



“Reducing Racial Gaps in Referrals and Hiring: Two Experiments
with the Colombian Public Employment Services”

TECHNICAL COOPERATION #: ATN/CN-19207-RG

Deliverable 4: Pre-Analysis Plan (PAP)



1-04-2025

INSTITUTE FOR CULTURE AND SOCIETY
UNIVERSITY OF NAVARRA

**NAVARRA CENTER
FOR INTERNATIONAL
DEVELOPMENT**

Reducing Racial Gaps in Referrals and Hiring: Two Experiments with the Colombian Public Employment Services Pre-Analysis Plan (PAP)

Abstract

An extensive literature exists regarding racial discrimination in hiring decisions based on randomized correspondence studies in high-income studies (Kline et al. 2022, Quillian et al., 2019). While few rigorous studies of hiring bias in Latin America have been conducted, the role of racial bias in public job-matching services in Colombia was demonstrated in Duryea et al. 2025, in which the implicit bias of job counselors was shown to be correlated with lower referral rates of Afro-descendants to job openings. While this earlier study suggests that racial bias in intermediation services may be an important contributor to racial gaps in labor market outcomes, it also raises the question of whether, when making referrals, job counselors internalize the racial preferences of the client firms. This paper focuses on the role of private firms, specifically the racial bias of key hiring personnel in these companies and the dynamics between the firms and the job centers. Specifically, we test if learning about one's own implicit bias by human resource personnel changes hiring-related practices at the firm level, working with X firms. We also provide information to job counselors about the firms and test if making job counselors aware of the task significance of their referrals for Afro-descendants changes job performance.

JEL code: J7, J15, J63; J64

Keywords: Labor Discrimination, Economics of Minorities, Racial Discrimination, Labor Marker Intermediation.

Co-authors' names: Suzanne Duryea¹, Jaime Millán-Quijano², and Yanira Marcela Oviedo-Gil³.

¹ Principal Economist, Inter-American Development Bank (IDB), suzanned@iadb.org

² Resident Fellow, Navarra Center for International Development (NCID) at Universidad de Navarra, jmillanq@unav.es, jmillanq@gmail.com

³ Project Director, Econometría, moviedo@econometria.com

Study sample

This project has two interventions. Intervention 1 will be with the human resources personnel of firms that use the SPE. Intervention 2 will be with job counselors in the job centers that are part of the SPE.

To invite firms and job counselors we organized an online event with the SPE providers (Cajas de Compensación Familiar - CCF -, and departmental and municipality-level job agencies). The SPE also sent an invitation to participate to all their providers. After this process, 42 providers declared their willingness to participate and were contacted by the data collection team to get in touch with their job centers and firms.

Intervention 1 - with firms' human resources personnel:

Our sample includes 867 individuals from 788 firms.⁴ We selected firms and gave priority to those that posted at least one job post in the period between March 2023 and March 2024. To invite firms to participate we used two different strategies. First, we send each firm a personalized email including a link for the entry survey. Using a personalized firm survey, we recruited 455 firms. In addition, we gave each provider a unique link with the entry survey to distribute among its firms. With this strategy, we recruited 342 firms.

Our main outcome - the probability that a given firm hires an Afro-descendant - comes from the SPE data. Hence, we can lose firms that do not post any job vacancies between the treatment and the moment of requesting the data from the SPE (Between November 2024 and February 2025). Among the 788 firms, 741 posted at least one job opportunity on the SPE between February 2023 and February 2024. What is more, between November 2023 and February 2024, which is an equivalent timestamp to the one we will use for our analysis, 702 firms posted at least one job offer.

Taking this into account, we will randomize the 788 firms stratifying by size (less than 50 workers, more than 50 workers), sector (commerce, manufacturing-agriculture, and services), region, age (less than 3 years, 3 years or more), and the IAT score (with one

⁴ Our initial proposal was 1500 firms. However, the providers contact information about firms was not fully updated limiting our capacity reach firms.

respondent with a score lower than 0.35, with no respondent with an IAT score below 0.35).

HR personnel in treated firms will receive information about their IAT score a few weeks after completing the entry survey. Control firms will receive the information 4 months after the treated firms.

Intervention 2 - with job counselors:

Our original goal was to contact 350 job counselors from at least 80 job centers. We were able to enlist 460 job counselors from 122 job centers. Our main outcome for this analysis - the probability that an Afro-descendant is referred to a job - comes from the SPE data. However, in this data, we can only identify the job center, but we cannot identify the job counselor. For this reason, our randomization will be done at the job center level.

