Bridging the Digital Divide: Data Access and Integration of Venezuelan Migrants in Colombia

Abstract

Unprecedented migration flows necessitate strategies for integrating migrants into host societies' public systems. In a rapidly digitized world, limited internet access and information amplify gaps in government service uptake. We developed an intervention aimed at closing these gaps, based on our theoretical expectations about the untapped power of activating ad hoc migrant networks. In collaboration with an NGO and a Colombian government department, we focused on Venezuelan migrants in Colombia with limited internet access, providing them with unlimited mobile data for a month and messages about public benefits, either individually or in groups. These two interventions led to significant increases in knowledge of public benefits and levels of validated enrollment in the public service portal, but limited increases in other integration outcomes. This study illustrates the potential of using WhatsApp to activate networks and assist migrants in navigating resources within the host society, while also revealing the challenges in achieving broader integration outcomes.

Word Count: 8964

1 Introduction

An estimated 281 million people currently live outside their country of origin, 110 million of whom are forcibly displaced (United Nations, 2020). Notably, 85% of these displaced individuals are hosted by countries in the Global South (Blair et al., 2022), where strained socioeconomic systems and infrastructures pose challenges in reaching migrant populations and integrating them into host societies. This often leads to under-enrollment in social services among eligible individuals, exacerbating socioeconomic disparities and hindering their integration and well-being. Enhancing navigational integration (Harder et al., 2018) for vulnerable populations, i.e., the ability to access key resources in a host country, is thus a primary concern. Governments increasingly provide online resources to connect individuals with government services, yet barriers persist in the form of limited internet access, challenges providing information in legible formats, and limited network support.

We study one of the largest displacement crises in recent history, where more than six million Venezuelans fled the country as refugees and migrants (United Nations, 2020), whether due to dire economic situations or political persecution and violence (Salas-Wright et al., 2022). More than a third emigrated to Colombia. While many are eligible to access the same public services as native Colombians, millions of Venezuelans still lack access to social services. We design and assess the effects of an intervention aimed at reducing internet and informational barriers with the goal of increasing take-up of government services and shedding light on the role of group-based communication in shaping integration outcomes. We specifically examine engagement of Venezuelan migrants with Portal Ciudadano (Citizen Portal), an online platform introduced in 2021 to facilitate user interaction with Colombia's national Sisbén program (Identification System for Potential Beneficiaries of Social Programs). This program gathers data on the economic and social status of lower-income individuals living in Colombia in order to inform decisions regarding social service provision. The Portal Ciudadano is the hub where individuals can ascertain their Sisbén registration status, access their information, request modifications, and explore Sisbén ser-

vices.

Collaborating with an international NGO, *Innovations for Poverty Action Colombia*, and the *Departamento Nacional de Planeacion (DNP)*, the Colombian government agency responsible for coordinating and supporting public policy planning, we are able to reach the community of Venezuelan migrants in Colombia who have registered with Sisbén but who have not registered on the online portal, Portal Ciudadano. Among this population, our study involves the subset who have no computer and limited to no internet access. This is a particularly vulnerable population, and one which an increasingly digitized state has special difficulty in "seeing." Our randomized controlled trial thus has three treatment arms: first, the provision of mobile phone credits in the form of an unlimited monthly plan. The two other treatment arms include this monthly plan in addition to information. Second, then, is the treatment in which this information took the form of direct messages about Portal Ciudadano. In the third treatment, subjects receive these messages as part of moderated WhatsApp groups of around 30 other migrants. These groups serve the dual purpose of providing users with legitimate information while also facilitating connections among migrants, enabling information exchange and feedback. We assess the effects on migrants' navigational integration (knowledge of and actual enrollment in Portal Ciudadano), as well as other proxies of integration, primarily trust in the government, success in the labor market, and overall well-being.

Receiving data and information about social programs, both directly ("Data+Information") and through WhatsApp groups ("Data+Information+Groups"), significantly increased Portal Ciudadano registrations by around 26%. "Data+Information+Groups" recipients registered at slightly higher rates than "Data+Information", and also demonstrated more factual knowledge of the programs and better online information retrieval skills. Analyzing the content of WhatsApp groups, we argue that this was a function of participants sharing answers and instructions within the group, highlighting the underestimated power of even ad hoc groups in circulating information and completing digitally demanding tasks. However,

it is noteworthy that this treatment also increased negative perceptions of other Venezuelans. While some found the conversations helpful, others found them distracting, suggesting an important tradeoff of group-based interventions. Regarding other dimensions of integration, while there was no significant increase in employment rates, participants in the "Data+Information+Groups" arm reported having received additional training opportunities during the intervention weeks. In terms of socio-political outcomes, we find that interest in government programs surged across the first and third treatment arms, though this did not translate into increased trust in the government. Unexpectedly, though consonant with a growing literature on the effects of internet use in developed countries, participants across the three arms reported diminished optimism and increased frustration compared to the control group.

This study contributes to several distinct bodies of literature, enhancing our understanding of migrant integration (Fouka, 2024; Harder et al., 2018; Hotard et al., 2019; Graham et al., 2020; Zhou et al., 2023), the role of communication technology in public service delivery (Moorena et al., 2020; Batista and Vicente, 2018; Suri and Jack, 2016; Lee et al., 2021; Aker et al., 2012; Lashitew et al., 2019), and the importance of digital literacy in mobile, WhatsApp-based contexts in the Global South (Guess et al., 2020; Correa et al., 2022). Practically, this research serves as an example of effective collaboration among researchers, a non-governmental organization, and a governmental agency (the DNP) to inform policy. Our partnership with the DNP in Colombia granted us access to hard-to-reach Venezuelan migrant populations, enabling us to observe behavioral outcomes – difficult to obtain otherwise – related to enrollment in public benefit portals. Hence, unlike most of the existing work that has to rely on self-reported outcomes, we report levels of actual enrollment in the national public benefits portal.

Perhaps the most promising result from our experiment, both theoretically and for policy, proceeds from our novel group-based information provision. Previous developmental policy interventions have tended to focus either on individuals or on pre-existing networks.

Our population of migrants is distinctive – our subjects tend to lack access to local communication networks. A recent World Bank report finds that lack of "networks and social capital" is one of the most important barriers to the integration of these Venezuelan migrants to Colombia (Dávalos et al., 2023). These migrants are far more likely to use WhatsApp than any profile-based social media platform, and while WhatsApp is a useful tool for circulating information in large groups or for maintaining connections with existing strong ties, the affordances of WhatsApp (unlike, for example, Facebook) are not designed for the creation or cultivation of new social ties. Our group-based intervention demonstrates the important role that even *ad hoc* networks can play in public benefits uptake. These "loose-tie" networks can act as a force multiplier for government efforts, especially when dealing with a population with varying levels of digital literacy. By experimentally manipulating users access to other migrants in similar situations and facing the same kind of challenges, our design reveals the impact of such connections on individuals' ability to navigate the resources available in host societies.

Taken together, our experiment deploys a progressive treatment with three components, each aimed at addressing one of the key barriers to integration identified by Dávalos et al. (2023): resource (data) limitations, lack of information, and lack of social capital. We find that each component of our bundled treatment had significant effects on at least some outcome – but that they were not straightforwardly additive. This has implications on aspects of integration and the types of subjects that are most likely to benefit from each of our treatment variations.

2 Migrant Integration, Public Service Delivery and Digital Literacy

In formulating our theoretical expectations and designing the study, we integrate insights from research on migrant integration, the role of communication technology in public

service delivery, and digital literacy.

2.1 Migrant Integration

Migrant integration is complex. There are several distinct components necessary for individuals to adjust to and thrive in their host communities. Harder et al. (2018) operationalize integration as having six dimensions: psychological, economic, political, social, linguistic, and navigational. This paper focuses particularly on navigational integration Harder et al. (2018), which involves migrants' ability to access information and resources in the host country, and which is strongly correlated with success in the other dimensions. The navigational integration dimension holds particular importance for Venezuelan migrants in Colombia, as they already share other characteristics with the host country that could facilitate integration (e.g., language, religion). The significance of having access to information and the ability to navigate the host country, in terms of for example being included in safety net (Condon et al., 2016), for ensuring migrants' success and well-being is evident. Yet, incomplete uptake of social benefits is a problem globally (Ko and Moffitt, 2024; Yasenov et al., 2019).

In the context of Venezuelan migrants in Colombia, a recent survey (2021-2022) (Dávalos et al., 2023) identified four main barriers: institutional challenges in regularizing status, (mis)perceptions, lack of networks and social capital, and limited information access. All participants in our sample have regularized status, rendering them eligible for the relevant public benefits. Our intervention directly thus targets the latter barriers: it aims to enhance the information ecosystem and the networks of migrants by providing a month of unlimited mobile data along with information, either directly or in WhatsApp groups. We then test the effects on improving the uptake of public benefits, specifically focusing on enrollment in Portal Ciudadano as our main proxy for navigational integration. Additionally, we measure outcomes related to economic integration, such as job market success, and socio-political integration, including perceptions of the government and other groups,

as well as subjective well-being.

In doing so, this study also contributes to the growing literature on the economic integration of refugees and labor market matching (Åslund et al., 2014; Abebe et al., 2021; Bazzi et al., 2021; Battisti et al., 2019). Individuals with lower online access face higher search costs, as they are much less likely to be exposed to job postings or job-related information which is increasingly advertised online or spread through online networks. This leads to inefficiencies, such as poor employer-employee skill matching and delays in job seekers finding suitable opportunities. These challenges are heightened in communities like those in our study, where migrants navigate a new host-country labor market amid migration complexities. Enhanced data access may facilitate a more efficient worker-job matching process. Furthermore, the treatment arm that places individuals into WhatsApp groups, aiming to expand the networks of our migrant participants, could open up new job and training opportunities. Recognizing that employment levels are difficult to shift over the short span of four weeks, we also capture efforts to find jobs and other career training opportunities that our participants may have been able to capitalize on as a result of our intervention.

Another set of potential downstream effects of our intervention relates to socio-political outcomes, primarily interest and trust in the government and subjective well-being. Providing information about the functioning of government services has shown some positive effects on cultivating legitimacy, which is crucial for migrants who often have limited connections to the state in their new territories. For instance, Barnes et al. (2018) demonstrate that providing UK citizens with a "Taxpayer's Receipt" detailing government spending increased their knowledge about government expenditures. Similarly, Buell et al. (2021) runs a field experiment where a municipal government sent photos of employees addressing specific citizen complaints, which enhanced both the use of government services and trust in the government. Our concern is that many migrants are unaware of existing government programs. We hypothesized that giving migrants information about services in

Colombia and a platform to share experiences would increase their support for and interest in the Colombian government. Additionally, reducing data barriers was expected to improve subjective well-being, assuming these barriers were sources of frustration and anxiety for participants.

2.2 Public Service Delivery and Communication Technology

Improving migrant integration across all these dimensions requires connecting individuals with key resources in the country, which are increasingly available online. This necessitates the ability to access and successfully navigate these resources. The first step in improving migrant integration is ensuring access to a mobile phone, which all participants in our sample possess. A rich body of research underscores the positive effects of increased mobile phone access: it facilitates remittances (Moorena et al., 2020), enhances consumption smoothing (Batista and Vicente, 2018), and reduces extreme poverty (Suri and Jack, 2016; Lee et al., 2021). Furthermore, mobile phone access has been linked to improved educational outcomes (Aker et al., 2012) and greater financial inclusion (Lashitew et al., 2019), especially when combined with training on financial services or mobile platforms. Access to mobile phones also reduces search costs in labor markets, potentially increasing workers reservation wages and job arrival rates, while reducing unemployment.

