Financial Inclusion and Confidence

Abstract

Financial inclusion is the availability of financial resources, including transactions, payments, savings, credit and insurance, and equal opportunities to access these financial services. However, despite the growing usage of digital payments, many people in India continue to prefer cash-based transactions due to various factors, one of which is likely the low confidence level in navigating the payment apps or the smartphone itself. Here, in a lab-in-the-field experiment, we plan to test simple video interventions targeted at smartphone users to perform a QR code transaction. They are asked to practise the transaction while watching the video to learn the task step-by-step.

Introduction

The World Bank defines financial inclusion as individuals and businesses having access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered responsibly and sustainably. It refers to a process by which individuals and businesses can access appropriate, affordable, and timely financial products and services.

According to a recent report by the India Brand Equity Foundation (an initiative undertaken by the Ministry of Commerce and Industry), as of October 2021, India has around 1.18 billion mobile connections, 700 million Internet users, and approximately 600 million smartphones. In 2020 alone, India had about 25.5 billion real-time online payment transactions, and the numbers are expected to keep growing. However, piecing together available data from the supply and demand sides, the Centre for Global Development finds that as of 2018, the proportion of Indian adults who have ever made or received a digital payment is 35 per cent. Almost two-thirds of adults are not yet included in India's digital finance ecosystem. While on paper, there may be many more UPI accounts, many of which are dormant and used only once.

CGAP's report on M-PESA usage in Kenya found several benefits to using this digital payments app: it can be a useful way to receive or send money when banks are closed and save a trip to the bank. Digital payments also enable transactions online without the need to keep or store cash at home or in person. Online cash transactions have also benefited rural women dependent on their husbands (who work as migrant workers in cities) to receive cash faster. Therefore, the adoption of digital financial services could have a positive impact on people's lives.

Its face value suggests that digital transactions are costless, but it requires an active bank account, a smartphone, internet access, digital literacy, and financial know-how. Thus, such a transaction is hardly free of cost. Two further reasons behind the low adoption of such digital services could be the low perceived benefits of the transaction, which goes hand-in-hand with low trust in these providers. Omidyar Network and Dalberg Global Development work shows

that even financially savvy customers prefer using banks only for large transactions. Given that one of the most significant use cases for digital payments is a safe place to store funds while making small transactions easy, changing people's perceptions is integral to proper financial inclusion.

To tackle a few of these issues, we created an intervention that increases confidence in using both digital and financial services. Transactions are demonstrated in a simple manner, and participants are asked to execute them step-by-step. Breaking the task into simple sub-tasks and ample practice could increase their confidence. Further, we increase motivation by providing them with tangible benefits of digital financial services, hoping to change their perception of financial services.

This project aims to test behaviourally informed strategies to increase the uptake of digital financial services in rural Uttar Pradesh. The insights from these research experiments will aid in developing public goods by CSBC (Centre for Social and Behaviour Change) for creating teaching material in different sectors.

Indicators of interest:

- Increase the adoption of digital financial services
- Increasing people's confidence in their ability to do QR code transactions

Based on our pilot, we designed interventions that we hypothesised would increase successful learning of QR code transactions. Our main objectives for the interventions are:

- The process is explained clearly by a relatable person.
- Videos have instructions to pause in the middle and practice the task alongside, breaking the task into manageable steps and allowing for practice.
- Videos provide additional information on handling contingencies and other trust and confidence-building messages.

This document outlines a proposed experiment using the randomised controlled methodology to assess the effectiveness of the proposed interventions in increasing the task performance of QR code transactions using PhonePe and GooglePay apps. It also includes secondary outcomes of confidence and trust.

Methods

Experimental Design Overview

Our design is a randomised control experiment. Primary owners of smartphones who have never used any form of DFS from the districts of Benaras and Chandauli in Uttar Pradesh are eligible. Participants are recruited through primary health workers and asked to come to the village Anganwadis (rural child care Centers). They will be assigned randomly to one of the experimental groups, one control and two treatment arms. The recruitment criteria and the treatment arms are explained in the following sections.

Recruitment will be followed by one in-person baseline survey that includes a questionnaire to measure confidence, digital literacy, financial literacy, and experience accessing financial products. The endline survey will be conducted 2-4 days later and will include the primary outcome measure of completing a QR code transaction without help, general confidence measures, and standard demographics.