We stratify job centers by region, size in terms of how many job counselors work in the job center, size with respect to how many CVs they manage in a given month, and their IAT score (at least one counselor with an IAT lower than 0.35, no counselor with IAT score lower than 0.35).

Job counselors in treated job centers will receive information about the referral and hiring gaps by race a few weeks after completing the entry survey. The control group will receive the information 4 months after the treatment group.

We will not mix the randomization process of both interventions, as we do not want to restrict the analysis to firms that post CVs managed by job centers that are participating in the study.

Hypotheses

Intervention 1 - with firms' human resources personnel:

First, after collecting information about the implicit bias of firms' human resource personnel, we will provide feedback on their own implicit bias (following Duryea et al. 2025 and Alesina et al. 2024). The premise is that most people want to be fair, yet they do not know their own implicit bias. Hence, if a human resource manager is informed about their unconscious preference for white workers through their IAT result, she/he may adjust hiring-related decisions to be less biased, resulting in the hiring of more Afro-descendants. We are attaching an example of the feedback message in Appendix A.

Intervention 2 - with job counselors:

The second intervention tests if providing job counselors with information about the job-seeking process at the firms for Afro-descendants changes racial patterns of referrals of the job counselors. The hypothesis is that job counselors may be underestimating how impactful their actions are on the labor market outcomes for Afro-descendants. This behavior may come from two sources. First, counselors may underestimate the probability that a referred Afro-descendant is selected for a position because they overestimate firms' biases. Second, they may underestimate their importance in the job search process. We call the first channel the mismatch channel and the second the task significance channel. Hence, we will provide information about how important job counselors are in increasing the chances of Afro-descendant employability. Our message has 3 parts.

1. Afro-descendants are less likely to be referred to an opening than non-Afro-descendants.
2. Afro-descendants are more likely to find a job if they are referred than when they apply for a job by themselves.
3. Firms declare that they are more likely to interview an Afro-descendant than job counselors believe.

We use information from the SPE and the entry surveys (both to counselors and firms) to support the three statements. We are attaching the message we sent to the job counselors in Appendix B.

Variables

Intervention 1 - with firms' human resources personnel:

The main outcome variable is the probability that an Afro-descendant is hired for a given job. This information will come from the SPE as we observe who was hired for each job post.

Intervention 2 - with job counselors:

The main outcome variable is the probability that an Afro-descendant is referred for a given job. This information will come from the SPE as we observe who applied and who was referred to each job post.

Treatment effect equation

Intervention 1 - with firms' human resources personnel:

We propose the following ways to estimate the impact:⁵

1. **Aggregate at firm level.** We will use information about all the hirings after our treatment and define A_f the proportion of Afro-descendant hirings by firm j and $I_f=1$ if the personnel in firm f received their IAT feedback. Also, X_f are firm's characteristics including fixed effects at the randomization cluster level. Then, we can estimate:

$$A_f = B_1 I_f + X_f A_1 + e_f$$

In this case, B_1 represents the increase in the proportion of Afro-descendant hirings after the firm's human personnel receive information about their implicit bias.

⁵ We can also use information before the treatment to estimate the impacts in a difference-in-difference style.

2. **At the job post level:** We use data at the job post level and define $H_{jft} = 1$ if the person hired for the vacancy j posted by firm f in month t was an Afro-descendant, 0 otherwise. In addition, X_j are job post's characteristics. Then, we can estimate the following equation:

$$H_{jft} = B_1 I_j + X_j A_1 + X_f A_2 + t + e_{jft}$$

In this case, B_1 represents the change in the probability of hiring an Afro-descendant after the treated firms received their own IAT score.

3. **At the referral level:** We can also exploit the fact that we observe to which job post each seeker applied/is referred to. Hence, we can create a variable $H_{ijft} = 1$, if the individual i who applied (was referred) to post j by firm f in period t was hired, and 0 if the job seeker applied (was referred) to the post but was not hired. Hence, we can estimate:

$$H_{ijft} = B_1 Afro_i I_f + B_2 Afro_i + B_3 I_f + X_j A_1 + X_f A_2 + X_i A_3 + t + e_{ijft}$$

In this case, we can control for job seekers' characteristics (X_i) including $Afro_i$, which takes the value of 1 if the job seeker i is Afro-descendant. It is important to point out that the selection in which job post each person applies is not random; however, once we interact with the random assignment of the IAT information, we can estimate the effect on hiring rates for Afro-descendants due to the information we provide to the firms.⁶ In this case, B_1 represents the differential likelihood of hiring of an Afro-descendant after applying (being referred) to a post from a firm in the treatment group.