However, the limitations associated with mobile data access often prevent users from fully leveraging these benefits. Moya et al. (2023) is particularly relevant to our case, as they also conduct a digital information experiment delivered via WhatsApp to encourage Venezuelan migrants in Colombia to complete a step in the process of regularization. Their experiment randomly assigned Venezuelan migrants to intervention videos aimed at raising awareness and building trust in this regularization program. Surprisingly, they found that program take-up rates were eight percentage points *lower* among individuals exposed to the intervention videos compared to the control group. Exploring the heterogeneity driving this result, they find that it is driven by individuals who received the videos but did

not watch them. These individuals tended to be "older, busier, and have less internet and WhatsApp access."

Our approach to improving navigational integration begins with what is undeniably a necessary condition for interacting with online resources – ensuring that participants have sufficient mobile data to fully access those resources. Through our collaboration with *Innovations for Poverty Action* and support from Colombia's *Department of National Planning*, we are able to target a population with limited or no access to mobile data. Our intervention provides unlimited mobile credit to all treated subjects. We have chosen to implement the treatment via WhatsApp, considering the heavy reliance of Venezuelan migrants on mobile phones and WhatsApp for accessing information, opportunities, and resources (Chang, 2020).

To understand to what extent lack of data is the sole barrier to online integration, we implement a second treatment arm that provides information. While all treatment arms receive unlimited mobile data, a subset also receives weekly messages about Portal Ciudadano over the course of a month, explaining various aspects of the sign-up process and potential benefits of enrollment. This approach contributes to other informational interventions drawing insights from the nudge literature, which has gained popularity in behavioral economics over the last two decades. Nudges – small interventions aimed at predictably altering behavior without restricting alternatives or changing economic incentives – have shown mixed results in recent experiments (Bhargava and Manoli, 2015; Hainmueller et al., 2018; Finkelstein and Notowidigdo, 2019; Hotard et al., 2019; Domurat et al., 2021)[1]. In the literature on public benefit uptake by low-income populations, increasing access to or simplifying information has proved promising, recently in increasing citizenship-application rates (Hainmueller et al., 2018).

Our third treatment arm is perhaps the most novel aspect of our design, drawing on our theoretical expectation of the significant role that networks play in assisting users with

[1]It is worth noting that publication bias means unsuccessful nudges are seldom documented in published literature (Franco et al., 2014)

navigating the digital landscape. WhatsApp, by connecting migrants with each other, can facilitate various beneficial outcomes – providing information about job opportunities, enhancing well-being, and cultivating community. It also enables collaborative information processing, which is particularly beneficial for engagement in digitally mediated tasks. We thus theorize that ad hoc, "loose-tie" networks can have an important role in completing digitally demanding tasks and consequently navigational integration, building on the growing body of research on digital literacy.

2.3 WhatsApp and Digital Literacy

Beginning with Hargittai (2001)'s pioneering work on "internet skills," the line of research on "the second digital divide" emphasizes that literal internet access in terms of technical connectivity is insufficient to actually *access* the resources and opportunities the internet can offer. Our work offers a rare opportunity to experimentally manipulate both of these elements of internet "access" at once.

We adapt recent work which tests how survey measures compare with digital trace measures in differentiating between respondents drawn from high and low-information literacy samples (Guess and Munger, 2023). The authors conclude that digital literacy should be operationalized as consisting of a skills component and an information literacy component. Munger et al. (2024) provides an immediate descriptive antecedent to our project, adapting the Guess and Munger (2023) approach to the contexts of Colombia and Mexico. They demonstrate that the *ways* in which people from these countries get online is distinct from most of the better-studied global north contexts. Treré (2020) explains WhatsApp's appeal in these contexts:

> "*[I]ts simplicity, reliability and accessibility are some of its core selling points, especially for people in the Global South where online services are accessed mainly through cellphones and several connectivity and bandwidth issues are often thwarting a rapid and fluid digital experience.*"

This informs how we conceptualize and operationalize digital literacy; we follow their recommendation to focus on the specific affordances of WhatsApp, the most-used social media platform in Colombia and throughout Latin America (Correa et al., 2022). The simplicity of the WhatsApp interface removes a barrier to using the internet – but the phrase "using the internet" disguises important differences in how the internet is used, by different people and for different purposes. On the one hand, the simplicity and accessibility of WhatsApp has allowed the baseline integration of populations who would otherwise be unable to cross the digital divide. Government, social and commercial services in the Global South have found ways to communicate via WhatsApp where their counterparts in the Global North would be more likely to use phone apps or websites. Indeed, both the surveys and the informational interventions that we deploy in this study are delivered via WhatsApp, as is increasingly common in related studies in the region (Guess et al., 2020; Diaz et al., 2023).

For the case of Venezuelan migrants, various local experts have highlighted digital literacy as an important aspect of the integration process. Some migrants mentioned, "I don't have access to the internet or a high-end smartphone, and I'm not good with technology," as a barrier to documentation access, while workers from the International Rescue Committee (IRC) noted that for several interaction with the government "good internet connection is indispensable." (Moloney, 2021). But on the other hand, not *everything* can be done via WhatsApp. This includes signing up for and updating the online platform Portal Ciudadano that is the focus of our intervention.

With this understanding, we argue that the two treatment arms in which information is provided to subjects address two distinct types of online communication and thus two types of internet skills. The individual, directed treatment arm is more similar to traditional conceptions of digital literacy: people read the information on WhatsApp and receive the data credits, but to use the data credits to find relevant information, sign up for Portal Ciudadano or look for jobs or job training, they need to individually navigate the web

through a standard web browser.

Relatedly, there are empirical challenges in conducting research on low digital-literacy populations. As Munger et al. (2021) argues, this issue arises because digital literacy is a pre-requisite for accessing the sites that recruit these online convenience samples. Our study avoids this problem by sampling at random from the official Sisbén database of regularized Venezuelan migrants.[2] Furthermore, we expect an significant degree of variation in digital literacy within a sample of generally poor and poorly-integrated migrants. The Venezuelan case is unusual because many of these migrants once belonged to a professional and highly-educated workforce that experienced a large negative wealth shock due to the collapse of the Venezuelan economy.

2.4 Hypotheses

Drawing on the literature above, we pre-registered our hypothesis (H1) that participants who receive unlimited mobile credit will report higher level of knowledge about public benefits program (Portal Ciudadano). We also expected (H1a) the effects to be most pronounced for participants who receive unlimited mobile credit and participate in moderated WhatsApp groups (treatment arm 3, "Data+Information+Group"). The rationale behind H1a was that participants may acquire more knowledge about existing assistance programs through the comments and questions of others within WhatsApp groups. If so, the enhanced network from being put in WhatsApp groups would reinforce the positive effect of the treatment. To test this main hypothesis, we captured engagement with Portal Ciudadano in three ways: measuring factual knowledge about Portal Ciudadano, self-reported interest in government programs, and behaviorally validated enrollment in Portal Ciudadano [3]. Our second hypothesis posited that increased information about government

[2]There may be migrants who have emigrated illegally or who have not yet been regularized and who therefore do not appear in the Sisbén database; they are outside of the scope of our study.

[3]This outcome was not pre-registered since at the time of pre-registration we did not know that we would be able to receive the validated enrollment information from the DNP.

programs would lead to stronger trust in the host government. We also anticipated that the positive treatment effect would be most pronounced for participants who received unlimited mobile credit and direct messages (treatment arm 2), as this group would have experienced a stronger signal of government capacity.

Our third hypothesis pertains to improved job market outcomes (H3). We acknowledged that this outcome may be challenging to impact within a one-month timeframe, which is why we conceptualize job market outcomes broadly. We measured a set of less demanding outcomes, such as whether individuals pursued additional educational or training opportunities, and whether they spent more time seeking a job. We also hypothesized two possible downstream effects of increased knowledge of government programs, one of which is increased trust and interest in the host government. Specifically, we expected that the second treatment arm ("Data+Information") might be most effective in fostering these feelings, as participants received direct messages, which could lead them to updates their beliefs about government capacity and foster strong connection to the host society. Finally, we hypothesized that having unlimited mobile data and information about the assistance programs may lead to an increase in subjective well-being. This could stem from the elimination of data barriers or, for those put in WhatsApp groups, an enhanced support network.

3 Research Design

3.1 Context: Venezuelan Migrant Crisis, Sisbén, & Portal Ciudadano

More than six million Venezuelans have fled their country's economic and humanitarian crisis, with over half relocating to Colombia. As of 2023, Colombia is the primary destination for these migrants, making their integration a critical issue (Ham et al., 2022; Bahar and Dooley, 2019). Our intervention is conducted in collaboration with the Departamento Nacional de Planeacion (DNP), the Colombian government agency responsible for

coordinating and supporting public policy planning. The DNP also administers the Sisbén (Identification System for Potential Beneficiaries of Social Programs), established in 1995 to classify populations in poverty and facilitate their access to government benefits. This system has been extended to include Venezuelan migrants, helping them access services like the Subsidized Health Regime and other subsidies.

As of 2022, over 27 million people – about half of Colombia's population – were registered in Sisbén, primarily those in poverty and needing state support. The accompanying online portal, Portal Ciudadano, launched in November 2021, aims to update registered individuals' data, enhance understanding of Sisbén, and increase engagement with its programs. Through this user-friendly interface, users can update their information, add household members, make various requests, and learn about the system's operations. However, based on discussions with DNP officials, the registration rate among migrants on Portal Ciudadano is low due to a lack of awareness about the registration process and the DNP's limited capacity to reach this community which we argue can be overcome by taking advantage of the widespread use of WhatsApp.

3.2 Recruitment and Sample Description

Innovations for Poverty Action facilitated our access to a database from Sisbén that consisted of 67,714 Venezuelan migrants from five cities (Bogotá, Medellín, Cali, Barranquilla, and Cúcuta). All participants in the sample held Temporary Protection Permits, which provide temporary protection, legal status, and access to essential services and rights for a specified period. IPA sent emails to a randomly selected subset of participants within the database, gauging their interest in participating in a research study about public services in Colombia. The selection criteria for our sample were as follows: individuals aged 18 or above, who had no or some access to the internet or a computer, who were heads of their households, and who were registered in Sisbén but not registered for Portal Ciudadano. The sample comprised 1,727 participants who completed both the baseline and endline

surveys. The experiment took place from August to October of 2023 (SI, Section C).

Table A1 shows basic descriptive statistics about the sample. Overall, 61.2% participants are women and the average age is 37.6 years old. The majority of participants, 64.6%, reported having middle or high school education, and only 36.4% reported being employed at baseline. Participants also responded to questions about their time spent on different activities, including online activities, such as getting in contact with relatives and friends, reading the news, on entertainment, looking for a job or for social programs, and using social media. Participants reported more time spent on WhatsApp than with family and friends or in non-tech activities. WhatsApp is also unsurprisingly the most widely used social media platform among participants, which underscores the usefulness of WhatsApp for the interventions as the one in this project.

3.3 Treatment Assignment

Our sample of 1,727 participants was randomly assigned to one of the four treatment arms.