Sample Identification

The study will be conducted in the districts of Benaras and Chandauli in Uttar Pradesh. The districts were selected through convenience sampling as our field team there had previously interacted with the healthcare professionals in that area. We leverage these relationships for recruitment.

We informed healthcare workers of the eligibility criteria before the start of data collection. They will mobilise eligible participants to come to the Anganwadis when the baseline is conducted at their centre. Participants will be recruited for the study on a first-come, first-serve basis. Upon reaching the desired target of 20 participants, recruitment will be closed. Participants will be asked screening questions to determine if they have used DFS before, and enumerators will verify there are no DFS apps on their phones at baseline. We will continue data collection by visiting Anganwadis in different villages in these districts until we reach our desired sample of 100 participants per arm.

Eligibility Criteria

- The sample must consist of smartphone owners who are the primary users of the phone, i.e. the phone remains with them for the majority of the time.
- They must not have completed a DFS transaction successfully before this study.

Treatment Components

Short Videos: Participants are shown a short video that explains the process of a QR code transaction on the PhonePe App. Each treatment arm and control have slightly different video content, but the overall video style is the same. We wrote the scripts for all videos in English and had them translated into Hindi by a Copywriter contracted for this purpose. A local content

creator made the videos to ensure they were in the proper Hindi dialect, giving participants a sense of familiarity. Videos were designed to be cognitively simple, with relevant visuals of the app shown. The process is described in simple language, narrated by a relatable person visible on the screen. Table 1 highlights the differences between the three videos.

The treatment arms include an instruction to pause the video and do the task alongside on a separate device. These instructions come five times to demarcate the major steps of this process. We hypothesise that the videos that make the process easy through simple visuals, with familiar language and a relatable person narrating, will lead to greater learning of the task and ensure the adoption of the behaviour. Along with these principles, we test if practising the task while watching the videos step-by-step improves learning even more. By adding an instruction to pause and practice at strategic points, we allow a breakdown of the task (overall goal) into smaller steps (manageable sub-goals) that have previously been known to improve the uptake of behaviour (REFS). We also investigate if giving information on how to manage contingencies, either as additional information or confidence-building messages, increases their confidence in their ability to do the task.

Step 1: Locate the PhonePe app and open it

Pause and practice alongside

Step 2: Find the scan icon on the app and click it.

Pause and practice alongside

Step 3: Scan the QR code

Pause and practice alongside

Step 4: Enter the amount and select the account to pay from and Proceed to Pay

Pause and practice alongside

Step 5: Enter the UPI ID

Pause and practice alongside

Table 1: A brief description of the videos separate for each experimental group

Video	Description of Message	Duration
Control	The video explains the reasons for using UPI transactions and then explains QR code transactions using the PhonePe app, from finding the app to entering the UPI ID and completing the transaction.	3 min 47 sec
T1	The same video as above with an additional instruction to pause and do the step alongside at five different intervals.	4 min 25 sec
T2	The same video as T1 with five pause-and-practice instructions and a few additional pointers to make the task easier and inspire confidence and trust in this DFS process. Additional info: 1. Video reminds to check if internet and location services are on before opening the app 2. Explains what a QR code is and how it's more robust than manually entering an account or phone number 3. Explains that the phone may ask permission to use the camera on the first try and what to press when they see such a window. 4. Mentions that scanning will not happen without the internet 5. Mentions that the internet is needed to	6 min 55 sec

	proceed from the amount page UPI ID page. 6. Same UPI ID is used across apps and there is a limit of 10 transactions a day with a given UPI ID Motivational/Confidence building: 1. Only the amount specified by you can be transferred 2. How to keep the UPI pin safe (not to share/ write it down) 3. Entering the wrong PIN will not lead to any additional problems, just that there won't be any transaction. 4. In case the phone is lost, no one can use your account as they won't have access to the UPI ID. 5. If someone tries to use your account and enters the wrong ID 3 times, the account is locked for 24 hours Grievance Redressal - 1. To mutually agree on the amount sent with the beneficiary and sort out any amount changes. In case of extra money is sent, one can also approach the beneficiary's bank	

Experimental/ Survey Design

The BL and EL surveys will be conducted via an in-person setup, with on-ground enumerators administering the survey on tablets. Intervention, i.e. showing the videos and practising alongside, will happen in person on the day of the baseline. In the case of the treatment arms, the videos are shown twice where. The first time participants are just watching, and the second time

they practise alongside. In the Control arm, they watch the video once without practice. In all arms, they are asked to do the transaction independently at the end of the intervention on the day of baseline (immediate outcome measure). At Endline, they again perform the transaction without seeing the video (outcome measure after a delay) and answer a few questions.

