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## The Bold and the Bankable: How the Nuestro Barrio Telenovela Reaches Latino Immigrants with Financial Education

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**This article presents and evaluates *Nuestro Barrio*, a Spanish-language telenovela designed to reach Latino immigrants with financial education. *Nuestro Barrio*'s educational model is discussed in the context of the Transtheoretical Model of Behavior Change, which defines the stages individuals move through as they make incremental progress toward sustained behavior change. The Transtheoretical Model of Behavior Change is also used to inform a limited evaluation of the impact of *Nuestro Barrio* on viewer behavior. The empirical evidence is consistent with *Nuestro Barrio*'s intended educational effects, suggesting that *Nuestro Barrio* is particularly useful as a tool for raising viewer awareness.**

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Raul Yzaguirre, President of the National Council of La Raza, testified to Congress in 2002 that targeted approaches to reaching Latino immigrants should be a priority for financial education efforts.<sup>1</sup> This contention was echoed by participants of a forum sponsored by the GAO (2004), who argued that the specific needs of new immigrants require tailored outreach strategies. These statements suggest that the translation of existing financial education programs is insufficient to meet the needs of new Latino immigrants. Instead, reaching Latino immigrants with financial education

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The authors thank the Ford Foundation for their generous support of this research. An earlier version of this article was presented at the 2008 American Council on Consumer Interests annual conference in Orlando, FL, July 27–29, 2008.

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1. From the prepared statement of Raul Yzaguirre to the Senate Committee on Banking, Housing, and Urban Affairs. "Hearing on the State of Financial Literacy and Education in America." February 6, 2002 (banking.senate.gov/02\_02hr/020602/yzaguir.htm).

requires targeted delivery strategies that focus on topics of distinct interest to Latino immigrants while recognizing diversity within the Latino population. Unfortunately, this model of tailored financial education provision contrasts with the majority of existing financial education initiatives, which seek to widely distribute a standard curriculum.

This article presents and evaluates the alternative financial education model underlying *Nuestro Barrio*, a Spanish-language telenovela designed to reach Latino immigrants with financial education. Initially run on network television in North Carolina, *Nuestro Barrio* attempts to attract viewers with its entertainment value as a telenovela while simultaneously providing financial education content. Episodes air in Spanish and address topics of specific interest to Latino immigrants. These characteristics suggest that *Nuestro Barrio* may overcome several of the barriers that face traditional financial education programs. In particular, *Nuestro Barrio*'s use of the telenovela format to deliver financial education content may allow it to reach households that might not otherwise seek out financial education.

In presenting and discussing *Nuestro Barrio*'s capacity as an educational tool, we rely on the Transtheoretical Model of Behavior Change (TTM). First developed by researchers studying health behaviors, TTM defines the stages individuals progress through as they move toward sustained behavior change (Prochaska and Norcross 2001). This model is suited to framing the potential benefits of *Nuestro Barrio*, as the TTM stages explicitly recognize that individuals begin in precontemplation—a stage at which individuals lack awareness of the potential benefits of behavior change. Where *Nuestro Barrio* may carry the potential to reach these households, traditional financial education programs serve individuals who have sought out instruction and therefore are likely to have progressed beyond precontemplation.

The TTM framework is also used to inform the empirical evaluation of *Nuestro Barrio*'s impacts with respect to two behaviors: bank account ownership and preparation for homeownership. In defining the stages of behavioral change, TTM offers a structure for measuring incremental progress toward behavior change. A first goal of this article is to present *Nuestro Barrio*'s educational model using the TTM framework to discuss *Nuestro Barrio*'s potential as an educational tool. The second objective of this article is to evaluate the impact of *Nuestro Barrio* on viewer behavior for a small sample of viewers in North Carolina. Interpretation of the evaluation results is limited by the nature of this sample. Nevertheless, the results of the empirical analysis are consistent with the effects of *Nuestro Barrio* implied by the TTM framework. Specifically, *Nuestro Barrio* appears to be particularly useful as a tool for raising viewer awareness.

## LITERATURE REVIEW

While the discussion in this article is specific to *Nuestro Barrio*, consideration of *Nuestro Barrio*'s educational model directly addresses a critical gap in the research literature regarding financial education. A first strand of this literature examines the extent of financial illiteracy among American households. For instance, Lusardi (2008) documents demographic gaps in financial literacy by education level, gender, and race. Second, a large number of studies evaluate the effectiveness of traditional financial education programs in educating participants. This literature is simply too large to review exhaustively here, including individual literatures devoted to the effectiveness of homeownership counseling, workplace/retirement education, general financial literacy, and high school financial education programs.