T1. Data: One month of unlimited mobile data (N=525)

T2. Data+Info: Mobile data and direct messages about social programs (N=526)

T3. Data+Info+Group: Mobile data and messages within WhatsApp group with other (up to 30) participants (N=543)

C. Control: Mobile data and direct information after endline survey (N=562)

IPA provided mobile phone credits of around 15 gigabytes for a month to the participants in the three treatment arms, which is estimated to allow one to browse the internet for around 180 hours. Participants in the second and third treatment arms – "Data+Info" and "Data+Info+Group" – received government information about Portal Ciudadano and Sisbén as well as 15 gigabytes of data. We also had a moderator who was trained by

the DNP to be able to accurately respond to participant inquiries on the topic throughout the intervention. The moderator sent three messages weekly to each of the WhatsApp groups.[4] However, while the second treatment arm received these direct messages on WhatsApp about social programs, the third treatment arm received the messages within WhatsApp groups with other participants. Subjects in this last condition were divided into 18 groups of approximately 30 participants. Participants were allowed and encouraged to ask questions and interact around the information sent by the moderator. Participants were also allowed to spontaneously interact between one another, as long as there was no hateful, false or misleading speech involved. Besides sending the weekly messages and specifically responding to questions from the participants, the moderator kept a passive role in the group, as to allow for spontaneous and free interaction among the participants. The intervention was carried out from August to October 2023 as summarized in Figure C.1.

4 Empirical Strategy and Data

Our data comes from three different sources. First, we use administrative data from the DNP's Sisbén. Sisbén has detailed baseline demographic information about Venezuelan migrants, including gender, education, and marital status. Second, we designed screening and baseline surveys to retrieve information about internet use, data access, and phone plans. In the endline, we added a series of questions divided into five large groups: i) interest and knowledge in the social program (Portal Ciudadano), ii) job market outcomes, iii) trust in institutions, iv) well-being and v) battery of questions to capture digital literacy. All the questions are in the Appendix, Section C. Third, we merged the two previous databases with validated behavioral enrollment in the DNP's "Portal Ciudadano", which allows us to capture whether the participation in this intervention led to higher sign up

[4]Following the IRB protocols, this same set of 12 messages was also sent to 441 individuals from the control group who responded to the endline survey, after study completion.

rates.

The unit of randomization is the individual. We implement block randomization by location to minimize differences between units in each treatment condition. We estimate the effects with an ordinary least squares (OLS) specification in which the treatment indicator variables represent assignment to each of the three treatment arms *Data*, *Data+Information*, and *Data+Information+Group* treatment arms. The specification is as follows:

$$Y_{im} = \alpha + \beta_i Treatment_i + \lambda X_i + \mu_m + \epsilon_i$$

where outcome Y_i represents the outcome for participant i within a municipality *m* and is regressed on $Treatment_i$ indicators (i.e., assignment to Data, Data+Information, Data+Information+Group, or Control group), X_i a vector of individual controls measured at baseline (age, education, gender, and marital status), and μ_m is a municipality-specific fixed effect.

5 Results

We start by describing the interactions within WhatsApp groups (third treatment arm), after which we present survey results.

5.1 Interactions Within WhatsApp Groups

The third treatment arm consisted of connecting migrants into 18 WhatsApp groups of approximately 30 participants. For assignment to WhatsApp groups, we carried out stratified randomization on gender, age and educational level. To manage the intervention, IPA hired a moderator who was responsible for sending a weekly set of three messages – all related to Sisbén and the Citizen Portal – to each of the WhatsApp groups. All of these

messages were designed and approved by the National Planning Department, as part of their official communication strategy. Each week, one of the three messages contained videos instead of plain text messages. The moderator was trained by the National Planning Department to be able to accurately respond to participants inquiries on the topic throughout the intervention. Overall, interactions from the moderator as a proportion of total interactions ranged from 4.9% to 51.4%.

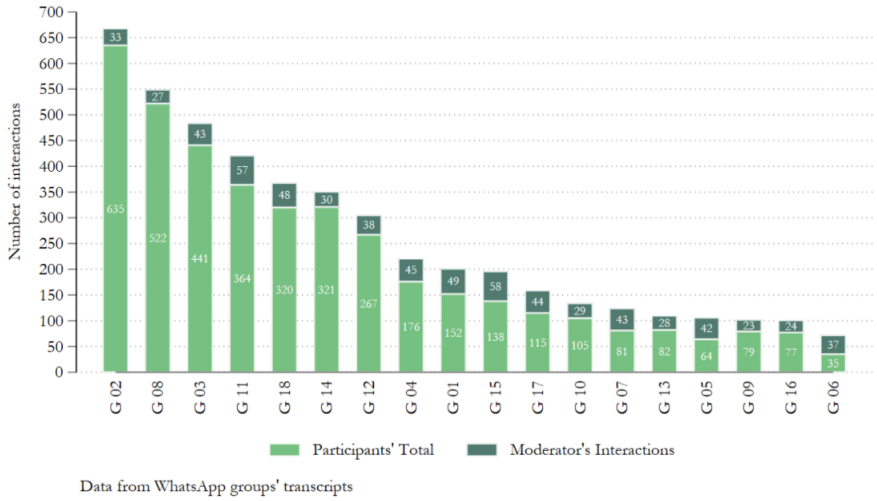

Figure 1: Total number of interactions by group

The interactions across WhatsApp groups varied significantly, ranging from groups with 35 to 635 messages. Of all messages sent, 21.7% exceeded 90 characters, classified as "meaningful" and often included questions, clarifications, or key information from participants. User interactions revealed four primary themes: intervention queries, access to social programs, concerns about Sisbén, and customer service issues (SI, Section E). Some discussions also touched on employment and emotional support. Participant engagement also varied we classified participation into high, medium, and low levels. Among active participants, 51.4% had low interaction levels (1-14 messages), 10.3% medium (15-41 messages), and 3.7% high (>41 messages). Additionally, 25% of participants were inactive (stayed in groups, but did not produce content), and 9.6% withdrew from the groups before the endline survey.

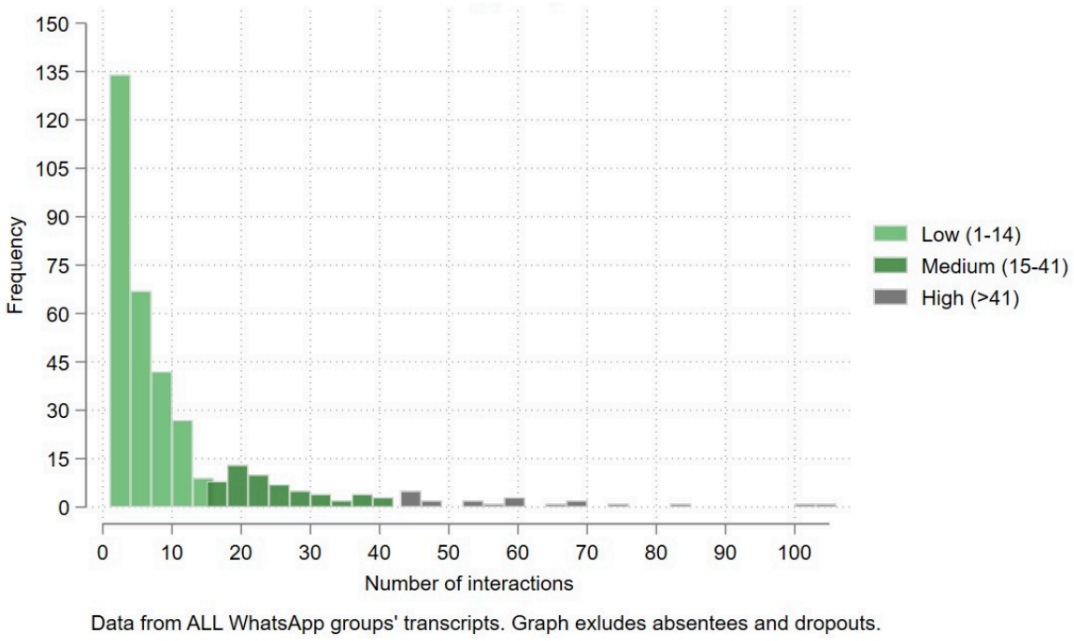

Figure 2: Distribution of the number of interactions by participants

5.2 Engagement with Government Assistance Programs

Our main outcome is the take-up of public benefits, i.e., engagement with the government assistance program. We assess this outcome in two ways: factual knowledge of Portal Ciudadano and behavioral enrollment in the portal. While understanding the portal and registering are initial steps, fully maximizing public benefits necessitates engagement in tasks demanding higher digital literacy. Therefore, we also gauge participants' ability to retrieve online links and find answers to our questions online.

In terms of knowledge, we ask multiple-choice questions about what Sisbén is, procedures they can perform in Portal Ciudadano, and the legal minimum wage in Colombia (without the transportation subsidy). The latter is less directly connected to government assistance programs, but we include it as it is an example of information that is frequently distributed to ensure that migrants are informed about laws relevant to their experience. We code 1 for correct responses and 0 for incorrect responses, and create a sum index as the average of correct responses. Overall, 75.8% of participants were able to respond to at least one of these questions correctly, with only 12.5% accurately responding to all three questions. The treatment arms that combined the data with information have increased participants' factual knowledge about assistance programs, though the effect is strongest and only statistically significant for those who have received this information within WhatsApp groups. The effect is stronger when excluding the question about minimum wage, which is the one that is least clearly connected to the assistance programs.

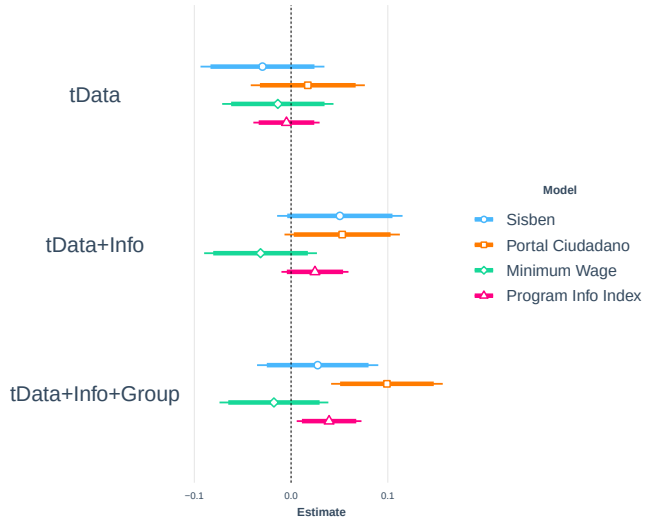

Figure 3: Knowledge about assistance programs

Factual knowledge about existing assistance programs and the portal is important, but arguably the more significant indicator of this knowledge lies in participants' actual enrollment in the portal. None of the participants who took part in this project were registered in Portal Ciudadano at the start of their participation. The DNP merged our participant database with the Portal Ciudadano registry and reported who among our participants had registered and the date they did so. Compared to the control group, receiving information via WhatsApp messages and groups increased the likelihood of registering in this Portal by approximately 25.5% and 26.8%, respectively. Participants in Treatment 1, who received mobile credit for a month but no information, did not show an increase in registration.

This translates to 229 participants signed up participants, compared to 4 participants who signed up during this period without having received the information about the program. This is a very high increase, particularly given the low cost of the intervention.

Taken together, the intervention increased knowledge about the portal and actual enrollment levels. We cannot track what participants do once on the portal, but taking full advantage of the resources it provides requires engaging in tasks that need digital literacy. For that reason, we created a set of measures to empirically evaluate how our treatment

Table 1: Treatment effects on sign-ups for Portal Ciudadano. Included controls for age, gender, education, marriage status and municipality fixed effects.