This evaluation will have the following components:

- Baseline: This will be conducted by enumerators in person with tablets.
- Treatment: Videos on performing QR code transactions
    - Treatment A: Watch the video on QR code transactions two times. The second time was watching it with pausing and practising alongside.
    - Treatment B: Watch the video on QR code transactions two times. The second time was watching it with pausing and practising alongside. This video has additional tips, motivational and confidence-inspiring messages, and some content on grievance redressal.
    - Control: Watch the video on QR code transaction two once.
- Immediate Outcomes: Perform the QR code transaction without help immediately after watching the videos
- Endline: This will be conducted in the same format as the baseline.

Randomisation

We randomised at an individual level. After baseline the survey randomly placed them into 1 of 3 groups and the intervention was delivered accordingly.

Data Collection

Freelance enumerators were hired to administer the in-person baseline survey on licensed software, Qualtrics and SurveyCTO on their offline app. Eligible participants were asked to come to Anganwadis by local healthcare workers. They are asked to gather on Anganwadi premises on a specific day. Enumerators conduct the surveys in person and simultaneously type the answers into the app (on their tablets). The interview itself will not be recorded. The duration of the survey is around 60 mins. They will be compensated for their time by paying Rs. 100 for Baseline and Rs. 200 for Endline. Only complete surveys will be used for analysis, and no participants with partial surveys are recontacted to resume the survey. While the enumerators are familiar with the broad outline of the study, they are not made aware of the details of the treatment groups to reduce potential bias. The enumerators introducing the intervention aspects are the same as those administering the baseline survey. The survey and interventions are in Hindi. The endline survey will happen in the same manner.

Experimental Flow

Step 1: Anganwadi workers are contacted to help recruit participants for the study.

Step 2: Local healthcare workers help mobilise people in each village who are primary smartphone owners and haven't used DFS before. They ensure the attendance of participants at baseline and endline surveys by inviting them to the Anganwadi premises on specific days.

Step3: Baseline through in-person surveys: Enumerators conduct surveys and mark answers on SurveyCTO offline app on phones. The same standard consent question is asked to all participants during this process.

Step4: The survey app randomly assigns people into three possible groups: Control, T1 and T2.

Step5: Deployment of treatment - Experiment group-specific video is shown to participants. Those in treatment groups are asked to see their respective videos a second time and practice alongside watching the videos.

Step6: All participants are asked to make a QR transaction on their own after watching the video

Step7: Endline administered through in-person surveys. Enumerators conduct surveys on Qualtrics offline apps on their phones.

Pilot data

The entire questionnaire will be tested in 3 villages with varying differences between baseline and Endline of 1, 2 and 3 days. The same enumerators will collect this pilot data to ensure the data quality and address any concerns faced in the field.

Backcheck

10% of the participants will be chosen for an additional short survey across treatment and control groups and enumerators. A week after the primary data collection, these surveys will be conducted by a separate set of enumerators via a phone call. It will include a few questions about the previous survey length and comfort rating, their intention to use QR codes, how confident they feel about doing this without help, and a few demographic questions.

Sample Size Determination

Based on our pilot data with very similar treatments conducted with a similar study population, the sample size for the current study was determined by performing the following power calculations:

Power	0.80
Alpha	0.05

Pilot	Control had 74% who completed the task alone, and treatment (with pause and practice) 85% completed the task.
Assumption: Effect Size	N = 100 Outcome: Proportion of people that completed the task independently Effect size = 0.11 (absolute difference), 14.86% (relative difference)
Estimated required sample size	208 PW per treatment arm Total: ~600

Based on observations from the pilot, we improved the interventions, including showing the treatment videos twice and mandatory compliance with pause and practice instructions. Thus instead of 200, we plan to start with a smaller sample size of 100 per group. If the effect is ambiguous with this sample, we plan to conduct a replication experiment with a larger sample size. With 100 per group and a 74% completion rate in the control group, we can detect a relative improvement of 20%. As sampling is convenience based, we continue data collection till we complete at least 100 in each group.