⁶ We could also add job post-fixed effects to take into account that the pool of candidates for each job post is different.

For all estimations, we will work only with those firms that participated in the study and posted at least one offer after the intervention. Using the survey data and the SPE data, we will be able to assess the characteristics associated with the probability of being part of the final sample for the analysis.

Intervention 2 - with job counselors:

We propose the following ways to estimate the impact.

1. **At the job seeker level.** We define $R_{ict} = 1$ if the job seeker i who registered in month t was referred to at least one job post by the job center c . Also, $I_c = 1$ if the job counselors in the job center c received our information, and X_c are job center's characteristics. Then, we estimate:

$$R_{ict} = B_1 Afro_{i_c} I_c + B_2 Afro_i + B_3 I_c + X_i A_1 + X_c A_2 + t + e_{ict}$$

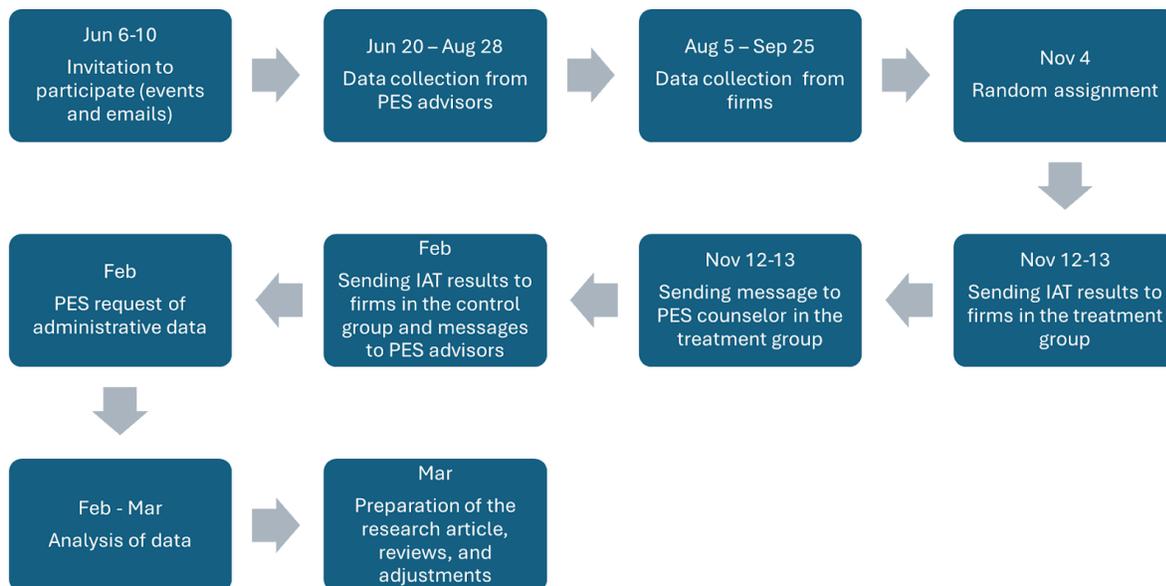
In this case, B_1 represents the increase in the probability of getting at least one referral for an Afro-descendant job seeker due to the treatment received by her/his job center c . As in Duryea et al. (2025), we can define $R_{ict} = 1$, if the person was referred to a job post of type j , to understand for which job types the information has a stronger/weaker effect.

We can also add region-month fixed effects to all estimations in order to control for region trends in labor markets that could affect the referral, posting, and hiring behaviour. For both interventions, to understand the characteristics of job counselors, job posts, and firms, that drive the possible impacts, and the mechanisms driving our results, we will implement an estimation of heterogeneous effects following Chernozhukov et al. (2018). This will allow us to estimate differences by characteristics of the firm (for example sector and race of the HR personnel) combined with characteristics of the applicant and the counselor.