	Dependent variable:
	Portal Ciudadano Sign-Ups
Data Only	0.120^{***}
	(0.025)
Data+Info	0.328^{***}
	(0.026)
Data+Info+Group	0.271^{***}
	(0.025)
Constant	0.187^{***}
	(0.055)
Observations	1,726
R^2	0.124
Adjusted R^2	0.119
Controls	✓
Note:	*p<0.1; **p<0.05; ***p<0.01

arms affect participants' ability to engage in digitally mediated tasks. We measure this as an outcome rather than a pre-treatment variable as initially planned in our PAP; for other deviations, see Appendix, Section H. Figure 4 illustrates that treated subjects who received data and were also added to WhatsApp groups were significantly more likely to retrieve online information. We asked individuals a set of factual questions and gave them tasks involving retrieving specific URLs. Some link retrieval tasks were related to Sisbén, while others were not, but none were answers or links that we expected many within this group to know off the top of their head (Appendix, Section I).

We find that the third treatment arm caused a significant and sizeable increase in subjects' ability or willingness to complete these tasks, but that neither of the other treatment arms had any effect. This demonstrates that data alone is not the binding constraint on our sample's ability to effectively acquire information online. We see also how digital lit-

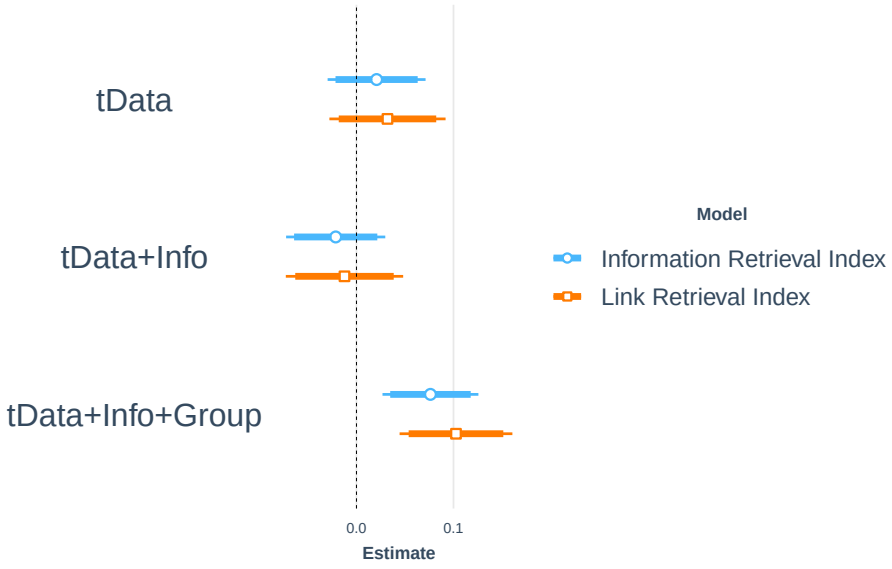

Figure 4: The effects of the intervention on the successful retrieval of online information

eracy operates different in this more networked context. Some participants shared their answers, and others even recorded instructions for others; we describe the implications in the discussion section.

5.3 Secondary Outcomes: Job Market, Government Trust and well-being

Our second hypothesis was that the intervention would have positive effects on employment and training opportunities. This is hypothesized to be partially due to increased access to online opportunities and partially due to the information provided through the assistance programs. Increased employment and training opportunities are also highlighted within assistance programs and integration initiatives. However, these are complex real-world outcomes that are difficult to manipulate with short interventions. For that reason, our outcome survey captures both the outcomes and the effort to obtain job or additional training and education: we ask about the time participants spent working during the past 4 weeks (and subtract that from their baseline response, thereby capturing any increase in the amount of time spent working), the time they spent receiving training or education

during the last month, and whether they made any attempts to find a paid job.

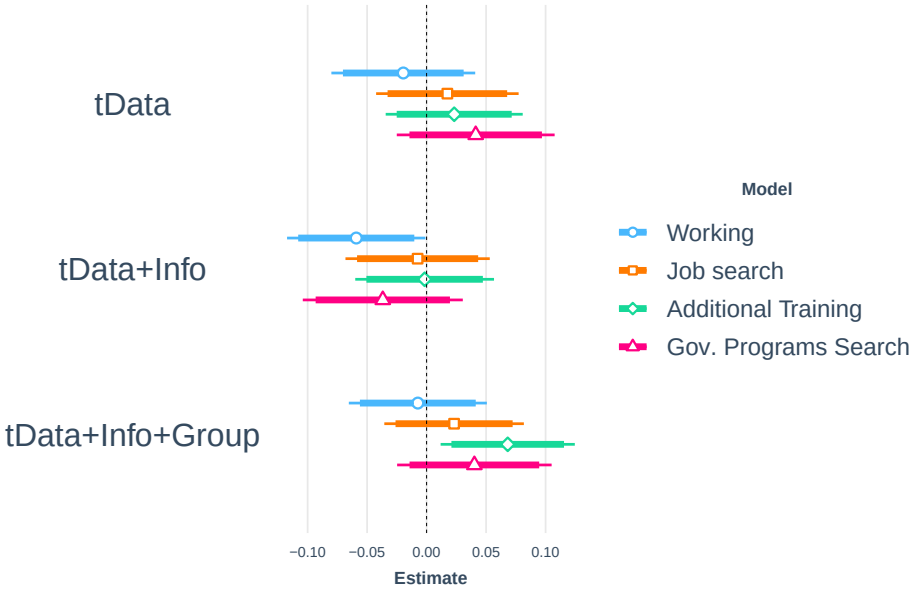

Figure 5: Intervention effects on job, training, and education search

The only significant result we observe is that participants in the second treatment arm ("Data+Info") reported a significant decrease in the time they spent working compared to their baseline, though this effect disappears if we take as the outcome only the time they spent working over the last four weeks. The group in the third treatment arm ("Data+Info+Group") spent significantly more time seeking additional training opportunities. In their open text responses, they mention seeking out courses in English language, cooking, beauty, and cosmetology. It is possible that some of the conversations within WhatsApp groups, particularly when these led to learning about other participants, inspired participants to seek out additional training and search opportunities, though any effect is clearly modest.

We also evaluate the impact of the intervention on attitudes about the government and NGO institutions, focusing on trust in them and interest in the programs they sponsor. We hypothesized that the intervention may signal to participants the commitment of both the government and the NGOs – in this case, IPA associated with the intervention – to migrant well-being and improvement of their life conditions, which could translate into more positive attitudes toward both. Within our sample, approximately 36% of participants report moderate trust in the Colombian government, and 53% report strong or very strong trust. Trust in the international NGOs is even higher, with 30% of participants reporting a moderate level of trust, and 63% reporting strong or very strong trust. Figure 6 shows that the intervention did not affect trust in the government, although it does appear to have increased trust in NGOs among the group that received only mobile credit, without the messages about public service programming. It is possible that the reason why we do not detect effects of the two other treatment arms is because it also reminds individuals of their disappointments with the existing programs and their experiences. In the open text responses, participants report frustration that the help does not arrive to people who need it the most; that the requirements for help are too stringent; or some report lack of clear information on how to get help.

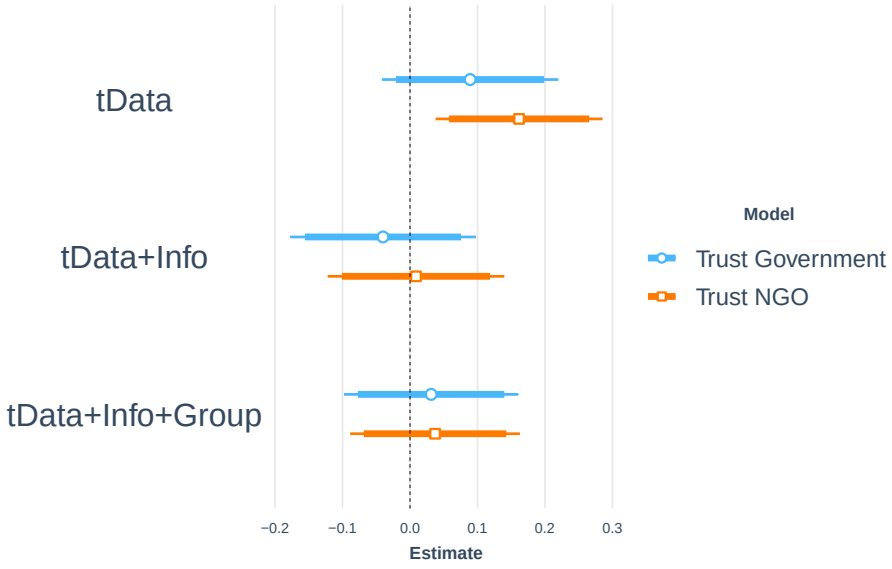

Figure 6: Treatment effects on the trust in institutions

Although we did not find results on trust, Figure 7 shows that participants do report more interest in the government programs, especially among the third treatment arm that received the data and the messages. The first treatment group, with data alone, also shows positive effects on both interest in the government and the NGOs.

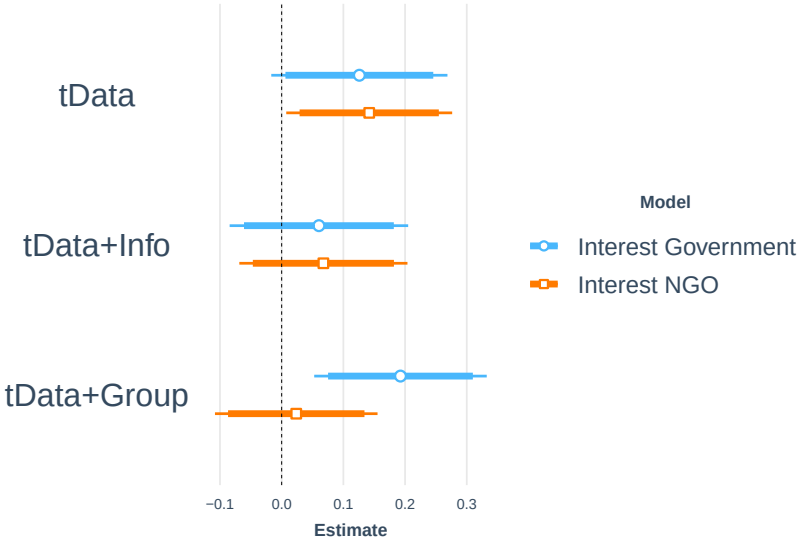

Figure 7: Treatment effects on the interest in institutions

Initially, we anticipated that the intervention might positively influence participant well-being. However, contrary to our expectations, most coefficients are negative, although the effect on the composite well-being index reaches statistical significance only for the second treatment arm. The direction of the effects suggests that those who received the mobile data, regardless of whether they were informed about assistance programs or not, reported feeling more frustrated and less optimistic about the future. Our original framework envisioned the treatment as a means to alleviate the often frustrating barrier faced by participants with limited mobile credit. We hypothesized that the additional support, particularly access to a moderator and the provided messages, could lead to more positive outcomes. However, the findings align more closely with studies suggesting that internet access may heighten anxiety and worry about the future. It is also possible that treated participants were simply frustrated about their monthly unlimited data coming to an end, compared to the control group that was only about to receive it, suggesting that what we are observing could also be associated with the psychological effects of receiving a reward.