Unfortunately, far less research has examined the potential disconnect between the populations most in need of targeted interventions and the populations served by existing financial education programs. In part, this gap in the literature is due to the diversity of obstacles to financial education across different populations. For instance, financial education programs targeted at Latino immigrants must overcome barriers related to language, curriculum, and trust. In contrast, efforts to increase financial literacy among elderly widows face a much different set of barriers. As a result, delivery of financial education to specific groups often requires tailored approaches that overcome group-specific obstacles (Toussaint-Comeau and Rhine 2000).

The examination of *Nuestro Barrio* in this article approaches the potential disconnect between financial literacy needs and provision from a different angle. While *Nuestro Barrio* offers a case study of an initiative tailored to the population of Latino immigrants, *Nuestro Barrio*'s emphasis on entertainment value also recognizes the importance of awareness as a primary obstacle to financial education. TTM theory reinforces this insight, clarifying that individuals begin in precontemplation and may not perceive benefits from financial education.<sup>2</sup> In making this distinction, TTM theory provides a conceptual structure that both elucidates the limitations of existing financial education programs and guides the development of targeted interventions.

Beyond its relevance to the literature on financial education, examination of *Nuestro Barrio*'s educational model reflects the emerging use of social marketing. Recognizing the limitations of existing programs, policy makers

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2. This contribution of TTM theory is not discussed by Lyons and Neelakantan (2008), whose consideration of TTM theory focuses on its implications for financial education writ large.

and financial educators have begun to experiment with high-scale communications. Since *Nuestro Barrio* first aired, several financial education providers have begun to devote resources to public service announcements and advertising campaigns that seek to broadly distribute financial education messages. Similarly, advocates have called for a major national media campaign to be a priority for financial education efforts (GAO 2004). *Nuestro Barrio*'s use of the telenovela delivery format speaks directly to these efforts to supplement traditional financial education programs with social marketing initiatives.

### NUESTRO BARRIO: TELENOVELA WITH A MESSAGE

The *Nuestro Barrio* telenovela (soap opera), a Spanish-language miniseries, seeks to provide both entertainment and financial education. *Nuestro Barrio*'s education and outreach model seeks to attract viewers with its entertainment value, simultaneously providing educational value on financial literacy topics. The miniseries of thirteen episodes is the nation's first Spanish-language show distributed on English-speaking networks. Originally broadcast on the WB in North Carolina markets, *Nuestro Barrio* has since appeared on both for-profit and subsidized television channels throughout the United States, including markets in Chicago, Miami, and New York. As of August 2007, *Nuestro Barrio*'s reach included twenty-five million potential viewers.<sup>3</sup>

In the context of existing financial education programs, *Nuestro Barrio*'s educational model contains several unique features. First and foremost, *Nuestro Barrio* delivers financial education to viewers in their homes. Concerns about documentation and skepticism of banks may prevent many Latino immigrants from seeking out financial education, particularly from bank- and government-sponsored programs. These factors create barriers to financial education delivery, requiring outreach efforts that alter immigrants' perceptions of financial institutions and that inform potential participants regarding banks' documentation requirements. *Nuestro Barrio*'s educational model directly addresses these obstacles through its use of mainstream media.

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3. A DVD of the first season is also distributed by partner banks. Freddie Mac funded production of the first season, and BB&T—a southeast regional bank and the ninth largest bank in the United States—became the first bank partner to distribute *Nuestro Barrio* in its branches. Viewership is also supported by cross-marketing in English and Spanish and by grassroots outreach through nonprofit community organizations. In early airings in the Raleigh/Durham/Fayetteville market, *Nuestro Barrio* attracted more than six thousand households per episode.

A second and related feature of *Nuestro Barrio* is its use of the telenovela delivery format. Run on network television, *Nuestro Barrio* is intended to compete for and attract viewers based on its entertainment value, incorporating educational content into the plot and story line of its characters. This equal emphasis on entertainment value is a central component of *Nuestro Barrio*'s model of financial education delivery. By attracting viewers to its story line, *Nuestro Barrio* carries the potential to reach households that otherwise might not seek out financial education.