Strategies and procedures to mitigate potential data loss

Given that we estimate the effect using administrative data we do not have standard attrition problems. However, for the analysis of *Intervention 1*, the main risk for our estimations is that the participant firms do not post any job offers between November 2024 and February 2025. We already targeted firms that are very likely to be posting on the SPE. Out of the 449 targeted firms, 434 of them posted a job offer at least once in the period between November 2023 and February 2024. Of the 339 firms that responded to the providers, 268 posted at least one job offer between November 2023 and February 2024. According to this, we are expecting to get information from the SPE data of 89% of our participants with a median of 8 to 9 job posts in 4 months.

Experiment flow and timing



References

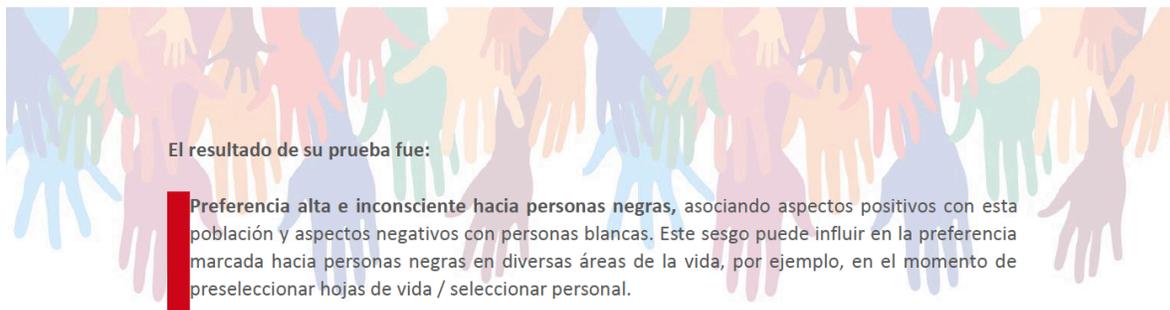
Alesina, A., Carlana, M., La Ferrara, E., & Pinotti, P. 2024. “Revealing stereotypes: Evidence from immigrants in schools.” *American Economic Review*, 114(7), 1916-1948.

Chernozhukov, V., Demirer, M., Duflo, E., & Fernandez-Val, I. 2018. “Generic machine learning inference on heterogeneous treatment effects in randomized experiments, with an application to immunization in India.” (No. w24678). *National Bureau of Economic Research*.

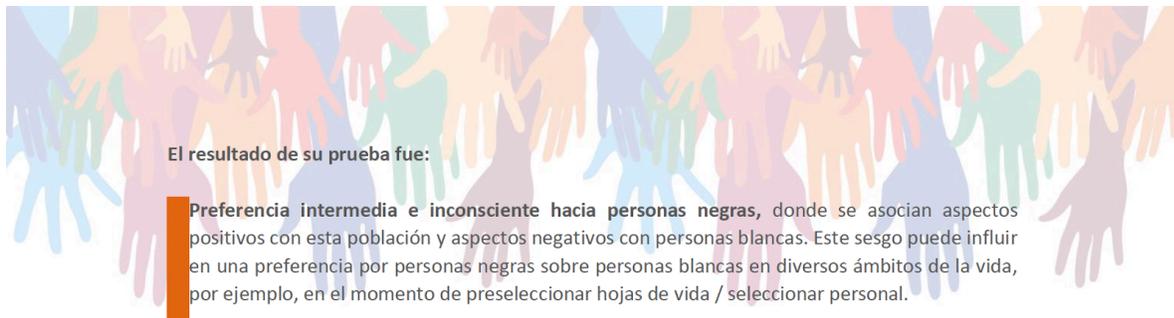
Duryea, S., Millán-Quijano, J., Morrison, J., and Oviedo-Gil, Y. 2025. “Measuring racial bias in employment services in Colombia.” *Journal of Development Economics*, 174:103435.

Appendix A. IAT feedback

The results of the IAT test were classified into seven scales. Each category corresponds to a specific range, and based on the score obtained, the participant is classified into one of these scales. Participants who wanted to receive their results were provided with a document that included their score, the corresponding scale, and a brief description of that score. Here is an example of how people received feedback from the IAT test.