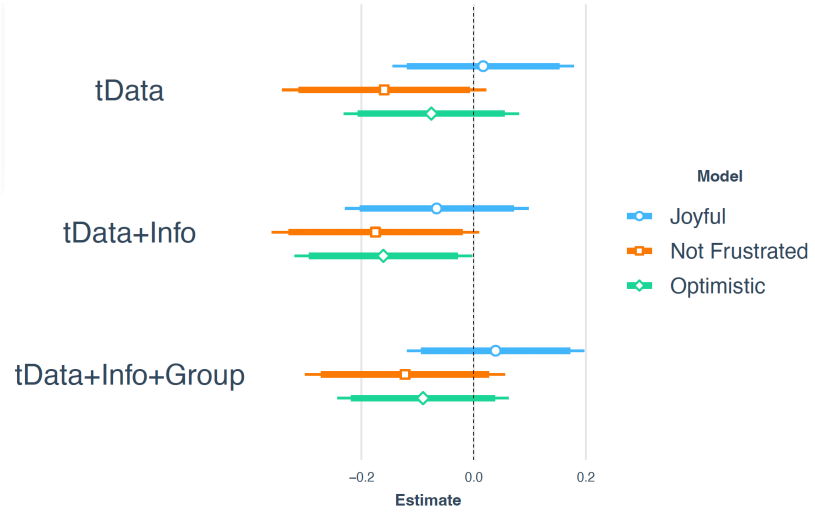

Figure 8: Intervention effects on self-reported well-being

To gain a comprehensive understanding of the effects of our intervention, we also estimated the effects on polarization toward other migrants and the members of the host community. We did not preregister a directional hypothesis. The strongest effect we observe is the effect on attitudes toward Venezuelan migrants in T3, where those who received information and data within WhatsApp groups reported significantly more negative attitudes toward other Venezuelans compared to the control group (β=-0.11 SD, p=0.089). We find two potential explanations particularly compelling: first, that being put in groups may activate within-group competition, especially as the discussions revolve around the distribution of scarce resources; or secondly, that this is driven by the interactions in particular WhatsApp groups. The effect is not robust to the exclusion of outliers.

In the supplementary material, we present two additional types of analysis. First, in section F, we show the results of the impact of receiving unlimited mobile credits (aggregating treatments 1, 2, and 3). Second, in section G, we show the effects between treatments (treatment 2 vs. treatment 1 and treatment 3 vs. treatment 2). Both sets of results are consistent with those presented and discussed in the main document.

5.4 Heterogeneous Effects

There is growing evidence of substantial variability in the effects of digitally mediated treatments by age in the United States and Europe (Munger et al., 2021; Luca et al., 2022; Guess et al., 2019). We explore this heterogeneity, along with education levels, in our study. Our findings reveal a significant negative interaction between age and all treatment arms regarding enrollment in Portal Ciudadano, with older participants exhibiting lower enrollment rates compared to younger ones. Furthermore, we observed a significant negative interaction effect on well-being among older participants in the third treatment arm (β=-0.327, SE=0.118, p=0.006), potentially due to frustration with frequent messaging or digital literacy challenges. Older participants also used unlimited mobile data less frequently for job-related opportunities. In contrast, education level did not significantly

moderate any treatment effects.

Another potential moderator is the date of entry to Colombia, which could reflect selection effects if earlier migrants differ from later ones in meaningful ways. We found that newer migrants (those who entered after 2018) in the third treatment arm were more likely to enroll in Portal Ciudadano (β=0.085, SE=0.05, p=0.092) compared to longer-term residents. The date of entry did not significantly influence other outcomes. Our analysis across different municipalities in Colombia showed no consistent patterns; for instance, there were no significant effects on Portal Ciudadano sign-ups in Medellín and Barranquilla. However, the negative impact on well-being was predominantly in Cali, and adverse attitudes toward Venezuelans were mainly observed in Bogotá D.C. and Medellín.

Regarding WhatsApp group interactions, older individuals with higher levels of engagement were less likely to have Wi-Fi access or be employed. Employed participants tended to send fewer but longer messages, while older participants more frequently used emojis and multimedia. There was a significant correlation between the level of activity and Portal Ciudadano sign-ups (β=0.004, SE=0.001), with sign-up rates increasing with interaction intensity 3% of dropouts signed up, compared to 17% of inactive members, 56% of low-interaction participants, and 64% of those with medium or high levels of interaction. We cannot determine whether higher engagement levels stemmed from pre-existing interest in signing up or if the interaction itself was particularly motivating for enrollment, though we suspect it is the latter.

6 Conclusion

The number of migrants continues to increase, as people leave their home countries either in search of better economic opportunities or as refugees from persecution and violence. Migration profoundly affects both the lives of these individuals and the countries that host them. Equipping these migrants with the necessary tools to thrive in their host communi-

ties is crucial, not only for their well-being but also for the prosperity and stability of their destination countries. Existing research on this issue primarily come from experiences in advanced democracies, despite the fact that most migration occurs outside these areas, in countries already facing strained resources and socio-economic challenges. Therefore, finding cost-effective methods to help migrants navigate their host countries is of utmost importance. In this project, we explore how individuals' ability to access public assistance programs are affected by addressing the informational, data, and network constraints they may encounter.

In collaboration with the *Innovations for Poverty Action* and the *Department of National Planning of Colombia*, we conducted a randomized controlled trial in Colombia focusing on Venezuelan migrants with regularized status, who are eligible for public services in the country. Although these individuals are eligible, they must actively update their information to access these services. To facilitate this process, the government has established the Portal Ciudadano, a one-stop portal where individuals can update their information and access the resources available to them. Participants in our study were not registered for Portal Ciudadano and had limited to no access to mobile data, complicating their ability to fully utilize government resources that are increasingly online and data-intensive. We designed our intervention with three treatment arms: the first provided unlimited data credit; the second added informational messages about social assistance programs over a month; and the third offered access to an informed moderator and a group of 30 other migrants, facilitating peer support and information sharing. To understand the effects of our intervention, we estimated a rich set of outcomes. Our primary focus was on navigational integration, specifically knowledge and enrollment in the program. We also assessed broader integration dimensions: economic, political, and socio-psychological. Specifically, we measured outcomes related to the job market, trust in the government, well-being, and attitudes toward other groups in Colombia.

We found that providing unlimited data access and information alone increased partic-

ipants' enrollment in Portal Ciudadano, with effects even stronger when the information was provided by a moderator and sent directly or within WhatsApp groups. The effects on job market outcomes were limited, although there was some positive increase among the third group in terms of training opportunities. The treated groups consistently reported more interest in government programs, although this did not translate into increased trust in the government as we hypothesized. The only negative effects were on participants' self-reported well-being, with treated groups reporting higher levels of frustration and less optimism. These negative feelings were particularly pronounced among older participants, possibly due to frustration around navigating their online environment, although this is speculative. These findings highlight the importance of considering the abilities of people who are being served by particular resources to take full advantage of them, both in terms of resources and capacities. They also highlight tradeoffs: while information alone can be useful for a number of important outcomes, cultivating networks among migrant populations is likely to be even more impactful.

Our results prove especially encouraging for our most novel treatment condition. We find evidence of the power of even ad hoc groups or "loose-tie" networks for some (but not all) digitally mediated tasks. We incorporated informational retrieval tasks to observe how individuals engage with these tasks with or without access to other participants. Those in the third treatment arm, receiving information within WhatsApp groups, scored significantly higher on their ability to retrieve online information. Anecdotally, participants shared responses in the groups, and one participant even recorded a voice note explaining her approach to the questions. However, it should be noted that the strongest sign-up rate for Portal Ciudadano was among the group that had access to the moderator alone and individual textual messages. This could be due to the additional messages being useful to some, but distracting or annoying to others. Although we did not formally test this mechanism, it is consistent with the the qualitative evidence (Appendix, Section E). Indeed, it can be distracting to be receiving phone notifications about other topics in a group which

also provides useful information. People who were pressed for time or with limited digital literacy might have also stopped paying attention to these groups, or simply missed out on the NGO-provided information, resulting in lower signup rates. At the same time, the ability to ask questions and to have access to an archive of other questions or answers from people facing similar challenges can be invaluable – and the marginal cost, from the policymaker's perspective, is minimal. This is demonstrated in the positive impact of groups in assisting individuals with answering factual questions and retrieving relevant government web links, as well as interest in government programs.

More fundamentally, the goal of integration transcends any one outcome or sign-up. The past two decades have demonstrated the power of digital social networks in every realm of human activity. At a basic theoretical level, migration entails the disruption of existing networks in the country of origin. Our study demonstrates the untapped potential of networks in enhancing the uptake and engagement with public services. We have shown how platforms like WhatsApp, widely used and accessible, can activate these networks and deliver accurate information to hard-to-reach populations. It is crucial to find cost-effective ways to use these platforms for productive content dissemination. There are many possible iterations of our intervention and there are numerous ways it can be adapted for other integration outcomes, presenting a promising avenue for future research. Moreover, our work highlights the power of collaboration – between researchers, government, and the non-governmental sector – to maximize learning and inform policy. Given the complex nature of migration issues, more partnerships are needed to tackle these pressing problems collaboratively.

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Appendices

A Sample Descriptives

General characteristics	N	Mean	SD	Min	Max
Gender (=*1* if female)	1727	0.612	0.487	0	1
Age	1727	37.61	11.26	18.15	96.34
None/Preschool/Elementary	1727	0.148	0.355	0	1
Middle/High School	1727	0.646	0.478	0	1
Technical/Diploma	1727	0.122	0.327	0	1
Under/Post-graduate	1727	0.0845	0.278	0	1
Married/Common-law	1727	0.507	0.500	0	1
Divorced/Separated/Widowed	1727	0.122	0.328	0	1
Single/Never-married	1727	0.357	0.479	0	1
Working (Baseline)	1727	0.364	0.481	0	1
Origin state: Zulia/Carabobo/Lara/Aragua	1727	0.515	0.500	0	1
Origin state: Other	1727	0.485	0.500	0	1
Entry place: Cúcuta	1727	0.325	0.468	0	1
Entry place: Barranquilla/Bogotá/Cali/Medellín	1727	0.603	0.489	0	1
Baseline: Internet use					
Time spent on Facebook (0-4)	1727	2.243	1.158	0	4
Time spent on Instagram (0-4)	1727	0.876	1.151	0	4
Time spent on WhatsApp (0-4)	1726	3.173	0.870	0	4
Time spent on Family and Friends (0-4)	1725	3.051	1.250	0	4
Time spent on non-tech activities (0-4)	1720	2.818	1.474	0	4
Time spent using internet for getting in contact (0-4)	1724	2.916	1.127	0	4
Time spent using internet for reading the news (0-4)	1721	2.291	1.310	0	4
Time spent using internet for entertainment (0-4)	1726	2.539	1.288	0	4
Time spent using internet to look for a job (0-4)	1721	1.848	1.610	0	4
Time spent using internet for help programs (0-4)	1724	1.477	1.434	0	4
Endline: Internet use					
Time spent on Facebook (0-4)	1727	2.382	1.102	0	4
Time spent on Instagram (0-4)	1727	0.997	1.222	0	4
Time spent on WhatsApp (0-4)	1727	3.250	0.832	0	4
Time spent on Family and Friends (0-4)	1727	3.175	1.193	0	4
Time spent on non-tech activities (0-4)	1725	2.613	1.449	0	4
Time spent using internet for getting in contact (0-4)	1726	2.979	1.099	0	4
Time spent using internet for reading the news (0-4)	1727	2.247	1.319	0	4
Time spent using internet for entertainment (0-4)	1725	2.590	1.238	0	4
Time spent using internet to look for a job (0-4)	1725	1.977	1.582	0	4
Time spent using internet for help programs (0-4)	1722	1.463	1.401	0	4
Most used webpages/apps					
News	1685	0.027	0.161	0	1
Other	1686	0.080	0.280	0	1
None/Blank	1686	0.163	0.370	0	1
Government, NGOs, training, job, health, etc.	1724	0.115	0.320	0	1
Social media	1724	0.658	0.474	0	1

Table A.1: Descriptive characteristics

B Baseline Characteristics

Table 2 demonstrates that the baseline characteristics across the four treatment arms are largely balanced.