Outcome Variables

We primarily want to test if making participants practise alongside watching videos helps improve their learning of the task and if a larger proportion of these groups can complete the task independently at Endline (48 - 100 hours after the practice session). We include immediate outcomes after the intervention to test for a correlation between performance immediately after watching the videos and at Endline. Additionally, participants' confidence before the start of the task and at the last step of the task (before the outcome is known) is also measured to check if participants' confidence in their ability to do the task correctly is different between treatment groups and control. Specifically, do the participants in T2, which includes additional information to handle contingencies, and confidence-building messages, report increased confidence compared to T1? Further, we measure digital and financial literacy, exploring which is a higher predictor of successful learning and if people's general confidence predicts their performance. See Table 2 for a description of all constructs measured in the study and how these measures are created.

Table 2: Description of all outcomes in the study

Measured Variable	Description[1]	Outcome Measure
QR code transaction performance at Endline **(Primary Outcome)**	The performance will be measured by successful transactions as well as the number of steps completed correctly (observed by the enumerator) Participants perform two tasks - one on PhonePe, which they trained on, and the other on QR code transactions on GooglePay, a new platform.	Task completed is a binary variable, and the number of steps completed is an ordered categorical variable (0-5).
QR code transaction performance immediately after treatment **(Immediate Outcome)**	The performance will be measured by successful transactions as well as the number of steps completed correctly (observed by the enumerator) Participants perform two tasks - one on PhonePe, which they trained on, and the other on QR code transactions on GooglePay, a new platform.	Task completed is a binary variable, and the number of steps completed is an ordered categorical variable (0-5).
Specific Confidence **(Secondary Outcome)**	Participants are asked to rate how confident they can complete the task correctly at the beginning and end (before the task outcome is known). In each case, participants answer and state how confident they are of that answer using the Likert scale rating of likelihood (1-5).	- Ordered categorical variable (1-5)

[1] Please refer to the survey instrument for further details on all outcome measures across tables.

	This is done for both tasks and at both time points of the endline and immediately after treatment.	
Trust **(Secondary Outcome)**	Trust in financial institutions, non-people related services like ATMs, and digital transactions are asked to be rated on a scale of 1-5 This is measured at both endline and baseline	Median trust score of the three questions. -Ordered categorical variable (1-5)
General Confidence **(Control)**	General Confidence measures are three general tasks (presented in the same order as below for all participants) administered on a tablet to measure general confidence. Both accuracies of the task and confidence (Likert scale rating from 1-5) in each answer are measured. ● Esoteric Analogies Test - The test contains 20 items of the following type: CHICK is to HEN as CALF is to: BULL, COW, COAT, ELEPHANT (answer = COW). The enumerator reads out the words and enters the solution and confidence rating. The trials are predefined, and the same set of trials is presented to each participant in the same order.	The number of correct responses across questions in each task. Variable type: Numerical (0-20) or (0-32) - Mode of confidence rating. Variable type: Numerical (0-20) or (0-32) - Bias: Difference between average subjective confidence estimates and factual accuracy Bias = Σ(ci – ai)/10 [direction and magnitude]. From +1 to -1. High (> zero) and low (< zero) scores, indicative of poor confidence calibration, are described as over and under-confidence, respectively. - Discrimination: the difference between average confidence assigned to correct and incorrect items $D = \frac{\frac{\Sigma c_{correct}}{p} - \frac{\Sigma c_{incorrect}}{q}}{}$ [*metacognitive ability*]

	● Panamath test - Participants, must judge whether there are more green or pink dots in a given image. The difference between dots ranges from 3-10. The probability of the difference being 3 is 49%, 4 is 24%, 5 is 12%, 6 is 6%, and 7-10 is 2% each. The number of dots of each colour range from 5-20. The size of the dots remains constant in all trials, but their position is jittered across a 6X8 grid. There are 20 questions, and the respondent answers and is given confidence ratings for each. The trials are predefined, and the same set of trials is presented to each participant in the same order. ● Vocabulary test - A word and four options are shown below. The enumerator reads out the word and the options and asks which are closest in meaning to the target word. The enumerator enters the answer and the confidence rating for 20 items. The trials are predefined, and the same set of trials is presented to each participant in the same order.	
Digital literacy **(Control)**	Participants are asked questions about smartphone use through pictures. They have to point to the location they would touch for specific functions. There are five such questions.	The number of correctly answered questions. Variable type: Numerical (0-5)