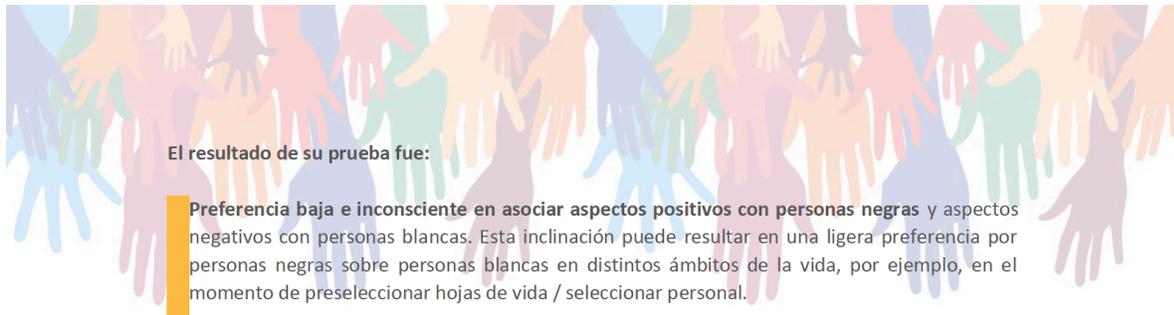


Este resultado se enmarca en la siguiente escala:	
Preferencia alta hacia negros (Menos de -0.65)	◀ -0.73
Preferencia media hacia negros (-0.65 a -0.35)	
Preferencia baja hacia negros (-0.35 a -0.15)	
Es neutral (-0.15 a 0.15)	
Preferencia baja hacia blancos (0.15 a 0.35)	
Preferencia media hacia blancos (0.35 a 0.65)	
Preferencia alta hacia blancos (Más de 0.65)	



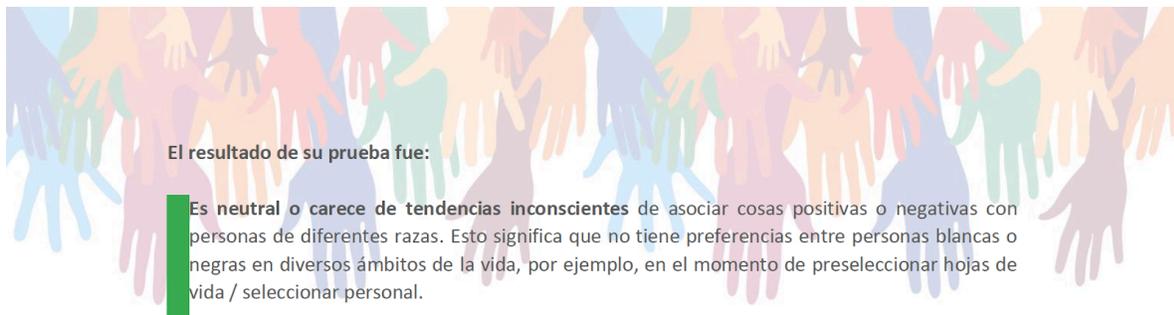
El resultado de su prueba fue:

Preferencia intermedia e inconsciente hacia personas negras, donde se asocian aspectos positivos con esta población y aspectos negativos con personas blancas. Este sesgo puede influir en una preferencia por personas negras sobre personas blancas en diversos ámbitos de la vida, por ejemplo, en el momento de preseleccionar hojas de vida / seleccionar personal.



El resultado de su prueba fue:

Preferencia baja e inconsciente en asociar aspectos positivos con personas negras y aspectos negativos con personas blancas. Esta inclinación puede resultar en una ligera preferencia por personas negras sobre personas blancas en distintos ámbitos de la vida, por ejemplo, en el momento de preseleccionar hojas de vida / seleccionar personal.



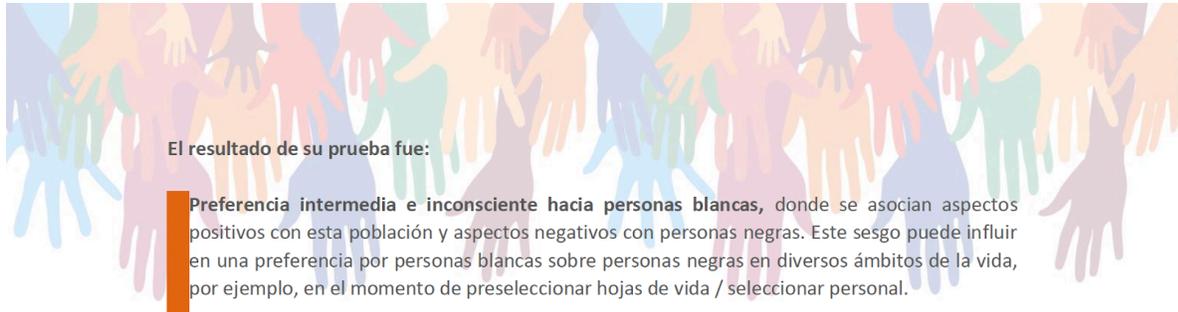
El resultado de su prueba fue:

Es neutral o carece de tendencias inconscientes de asociar cosas positivas o negativas con personas de diferentes razas. Esto significa que no tiene preferencias entre personas blancas o negras en diversos ámbitos de la vida, por ejemplo, en el momento de preseleccionar hojas de vida / seleccionar personal.



El resultado de su prueba fue:

Preferencia baja e inconsciente en asociar aspectos positivos con personas blancas y aspectos negativos con personas negras. Esta inclinación puede resultar en una ligera preferencia por personas blancas sobre personas negras en distintos ámbitos de la vida, por ejemplo, en el momento de preseleccionar hojas de vida / seleccionar personal.



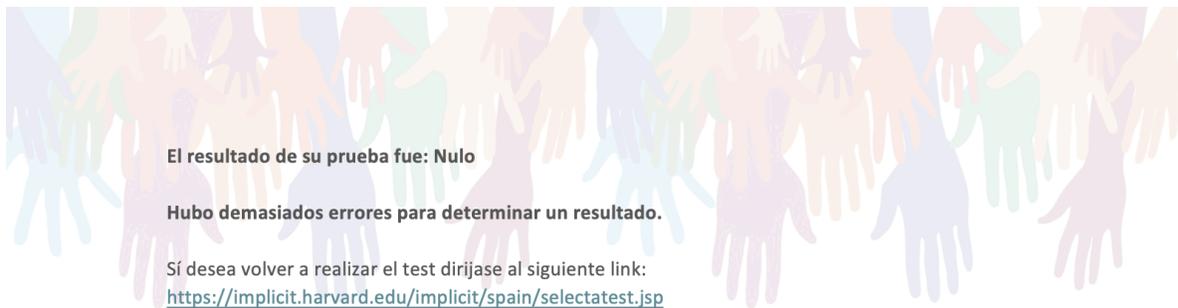
El resultado de su prueba fue:

Preferencia intermedia e inconsciente hacia personas blancas, donde se asocian aspectos positivos con esta población y aspectos negativos con personas negras. Este sesgo puede influir en una preferencia por personas blancas sobre personas negras en diversos ámbitos de la vida, por ejemplo, en el momento de preseleccionar hojas de vida / seleccionar personal.



El resultado de su prueba fue:

Preferencia alta e inconsciente hacia personas blancas, asociando aspectos positivos con esta población y aspectos negativos con personas negras. Este sesgo puede influir en la preferencia marcada hacia personas blancas en diversas áreas de la vida, por ejemplo, en el momento de preseleccionar hojas de vida / seleccionar personal.



El resultado de su prueba fue: **Nulo**

Hubo demasiados errores para determinar un resultado.

Si desea volver a realizar el test dirijase al siguiente link:
<https://implicit.harvard.edu/implicit/spain/selectatest.jsp>

Appendix B. Intervention 2 - message to the job counselors.

Estimado(a),

Sabías que...



ESTUDIO SOBRE PRÁCTICAS DE CONTRATACIÓN

Quisiéramos compartirle algunos hallazgos del estudio en el que usted está participando

A partir de los datos del SISE encontramos que:

1. La probabilidad de conseguir empleo de una persona negra es **18 veces mayor si es referida** a si aplica por su cuenta.
2. **Las personas negras son menos referidas que las personas blancas:** En promedio, una persona negra aplica a 4 empleos y es referida a 1 solo; mientras que una persona blanca aplica a 3 empleos y es referida a 2.
3. **¡Si queremos mejorar la empleabilidad de las personas negras, el proceso de referir es clave!**

¿Sabías qué?

Según nuestra encuesta, **las empresas** manifiestan estar **más dispuestas** a entrevistar y contratar a personas negras de lo que el personal del SPE cree.

Nota: Las personas negras son aquellas que se autoidentifican como negras, afrocolombianas, palenqueras y raizales.



Participan



Dentro de poco lo estaremos contactando para realizar la rifa del iPad.

Una vez más, muchas gracias por participar en nuestro estudio.

Atentamente,