Table B.1: Baseline Characteristics

Characteristic	Treatment 1	Treatment 2	Treatment 3	Total	Control	T-Test
Female	0.617	0.596	0.627	0.614	0.606	0.016
	(0.024)	(0.024)	(0.023)			
Age	37.824	37.526	37.485	37.609	37.631	−0.002
	(0.553)	(0.563)	(0.528)			
Married/Cohabit	0.499	0.507	0.519	0.509	0.505	0.008
	(0.024)	(0.025)	(0.023)			
Time on Facebook	4.258	4.246	4.233	4.245	4.238	0.007
	(0.057)	(0.057)	(0.054)			
Time on WhatsApp	5.189	5.144	5.192	5.176	5.163	0.014
	(0.041)	(0.046)	(0.037)			
Data Usage: News	4.355	4.350	4.255	4.318	4.176	0.108*
	(0.065)	(0.064)	(0.059)			
Data Usage: Job Search	3.740	3.868	3.873	3.827	3.909	−0.051
	(0.080)	(0.079)	(0.074)			
Data Usage: Communication	4.920	4.953	4.898	4.922	4.898	0.021
	(0.056)	(0.054)	(0.051)			

Note: The value displayed for t-tests are the differences in the means across the groups. ***, **, and * indicate significance at the 1, 5, and 10 percent levels, respectively.

Finally, attrition rate considering all surveys sent (2156) was 19.9%. Please see Appendix B for the attrition analysis.

C Implementation Details

We describe the details of the intervention below, i.e. the information about the treatment conditions, timing of the activities, mobile credits, messages, and WhatsApp groups.

C.1 Timeline

The intervention was carried out from August to October 2023 as summarized in Figure C.1 . After the screening process, the baseline survey was implemented before participants received data phone credits or information. Participants in T1, T2, and T3 received data recharges at different times in the first weeks of the intervention, depending on the phone operator they use. Between September 15 and October 15, participants in T2 and T3 received information about Sisbén and Portal Ciudadano through WhatsApp messages individually or in groups, respectively. The endline survey was implemented roughly a month after the baseline. Participants in the control conditions received phone data recharges and information weeks after the collection of the endline survey.

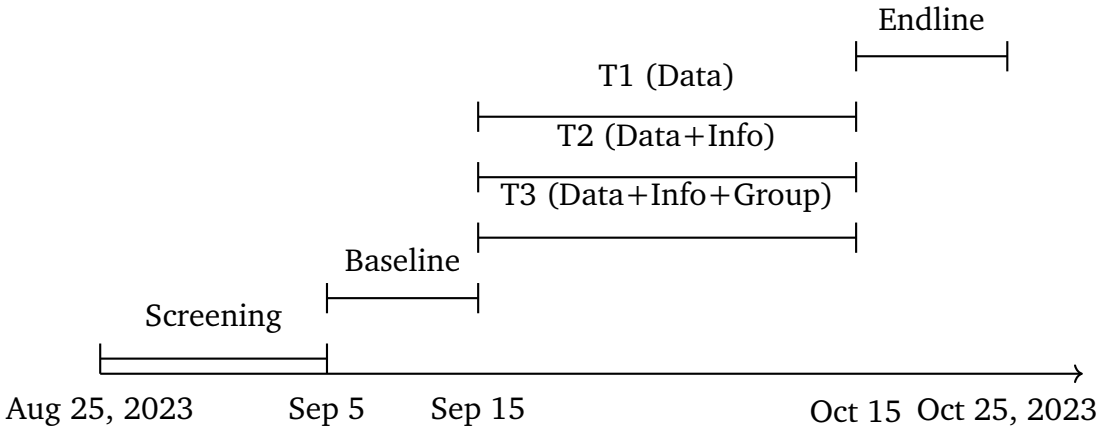

Figure C.1: Timeline

C.2 Internet Access

We ended up sending 3030 baseline surveys, and obtained 2156 complete surveys. 64.6% of these participants reported having no mobile internet.

C.2.1 Mobile credits

Mobile data credits were distributed among participants across three treatment conditions. Over 90% of participants used one of the three major operators in the country: Claro, Tigo, and Movistar.

Access to internet		Wi Fi		
		Yes	*No*	*TOTAL*
Mobile Internet	*No Plan*	26.3%	38.2%	**64.6%**
	1-5 GB	07.2%	13.2%	20.4%
	5-10 GB	05.3%	09.7%	15.0%
	TOTAL	38.9%	**61.1%**	100% *(2,156)*

Figure C.2: Participant mobile plans

C.2.2 Messages

A set of WhatsApp messages was sent by IPA using Twilio, throughout the four weeks of the intervention. The following list shows the content and date of each message.

1. Hello [name]. We are IPA Colombia. Did you know that the Sisbén survey makes you visible for potential benefits of social programs? Request this survey through the Sisbén Citizen Portal. If you already have your Sisbén survey, you can check the information through the Citizen Portal.

2. Did you know that Sisbén has a virtual assistance channel? Get to know the Citizen Portal, register, and request your survey. If you already have your survey, you can check your information. Please note that being registered on the portal is not the same as being registered in the Sisbén database. Make sure you have the survey done at your home and have your Sisbén classification.

3. Click on the following link to watch a video and learn about Sisbén: bit.ly/3Rp32iD.

4. Hello [name]. We are IPA Colombia. Take advantage of the benefits of the Sisbén Citizen Portal, which is a website where you can carry out various procedures related to Sisbén quickly, free of charge, and without the need to go to any office. All you have to do is register on the portal and you're done.

5. If you have children under 6 years old who were not registered in your Sisbén survey, you can easily and quickly include them through the Sisbén Citizen Portal. Register at https://portalciudadano.Sisbén.gov.co/.

6. Click on the following link to watch a video and learn about the Sisbén Citizen Portal: http://bit.ly/3r3r0p6.

7. Hello again [name]. We are IPA Colombia. Remember that the Sisbén survey makes you visible for potential benefits of social programs. Request this survey through the Sisbén Citizen Portal. If you already have your Sisbén survey, you can check the information through the Citizen Portal.

8. Click on the following link to watch a video and learn about Sisbén: https://bit.ly/3r9Lz39.

9. Now you can access your Sisbén information from the Citizen Portal. Register on the Sisbén virtual assistance channel and download your household form quickly and for free. Visit https://portalciudadano.Sisbén.gov.co/.

10. We are IPA Colombia! Click on the following link to watch a video and learn about how Sisbén is used to select beneficiaries for social programs: https://bit.ly/3EE8NRT.

11. If you already have the Sisbén classification, use the Citizen Portal to see the information recorded in your survey. Visit https://portalciudadano.Sisbén.gov.co/.

12. Remember that the Sisbén survey makes you visible for potential benefits of social programs. Request this survey through the Sisbén Citizen Portal. If you already have your Sisbén survey, you can check the information through the Citizen Portal.

C.2.3 WhatsApp Groups

Participants in the third treatment condition were divided into 18 groups of approximately 30 participants. For assignment to WhatsApp groups, stratified randomization was carried out, considering characteristics such as gender, age and educational level, providing statistical balance among the eighteen groups.

To manage this intervention, IPA hired a moderator and qualitative analyst, who was responsible for sending a set of three messages weekly to each of the Whatsapp groups, which were the same messages sent to the Treatment 2 participants. The moderator was trained by the National Planning Department to be able to accurately respond to participants inquiries on the topic throughout the intervention.

Participants were allowed and encouraged to ask questions and interact around the information sent by the moderator. Also, participants were allowed to spontaneously interact between them, as long as there was no hateful speech involved. Besides sending the weekly messages and specifically responding to questions from the participants, the moderator kept a passive role in the group, as to allow for spontaneous and free interaction among the participants.

Overall, participants and the moderator shared 4843 messages in the 18 Whatsapp groups throughout the four weeks of the intervention, and the total interactions across Whatsapp groups ranged from 35 to 635.

D Attrition

Attrition rate considering all surveys sent (2156) was 19.9%.

E WhatsApp Interactions

Example of interactions from proactive users:

Table D.1: Endline survey results

	Control	Data	Data & Info	Data & Info & Groups	Total
Surveys sent	562	525	526	543	2156
Complete surveys	442	423	403	459	1727
Survey rate (% surveys sent)	78.6%	80.6%	76.6%	84.5%	80.10%

Variable	N	*age*	*gender (1 = female)*	Education level			
				Preschool-Elementary	*Middle/High School*	*Technical - Diploma*	*Under/Post-graduate*
Total sample	543	37,3	0,61	0,14	0,64	0,10	0,12
Group 1	30	35,8	0,69	0,12	0,73	0,08	0,08
Group 2	31	37,0	0,63	0,25	0,54	0,13	0,08
Group 3	30	38,2	0,67	0,17	0,50	0,11	0,22
Group 4	30	37,1	0,62	0,05	0,76	0,19	0,00
Group 5	30	35,1	0,63	0,06	0,56	0,25	0,13
Group 6	30	36,9	0,67	0,11	0,89	0,00	0,00
Group 7	31	41,2	0,68	0,18	0,59	0,05	0,18
Group 8	30	41,2	0,63	0,21	0,63	0,17	0,00
Group 9	30	36,7	0,56	0,22	0,56	0,17	0,06
Group 10	30	37,8	0,65	0,17	0,74	0,00	0,09
Group 11	30	38,5	0,60	0,16	0,68	0,08	0,08
Group 12	30	39,5	0,61	0,04	0,74	0,13	0,09
Group 13	30	36,3	0,55	0,30	0,60	0,05	0,05
Group 14	30	34,5	0,57	0,17	0,48	0,04	0,30
Group 15	30	37,0	0,61	0,06	0,78	0,06	0,11
Group 16	30	45,6	0,63	0,25	0,69	0,00	0,06
Group 17	31	38,2	0,75	0,05	0,60	0,15	0,20
Group 18	30	35,7	0,56	0,24	0,72	0,04	0,00

Figure E.1: Participant characteristics in groups

```
''Hi, I am G14-P63828. I am from Cabimas, State of Zulia.
Happy day to the whole group. And I am here in Cucuta.
I have been here for five years. Likewise, she is a user who usually greets:
Happy day to all; God bless you pleasantly. And she asks when he sees it necessary:
I also tried (referring to entering the Citizen Portal),
and it does not open the page; what do we do?"

"Stop arguing and talking unnecessary things, this group was
created in order to give (INFORMATION) only for this purpose. Thank you'".
```

E.1 Intervention

These types of questions are related to the intervention and the study, such as: What is the purpose of the WhatsApp groups? What information will they be given in the groups? When will the following survey be? Likewise, the questions about the intervention also concern mobile data top-ups, and the raffle announced at the beginning of the interven-

tion. Some textual examples of the above are below:

G15-P37876: "I have a question: what will we do in this group?
Just receive information, and that is it? Isn't it necessary to answer?"

