is premature to make such a conclusion because of some limitations of the current study. First of all, the current authors used a broad concept of bias-based policing. As a result, there is some chance that an officer in the present survey may interpret a variety of acts of other officers as being bias-based policing as well as racial profiling. For instance, an officer may have witnessed a gender-based bias incident and conclude it amounts to bias-based policing. Also, there may be a problem with a measurement of independent variable. For instance, age group was divided into three broad categories such as ages 18-39, 40-49, and older than 60. The variation of age group was so small that, as a result, it may not provide a clear relationship between age group and the perception of bias-based policing. Also, some important variables may have been omitted in the current study. For example, a police officer's assignment may be related to the opportunity to witness bias-based policing. Even if a majority of officers in the current study are assigned on patrol (60%), there are still other officers with non-patrol assignments: detectives (20%), patrol support (10%), and other duties (10%). If an officer does not patrol the street, he or she may have a low chance to observe bias-based policing. Also, the survey question does not specify the time frame for witnessing bias-based policing, such as -for the last one year.? As a result, it is hard to interpret the relationship between longevity and witnessing bias-based policing. Conclusively, it is very important to study bias-based policing from the perspectives of the police officer, as well as the citizens. The current study invites further investigation which tests the impact of police officers' demographic variables, training on cultural diversity, and awareness of their department's written policy regarding bias-based policing upon the perception of witnessing bias-based policing practices by other officers. Specifically, future studies must focus on police officers' age and educational level. <sup>1</sup>



Figure 1:

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Figure 2:

Figure 3:





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## 8 B) STUDY FINDINGS

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