	Other details on smartphone comfort and use will be reported as descriptive results and not used further in the analysis.	
Financial literacy **(Control)**	Participants are asked questions about financial services, testing their knowledge of loans, insurance etc. There are three such questions.	The number of correctly answered questions. Variable type: Numerical (0-3)
Financial Services Access **(Control)**	Participants are asked how they access financial services, like going to the bank, depositing a cheque etc. They point to specific points on a relevant image to answer how they perform these tasks. There are three such questions. There are other details on how often they visit the bank, which makes financial decisions in the family, and financial services used by other family members. These will be reported as descriptive results and not used further in the analysis.	The number of correctly answered questions. Variable type: Numerical (0-3)
Demographics: **(Control)**	Age, gender, highest education level and employment of participants. Household Income, number of people in the house, Religion and Caste. The number of people in the house between 12-22 years.	Age – Continuous numeric variable. Gender – Binary Variable. Education – Ordinal variable (1-9) Employment – Binary variable The logarithm of household income per person – Variable Type: Continuous

		Religion and Caste combined – Variable Type: Categorical variable (1-9) Number of people in the house between 12-22– Continuous variable

Model Specifications

Ordered Logistic Regression will be used for ordinal outcomes (Steps completed, specific confidence, trust) and logit regression for the categorical variables (Task completed).

We will have a hierarchy of models where each model adds one further factor.

For the primary outcomes of task completed and the number of steps completed, and the secondary outcome of specific confidence at the beginning and end of the task for each of the tasks one and two at Endline (8 measures, separately for the two treatment groups):

M1 uses only treatment assignment as a factor.

M1* uses treatment assignment and the respective immediate outcome as factors.

M2 uses treatment assignment, digital literacy, financial literacy and financial services access as factors.

M3 uses treatment assignment, digital literacy, financial literacy, financial services access and demographics as factors.

M4 uses treatment assignment, digital literacy, financial literacy, financial services access, demographics, and specific confidence as factors.

M5 uses treatment assignment, digital literacy, financial literacy, financial services access, demographics, and general confidence as factors.

The same five models are used for the secondary outcome - trust (M1* is excluded).

We repeat the same models for the immediate outcomes of both performance and confidence, except there is no M1* (which is not part of the reported analysis and will only be added as a supplement for completeness).

M1: Y ~ treatment_assignment + error

M1*: Y ~ treatment_assignment + immediate_outcome + error

M2: Y ~ treatment_assignment + digital_literacy + financial_literacy + financial_service_access + error

M3: Y ~ treatment_assignment + digital_literacy + financial_literacy + financial_service_access + demographic_covariates + error

M4: Y ~ treatment_assignment + digital_literacy + financial_literacy + financial_service_access + demographic_covariates + specific_confidence + error

M5: Y ~ treatment_assignment + digital_literacy + financial_literacy + financial_service_access + demographic_covariates + general_confidence + error

Y = outcome measures in Table 2

treatment_assignment = dummy variable, 1 for treatment and 0 for control.

All analysis, including randomisation and data checks, will be conducted using custom-made MATLAB (The MathWorks, Inc) scripts in R (R Core Team, 2014).

Randomisation Check

In a randomised control study, treatment status is the only difference between the treatment and control groups. On average, all other characteristics of treatment and control group members, including demographics, should be balanced. Treatment effect estimates could be biased if there is an imbalance across the groups despite the randomisation process. We will check for a balance between treatment and control groups for baseline measures.

M6: X ~ treatment_assignment + error

X is the different Outcome measures of interest at baseline.

Attrition Check

The biggest concern with attrition is the possibility of bias. If the types of treatment group participants who attritted are systematically different from the control participants in a manner

related to our outcomes, results are likely biassed. For example, if poorer participants leave one treatment group more than the control group, and income correlates with study outcomes, results are likely skewed upward. We would analyse by regressing a binary variable that equals one if a participant attritted on treatment status,

M7: A ~ treatment_assignment + Xi + treatment_assignment* Xi + error

A is a binary variable of attrited or not.

Xi is the different Outcome measures of interest at baseline.