601-P63479: "When do the surveys start? Good morning."

G03-P24593: "Finally, when is the bonus draw?"

E.2 Sisbén

This type of interaction can be grouped into two large groups around the information that people request. First, questions about the system regarding family or personal issues. Among these are:

E.3 Inclusion of new household members to the Sisbén survey

Requests to add people to their households survey, such as children, mother, partner, siblings, and mother-in-law. For example:

G14-P26481: "Hello, good afternoon. In my case, they visited me and did the survey, but at that time, my son did not have PPT and did not register him.
What should I do now?"

E.4 Exclusion of a household member from the survey

Doubts about how they could remove a former family member from their Sisbén survey due to household breakdown or separation.

G12-P26080: "Good afternoon, my Venezuelan daughter had two children here; they are nationals; she has been in Sisbén since 2019 when she still lived with the children's father, and she is the one who appears as the head of the household, she has requested exclusion a couple of times to make another survey for her and the two children, but it has not been possible because they tell her that the man must request it and he does not live in this State, how would she do it in that case?"

E.5 Change of address

Questions about updating their address in the Sisbén survey due to changes in their residence.

G06-P61688: I am already registered in the Citizen Portal and my Sisbén appears in Cali, how do I change the address? I am in Medellín.

E.6 Status of household members in the survey

Questions about why some household members appear with alert, verification or review comments within the citizen portal as shown below:

G03-P10221: "Hello, good morning. My eldest son has a Colombian civil registry, and I got a red alert in Sisbén for documents. How could I update that data?"

E.7 Access to Social Programs

This branch of questions were related to how to apply to social programs. It also includes complaints about not receiving social aid despite being in Sisbén (for example, the Ingreso Solidario cash transfer). This is related to the notion that Sisbén enables other government aid, which responds to targeting criteria.

G18-P49017: "I have Sisbén in extreme poverty, and they have not given me any help. That is no longer due to high or low scores; I believe it was due to luck now. That is why they give it to those who do not need it."

E.8 Customer Service

This type of question relates to problems about registering or interacting with the Citizen Portal. For example:

G04-P17368: User sent a screenshot showing that he entered the data incorrectly to register; however, he asked for help.

E.9 Miscellaneous Requests

Finally, to a lesser extent, there are additional three types sent by users directly to the moderator through group chats or private messages, and not categorized in any of the previous four themes:

E.10 Help to Get a Job

Comments that manifested unemployment situations as shown below:

G02-P32362: "Good afternoon, excuse me for being bold, it is urgent,
do you by chance not know of a job here in Cucuta?
I'm desperate; I would appreciate it."

E.11 Support to Understand the Sisbén Information Being Sent

Requests to explain the messages of the intervention in a simpler way:

```
G18-P15519: "I really would like you to help me more; I have to ask for help
to fill out all those things that they sometimes ask for because I do not know how
to do it, I do not know how to read well or write well.
I have a hard time understanding many words and how they are said. Thank you".
```

E.12 Add New Members to a WhatsApp Group

Requests to add a family member to the WhatsApp group where they are part:

```
G10-P43590: Hello, please add this phone number in the IPA group [...].
The man wants to participate; he is Venezuelan.
A question: What can I do or what do I have to do to seek help?
```

F Aggregated impact of unlimited mobile credit

In this section, we present the results by aggregating all individuals who received unlimited mobile credit. As we can see, registration levels are higher as a result of the intervention, but well-being indicators declined. Additionally, as we discuss extensively in the text, we find no detectable impact of the intervention on job market outcomes or levels of trust.

Table F.1: Aggregated Results – Registration Portal Ciudadano

	Dependent variable:
	Registration PC
Binary Treatment	0.080^{***}
	(0.022)
Observations	1,726
R^2	0.029
Adjusted R^2	0.024
Note:	*p<0.1; **p<0.05; ***p<0.01

Table F.2: Aggregated Results – Knowledge about existing assistance programs

	Dependent variable:			
	Sisbén	Portal Ciudadano	Minimum Wage	Knowledge Index
	(1)	(2)	(3)	(4)
Binary Treatment	0.016	0.058**	−0.021	0.020
	(0.026)	(0.024)	(0.024)	(0.014)
Observations	1,725	1,714	1,719	1,707
R^2	0.042	0.012	0.016	0.023
Adjusted R^2	0.037	0.006	0.010	0.018
Note:				*p<0.1; **p<0.05; ***p<0.01

Table F.3: Aggregated Results – Job Market Outcomes

	Dependent variable:			
	Working	Look Job	Additional Training	Gov. Programs
	(1)	(2)	(3)	(4)
Binary Treatment	−0.013	0.012	0.032	0.017
	(0.025)	(0.025)	(0.024)	(0.027)
Observations	1,726	1,725	1,725	1,723
R^2	0.096	0.010	0.016	0.014
Adjusted R^2	0.091	0.005	0.011	0.009
Note:				*p<0.1; **p<0.05; ***p<0.01

Table F.4: Aggregated Results – Trust in Host Government

	Dependent variable:	
	Trust Government	
	(1)	(2)
Binary Treatment	0.028	0.028
	(0.056)	(0.056)
Observations	1,719	1,719
R^2	0.009	0.009
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table F.5: Aggregated Results – Well-being

	Dependent variable:		
	Joyful	Not Frustrated	Optimistic
	(1)	(2)	(3)
Binary Treatment	-0.001	-0.151^{**}	-0.108^{*}
	(0.067)	(0.075)	(0.064)
Observations	1,723	1,720	1,726
R^2	0.016	0.009	0.011
Adjusted R^2	0.011	0.003	0.005
Note:			*p<0.1; **p<0.05; ***p<0.01

G Comparison of the Effects Across Treatment Arms

The first set of columns in each table compares the Information Treatment to the group that received only phone data; the second set of columns compares the WhatsApp Groups Treatment to those who received information about the program individually.

Table G.1: Differences Between Treatment – Knowledge

	Dependent variable:			
	SSN Know Index	Link Index	SSN Know Index	Link Index
	(1)	(2)	(3)	(4)
Info Treatment	0.037^{**}	0.018		
	(0.016)	(0.026)		
Group Treatment			0.015	0.117^{***}
			(0.018)	(0.030)
Observations	1,271	1,165	853	787
Sample	Received Phone Data		Received Data + Info	
Note:				*p<0.1; **p<0.05; ***p<0.01

Table G.2: Differences Between Treatment – Job Market

	Working	Look Job	Training	Gov. Prog	Working	Look Job	Training	Gov. Prog
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Info Treatment	-0.012	-0.008	0.013	-0.038				
	(0.027)	(0.027)	(0.026)	(0.030)				
Group Treatment					0.001	0.031	0.071^{**}	0.078^{**}
					(0.032)	(0.031)	(0.030)	(0.034)
Observations	1,284	1,283	1,283	1,282	861	860	860	859
Sample		Received Phone Data				Received Data + Info		

Note: *p<0.1; **p<0.05; ***p<0.01

Table G.3: Differences Between Treatment – Trust

	Dependent variable:			
	Trust Gov	Trust NGO	Trust Gov	Trust NGO
	(1)	(2)	(3)	(4)
Info Treatment	-0.092	-0.137^{**}		
	(0.061)	(0.057)		
Group Treatment			0.067	0.023
			(0.071)	(0.067)
Observations	1,278	1,280	856	857
Sample	Received Phone Data		Received Data + Info	

Note: *p<0.1; **p<0.05; ***p<0.01

Table G.4: Differences Between Treatment PC

	Dependent variable:	
	Registration	
	(1)	(2)
Info Treatment	0.238^{***}	
	(0.021)	
Group Treatment		0.052^{**}
		(0.025)
Observations	1,726	1,303

Note: *p<0.1; **p<0.05; ***p<0.01

Table G.5: Differences Between Treatment – Wellbeing

	Dependent variable:					
	Joyful	Not frustrated	Optimistic	Joyful	Not frustrated	Optimistic
	(1)	(2)	(3)	(4)	(5)	(6)
Info Treatment	-0.026	0.014	-0.045			
	(0.073)	(0.082)	(0.070)			
Group Treatment				0.109	0.052	0.074
				(0.083)	(0.095)	(0.082)
Observations	1,283	1,279	1,284	861	856	861
Sample	Received Phone Data			Received Data + Info		
Note:						*p<0.1; **p<0.05; ***p<0.01

H Pre-Registered Hypotheses and Tests

We filed our pre-registration in August 2023. All the analyses proposed in the pre-analysis plan are tested in the main paper or in the Appendix. The main difference with respect to the pre-analysis plan is that we did not pre-register the behavioral outcome - registrations in Portal Ciudadano because we did not believe that we would have access to that data at the time of pre-registration. We pre-registered the expectation that the treatment would lead to the increase of knowledge about the portal, and the actual enrollment is a behavioral measure of that test.

In the main paper, we focus on the disaggregated results for each of the treatment arms rather than aggregating all individuals who received unlimited mobile credit (data, information, and group treatments). We believe that disaggregating the results allows for a more nuanced understanding of the interventions and provides deeper insights into their effects. In this particular case, it better reflects what we learn about these types of interventions through the way we distribute information. Nonetheless, the aggregated results are presented in the Appendix for reference, and both sets of results are consistent. We do not find support for all of our expectations from the pre-registration, which we note in the text.

Finally, we did not examine whether the ability to detect misinformation moderates the effects, as we did not end up including a measure of digital literacy in our baseline survey. Collaborations like ours, involving government agencies, researchers, and NGOs, often require adaptability. We made this change for two reasons: firstly, upon learning that we would have access to data on enrollment in the citizen portal, we recognized the importance of understanding participants' ability to engage in tasks demanding higher digital literacy skills. This led us to focus on capturing the full extent of their interaction with the portal and evaluate the ability to complete digitally mediated tasks (digital literacy) as an outcome rather than a moderator. Second, we had to reduce the number of questions in the baseline for logistical and implementation reasons and decided to make this change to maximize the insights we can gain from the project.

I Instruments

Screening Questions

Variable name	Question [ENG]
welcome	Hello! We are Innovations for Poverty Action Colombia, Colombia. Sisbén shared your contact information with us to invite you to participate in a survey for an Innovations for Poverty Action Colombia, study. If you end up taking part in this study, you will receive an internet top-up to your cell phone and you will be entered in a raffle for a market voucher worth 200,000 COP. In addition, we will contact the winners in two weeks and announce the results to all participants. In order to participate and answer these questions correctly, please read the instructions carefully and answer with the number associated with your answer for the single-choice questions.
verif_1	Are you [name]? Answer: - 1: if YES, it is you - 0: if NO
verif_reminder	It's been a while, we want to know if we are communicating with [name].
verif_2	Do you know [name]? What is the relationship between the owner of this cell phone and [name]?
verif_3	Is this the best phone number to contact [name]?
verif_dob_1	To validate that we are communicating with you, [name], please enter your year of birth. Sisbén provided us with this information, so we will validate your identity with your year and month of birth. Please enter below only the year in which you were born, in numbers, without periods (.) or commas (,). For example: 1990.