Third, *Nuestro Barrio*'s educational curriculum is tailored to the needs of Latino immigrants, covering both core financial education content and topics of specific interest to Latino immigrants. Over the course of the first season, viewers are exposed to the core elements of the homeownership curriculum. Additionally, viewers are introduced to the landscape of financial services in the United States, including the types of financial services products and providers and the documentation requirements necessary for each. A final unique feature of *Nuestro Barrio*'s educational model is its use of community relationships to convey financial information. *Nuestro Barrio*'s educational content is communicated either through the experiences of the show's characters or through dialogue in which characters relay information to their family and friends. Several of the show's characters work in banks, insurance offices, and other financial institutions and offer professional advice to friends and family members. In this way, the educational information is embedded in the social relationships of the show's characters.

These characteristics of *Nuestro Barrio* are perhaps best illustrated through a brief exposition of several plotlines. As examples, Fedi, a young adult, provides a cautionary tale about the dangers of credit card overspending. The mechanic, Javier, loses his cash savings in a robbery and is finally convinced to open a bank account. The Sanchez family of six lives in a crowded apartment with noisy neighbors and dreams of owning a home. Several episodes follow the Sanchez family as they shop for and purchase a home, including one episode in which they file a formal complaint against a discriminatory real estate agent. Last, Ricardo, a banker, interacts with Fedi, Javier, and the Sanchez family both at the bank and informally at social events, talking with them about their situations and about his work at the bank.

## NUESTRO BARRIO AND THE TRANSTHEORETICAL MODEL OF BEHAVIOR CHANGE

Our evaluation of *Nuestro Barrio*'s capacity as an educational tool is informed by the TTM. First developed by researchers interested in

addiction and recovery, TTM defines the stages individuals progress through as they move toward sustained behavioral change. This framework structures actions as a set of repeated decisions between a “healthy” and an “unhealthy” outcome. In its original applications to smoking and other addictions, this definition explicitly recognized the potential for individuals’ actions to deviate from their intentions and/or desires. Financial educators have since applied the TTM framework to financial behaviors including saving and debt reduction. The administrators of the Money 2000 program used TTM theory to develop interventions targeted to the individual’s specific needs (Xiao et al. 2001, 2004). Shockey and Seiling (2004) also used measures of the TTM stages of change to evaluate the impact of financial education on participant saving in an individual development accounts program.

The discussion in this article focuses on the potential for *Nuestro Barrio* to impact viewer behavior with respect to two actions: (1) bank account ownership—defined as regular depositing of checks into a bank account—and (2) preparation for homeownership—defined as regularly saving for a down payment or building credit in preparation for the purchase of a home.<sup>4</sup> TTM categorizes individuals into five stages with respect to any given action—precontemplation, contemplation, preparation, action, and maintenance (see Prochaska, DiClemente, and Norcross 1992):

1. **Precontemplation:** Individuals in the precontemplation stage have no intention to change, and though some in the stage may wish to change, many are unaware of a need to change. Instead, it is usually a friend or spouse who brings the desired action to the individual’s attention. The lack of any serious intention to change in the foreseeable future (usually defined as within six months) identifies individuals in precontemplation.
2. **Contemplation:** Individuals in the contemplation stage are seriously considering the benefits and costs of changing. These individuals are fully aware of the benefits of changing behavior but are not quite ready to take action. Most analysts define contemplation as the intent to change behavior sometime in the next six months. This type of weak intention lends itself to procrastination and to continued weighing of the benefits and costs of action. One study of smokers in the contemplation stage found that the modal stage of these smokers two

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4. In choosing these actions, we performed three focus groups to explore Latino immigrants’ interactions with financial services. For full documentation of the focus group methodology and findings, see Appendix E of the *Nuestro Barrio* report at [www.ccc.unc.edu/?id=publications&t=Publications](http://www.ccc.unc.edu/?id=publications&t=Publications).

years later was again contemplation (DiClemente and Prochaska 1985).

3. Preparation: Preparation is a hybrid between contemplation and action. Individuals in the preparation stage exhibit a serious intention to change the problem behavior within the *next* month and may have unsuccessfully attempted to change the behavior in the past. In fact, preparation may include small steps toward behavior change, such as leaving credit cards at home when going to the mall. However, the basic problematic behavior persists.
4. Action: As the name suggests, action is the stage in which individuals actively modify their behavior patterns to address the problem. These individuals have successfully altered their behavior but are at some risk of relapse. Prochaska, DiClemente, and Norcross (1992) define action as having successfully achieved behavior change for less than six months. This definition overtly recognizes the conscious effort sometimes required to maintain the pattern of healthy action.
5. Maintenance: The maintenance stage involves continued positive behavior and prevention of relapse. Individuals in maintenance may still need to exert effort to sustain continued behavior change but have generally established a pattern of healthy action. Entrance into maintenance is generally defined to occur after six months of sustained action without relapse.