Baseline Survey

Variable name	Question [ENG]
welcome	Hello again [name]! We are Innovations for Poverty Action Colombia, Colombia. Considering that you agreed to participate in the study of access to information on social programs for Venezuelans in Colombia, we will ask you a few questions that will take you no more than XX minutes to answer, if you agree to continue participating in the study. You will receive an internet top-up to your cell phone, and you will be entered in a raffle for a market voucher worth 200,000 COP. In addition, we will contact the winners in two weeks and announce the results to all participants.
education_st	What is the highest level of education you completed?
marital_st	What is your current marital status?
employment_st	In which activity did you spend the most time last week?
state_ven	In which state of Venezuela did you reside before moving to Colombia? (if you have lived in more than one, please answer with the one you lived in the longest)
place_entry	What was the first place of residence in Colombia to which you arrived when you immigrated from Venezuela?
place_entry_o	Can you please specify the first place of residence in Colombia to which you arrived when you immigrated from Venezuela? Answer only with the name of the city or municipality in Colombia.
time_fb	On average, how much time do you spend on Facebook during a typical week?
time_ig	On average, how much time do you spend on Instagram during a typical week?
time_wa	On average, how much time do you spend on WhatsApp during a typical week?
time_ff	On average, how much time do you spend on Family and friends (offline) during a typical week?
time_nt	On average, how much time do you spend on Non-tech activities during a typical week?
1_internet_use	How much do you use the internet to stay in touch with friends and family?
2_internet_use	How much do you use the internet to read the news?
3_internet_use	How much do you use the internet for entertainment?
4_internet_use	How much do you use the internet to look for paid jobs?
5_internet_use	How much do you use the internet to look for government or other assistance programs?
education_st	What is the highest level of education you completed?
marital_st	What is your current marital status?
employment_st	In which activity did you spend the most time last week? Answers: working; job searching; studying; own household chores/caregiver in the household; permanently unable to work; pensioned/retired; other activity; no answer (omit)
state_ven	In which state of Venezuela did you reside before moving to Colombia? (if you have lived in more than one, please answer with the one you lived in the longest)
place_entry	What was the first place of residence in Colombia to which you arrived when you immigrated from Venezuela?

Endline Survey

Variable name	Question [ENG]
welcome	Hello again [name]! We are Innovations for Poverty Action Colombia. Considering that you agreed to participate in the study of access to information on social programs for Venezuelans in Colombia, we will ask you a few questions that will take you no more than 20 minutes to answer, if you agree to continue participating in the study. You will receive an internet top-up to your cell phone and you will be entered in a raffle for a market voucher worth 200,000 COP. In addition, we will contact the winners in two weeks and announce the results to all participants.
verif_1	Are you [name]?
Consent	[name], we would like to invite you to continue participating in the next stages of the study whose objective is to improve access to information on social programs for Venezuelans in Colombia. The next stages of the study include XX and YY [Here should go what these stages of the study are in terms of messages and surveys that will be sent to the participant]. We will send you these surveys and messages within the next month. By participating, you will be eligible for other bonus raffles. By taking part in this survey you will participate in the raffle of a market bonus, worth 200,000 Colombian pesos. We will contact the winners in two weeks and announce to all participants the results. You may stop answering at any time, or skip any question you do not wish to answer by typing 77, or omit, and you will not be affected. All of your information will be encrypted to be protected. For more information about this informed consent, please click on this link: [Baseline consent link]
1_program	What is Sisbén? Answer: - 1 if a health insurance - 2 if a socioeconomic assistance agency - 3 if it is a socio-economic characterization survey - 4 don't know - 5 no answer (omit)
2_program	Portal ciudadano provides information about the Sisbén, do you know which procedures you can perform in the Portal ciudadano? Answer: - 1 if requesting and following up on the Sisbén survey - 2 if Requesting prioritization for subsidies - 3 if Affiliation to the health system - 4 if All of the above - 5 if None of the above - 99 Don't know - 77 No answer (omit)
3_program	How much is the minimum wage in Colombia (without transportation subsidy) for 2023? Answer: - 1 1,300,000 COP per month - 2 1,000,000 COP per month - 3 960,000 COP per month - 4 1,160,000 COP per month - 99 Don't know - 77 No answer (omit)

Variable name	Question [ENG]
1_interest	How much interest do you have in migrant assistance programs provided by the Colombian government? Answer: - 1 if Very strong interest - 2 if Strong interest - 3 if Moderate interest - 4 if Low interest - 5 if No interest - 99 Don't know - 77 No answer (omit)
1_interest$_spec$	Can you please specify why you have little or no interest in the Colombian government's migrant assistance programs?
2_interest	How much interest do you have in migrant assistance programs provided by international NGOs? Answer: - 1 if Very strong interest - 2 if Strong interest - 3 if Moderate interest - 4 if Low interest - 5 if No interest - 99 Don't know - 77 No answer (omit)
2_interest_spec	Can you please specify why you have little or no interest in the international NGOs' migrant assistance programs?
1_trust	How much do you trust the Colombian government to do what is right for Venezuelan migrants? Answer: - 1 if Very strong trust - 2 if Strong trust - 3 if Moderate interest - 4 if Low trust - 5 if No trust - 99 Don't know - 77 No answer (omit)
1_trust_spec	Can you please specify why you have little or no interest in the Colombian government's migrant assistance programs?
2_trust	How much do you trust international organizations to do what is right for Venezuelan migrants? Answer: - 1 if Very strong trust - 2 if Strong trust - 3 if Moderate interest - 4 if Low trust - 5 if No trust - 99 Don't know - 77 No answer (omit)

Variable name	Question [ENG]
2_trust_spec	Can you please specify why you have little or no interest in the international NGOs' migrant assistance programs?
1_retrieve	Who is the Prime Minister of Japan?
2_retrieve	What is the tallest mountain in North America?
3_retrieve	What car brand had the most sales in the world last year?
1_link	Send us the webpage of the Colombian Ministry of Health.
2_link	Send us the official webpage of the Sisbén.
3_link	Send us the official webpage of the FC Barcelona.
rumor_vc	True or false. Sisbén will guarantee you access to all the government aids and social programs.
employment_st	In which activity did you spend the most time last week? Answer: - 1 Working - 2 Job searching - 3 Studying - 4 Own household chores/caregiver in the household - 5 Permanently unable to work - 6 Pensioned/retired - 66 Other activity - 77 No answer (omit)
1_find_job	During the past 4 weeks have you tried in any way to find a paid job?
2_find_job	How successful were these attempts? Answer: - 1 if I did not find a job - 2 if I did not find a job yet, but found some potential opportunities - 3 if I am in the process of interviewing - 4 if I found a job - 77 No answer (omit)
1_r_training	Compared to previous months, have you tried to receive any additional training or education during the last month?
2_r_training	Can you please give examples or specify additional training or education you have received (or have attempted to receive) during the last month.
3_r_training	Is there a specific reason why you do not want, or are not seeking, additional training or education?
1_a_programs	Have you tried seeking government assistance programs for the past 4 weeks?
1_wellb	Over the past 30 days, how often have you felt: satisfied, joyful, fulfilled, or happy? Answer: - 1 if Much more than before - 2 if More than before - 3 if Same as before - 4 if Less than before - 5 if Much less than before - 99 Don't know - 77 No answer (omit)

Variable name	Question [ENG]
2_wellb	Over the past 30 days, how often have you felt: frustrated, nervous, bored, or lonely? Answer: - 1 if Much more than before - 2 if More than before - 3 if Same as before - 4 if Less than before - 5 if Much less than before - 99 Don't know - 77 No answer (omit)
3_wellb	Over the past 30 days, how optimistic have you been feeling about the future? Answers: - 1 if Much more than before - 2 if More than before - 3 if Same as before - 4 if Less than before - 5 if Much less than before - 99 Don't know - 77 No answer (omit)
meta_stereo	How do you think Colombian citizens perceive Venezuelan migrants? Answer: - 1 if Very positively - 2 if Positively - 3 if Neither positively nor negatively - 4 if Negatively - 5 if Very negatively - 99 Don't know - 77 No answer (omit)
1_polariz_scale	How do you feel about Venezuelans in Colombia? Please answer only with a number between a scale of 1 - 100 (with 0 being negative/cold and 100 positive/warm).
2_polariz_scale	How do you feel about Colombians in Colombia?Please answer only with a number between a scale of 1 - 100 (with 0 being negative/cold and 100 positive/warm).
app_internet	Over the last 4 weeks, what websites/apps do you visit online most frequently? Please respond, in a single brief message, with the names of the websites or apps you visit the most.
time_fb	On average, how much time do you spend on Facebook over the last 4 weeks?
time_ig	On average, how much time do you spend on Instagram over the last 4 weeks?
time_wa	On average, how much time do you spend on WhatsApp over the last 4 weeks?
time_ff	On average, how much time do you spend on Family and friends (offline) over the last 4 weeks?
time_nt	On average, how much time do you spend on Non-tech activities over the last 4 weeks?
1_internet_use	How much do you use the internet to stay in touch with friends and family over the last 4 weeks?
2_internet_use	How much do you use the internet to read the news over the last 4 weeks?
3_internet_use	How much do you use the internet for entertainment over the last 4 weeks?
4_internet_use	How much do you use the internet to look for paid jobs over the last 4 weeks?
5_internet_use	How much do you use the internet to look for government or other assistance programs over the last 4 weeks?

I.1 Additional Outcomes

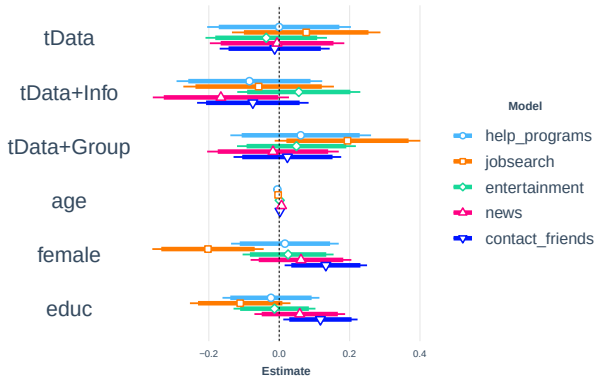

Figure I.1: Categories of What Social Media Is Used for Before and After Treatment

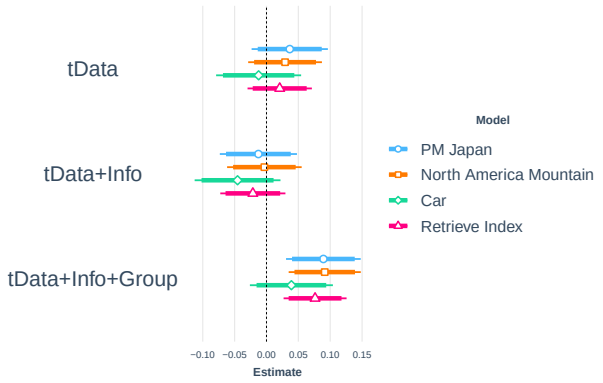

Figure I.2: Treatment effects on Information Retrieval

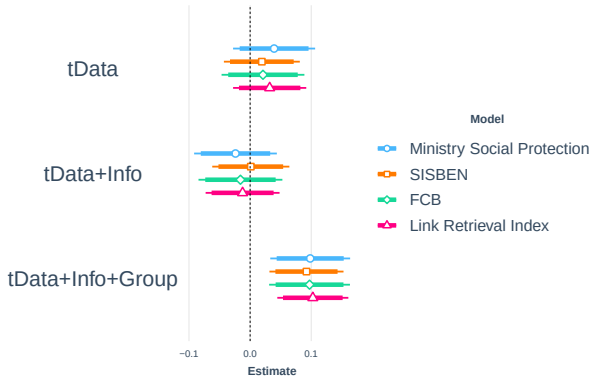

Figure I.3: Treatment effects on Link Retrieval