The stage descriptions suggest that traditional financial education programs may serve primarily individuals who have already reached or surpassed the contemplation stage. For instance, homeownership education programs are designed to meet the needs of individuals who are actively considering and/or pursuing homeownership. Similarly, general financial literacy programs often reach only those individuals who seek out instruction. In this way, existing financial education initiatives may overlook individuals in the precontemplation stage. For these individuals, financial education provision may be of little value until the individual becomes convinced that bank account use and/or homeownership are potentially beneficial.

Nuestro Barrio's educational model seeks to couple the provision of financial education with this outreach role. While some viewers are likely to be in the later stages of change, many may be relatively unaware of the potential benefits of bank account use and/or homeownership. The ability to reach these individuals in precontemplation is hypothesized to be a primary strength of Nuestro Barrio's educational model.

Nuestro Barrio also addresses core topics of the financial literacy and homeownership education curriculums, which may also be useful to

individuals in later stages. Individuals in contemplation may use the experiences of the show's characters to evaluate different behaviors. Additionally, *Nuestro Barrio* may reinforce the behavior of individuals in the maintenance stage. Where traditional financial literacy programs last for fixed periods, viewing *Nuestro Barrio* consistently may reinforce positive behavior among individuals switching from check cashers to bank account use or among individuals attempting to save toward a down payment.

Consideration of *Nuestro Barrio* with respect to TTM's processes of change helps to clarify the pathways through which *Nuestro Barrio* may affect borrower behavior. TTM theory identifies multiple processes of change by which individuals progress into later stages. We identify seven processes of change relevant to financial behaviors—consciousness raising, dramatic relief, environmental reevaluation, social liberation, self-reevaluation, self-liberation, and reinforcement management.<sup>5</sup> Each process is associated with individuals in specific stages and is theorized to reflect an internal mechanism used by individuals to progress into a later stage.

Viewers in the precontemplation stage must become aware of the potential benefits of bank accounts and homeownership. Similarly, individuals in the contemplation stage struggle with doubts about the potential benefits of behavior change and continue to weigh the benefits and costs of behavior change. These individuals rely on consciousness raising, dramatic relief, and environmental reevaluation, processes that reflect the collection and evaluation of information about the potential benefits of behavior change. Progress to preparation is associated with the self-reevaluation process of change, whereby individuals make connections between the behavior of interest and their own perceptions of themselves and the surrounding society.

The progression from preparation toward action and eventually maintenance requires that individuals translate their internal evaluations of potential behavior change into observable steps toward sustained action. The self-liberation process occurs as individuals commit to act and/or begin to believe

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5. Prochaska et al. (1988) define ten processes of change. We exclude three processes of change both because of concerns about their relevance with respect to financial behavior and because of time constraints with the survey instrument. The definitions of the relevant processes are as follows: *consciousness raising*—"increasing information about one's self and the problem behavior"; *dramatic relief*—"experiencing and expressing feelings about one's problems and solutions"; *environmental reevaluation*—"assessing how one's problem affects physical environment"; *social liberation*—"increasing alternatives for nonproblem behaviors available in society"; *self-reevaluation*—"assessing how one feels and thinks about oneself with respect to a problem"; *self-liberation*—"choice and commitment to act or belief in ability to change"; and *reinforcement management*—"rewarding one's self or being rewarded by others for making changes" (Prochaska, DiClemente, and Norcross 1992).

in their ability to change, characteristics common among individuals moving from preparation to action. Last, individuals who succeed in sustaining their behavior change often report reinforcement management, in which the individual uses internal or external incentives to prevent relapse.

Nuestro Barrio may stimulate these processes among individuals to the extent that viewers internalize the characters' experiences. For example, viewers without bank accounts may emotionally react to the episode in which Javier loses his savings in a robbery, a reaction consistent with the dramatic relief process of change. In contrast to the factual provision of financial education, *Nuestro Barrio* frames financial problems and behaviors with respect to the characters and social community. In this way, viewers may be more likely to connect the financial topics to their own behaviors.

## SURVEY INSTRUMENT AND MEASURES

In structuring the process of behavior change, the TTM directly informs the definition of a set of outcome measures that capture incremental behavior change. This section presents and discusses our measures of the stages and processes of change, as well as direct measures of financial knowledge and attitudes. The appeal of the TTM is that it provides a theoretical framework for measuring the process through which individuals move toward action.

The evidence from evaluations of general financial literacy programs is largely regarded as mixed. While multiple researchers show positive impacts for individual financial education programs, these evaluations vary widely in the types of evaluation methods and measures used. Several evaluations of employer-based financial education programs show robust effects on employee savings rates and other action-based outcome measures (Bernheim and Garrett 2003; Thaler and Benartzi 2004). However, studies of other types of financial education have generated less conclusive results. This diversity of findings has generated calls for stronger theoretical linkages between financial education and behaviors, specifically for the development of a framework that can inform the choice of outcome measures (Fox, Bartholomae, and Lee 2005; GAO 2004; Lyons et al. 2006).

The choice of the TTM framework for this analysis is limited by the newness of the TTM in financial education research. Researchers developing the Money 2000 program first applied the TTM framework to financial issues using TTM theory to develop targeted interventions (Xiao et al. 2001, 2004). Shockey and Seiling (2004) later used the TTM stages in evaluation of a financial education program, classifying individuals into

stages and examining progress across time. While these studies conceptually inform our application of TTM to *Nuestro Barrio*, this study is the first to use empirical measures of TTM stages and processes of change with respect to bank account ownership and preparation for homeownership. Development of these measures therefore relies on previous application of the TTM framework to health behaviors (see Cardinal 1997; Lechner et al. 1998; Marttila and Nupponen 2003; Povey et al. 1999; Reed et al. 1997; Sutton 2000).

For each behavior—bank account ownership and preparation for homeownership—we sort respondents into the five stages of change using a common staging algorithm (see Appendix 1). While some variation of this staging formula is used by almost all TTM studies, researchers have raised concerns about the arbitrary nature of the time lengths used to classify stage boundaries (Brug et al. 2005; West 2005). As a result, the discrete categorization of stages should be interpreted as an approximation of respondents' progress along the continuous spectrum toward sustained behavior change. This criticism carries important ramifications for stage-based intervention programs (Adams and White 2004). However, it is less concerning with respect to the use of TTM for evaluation. Provided that all respondents are classified similarly, comparison of respondents' progress through the stages of change reflects movement toward sustained action.

The process of change measures are presented in Table 1. For each measure, respondents were asked to indicate how often they experienced the associated process—never, occasionally, sometimes, a lot, or all the time. Each measure is coded from one to five with higher values indicating more intense experience of the change process. To identify whether certain processes of change are active, respondents were asked each of the questions in Table 1. Because this is the first application of TTM to bank account use and homeownership, the measures shown in Table 1 are original. Development of these measures was informed by the measures presented by Prochaska et al. (1988) with respect to smoking. Nevertheless, the reader should examine the content and validity of each measure and interpret all results accordingly.

The measures created using the TTM framework are also supplemented with several direct measures of financial literacy and financial attitudes. First, *Nuestro Barrio* directly informs viewers about multiple financial literacy topics. To test whether viewers absorb the factual information presented, the survey instrument also included three yes/no questions on topics covered in *Nuestro Barrio* episodes (see Lit1–Lit3 in Table 2). We also create an additive index score by summing the individual measures. It should be emphasized that this additive measure is not intended to reflect the respondent's general level of financial literacy but rather whether the

TABLE 1  
*Processes of Change Measures*

Variable	Measure (1–5 with 1 = Never and 5 = All the Time)	Process
<i>Account ownership</i>		
	How often do you . . .	
Prac1	Pay attention to friends and family when they talk about using bank accounts?	Consciousness raising
Prac2	Collect information about banks or credit unions?	Consciousness raising
Prac3	Fear getting robbed when you carry lots of cash?	Dramatic relief
Prac4	Think about the fact that there would be fewer robberies against Latinos if more of us kept our money in the bank?	Environmental reevaluation
Prac5	Think about how having an account can help make your life better?	Self-reevaluation
<i>Homeownership</i>		
	How often do you . . .	
Prho1	Pay attention when people talk about owning a home?	Consciousness raising
Prho2	Seek out information about getting a mortgage?	Consciousness raising
Prho3	Dream about owning a home or your own one day?	Dramatic relief
Prho5	Notice that more and more Latinos are buying homes?	Social liberation
Prho7	Tell yourself you can own a home if you work at it?	Self-liberation
Prho9	Look at houses that are for sale to encourage yourself?	Reinforcement management

Note: Lit4 is not directly addressed in any *Nuestro Barrio* episode and is therefore not included in the index measure (Littot). Instead, it is used as a test of the research design.

viewer absorbed specific financial content addressed in *Nuestro Barrio*. Table 2 also includes a fourth financial literacy measure (Lit4) on a subject not covered in *Nuestro Barrio*; this question is included as a test of the research design and the resulting samples and is discussed in greater depth in later sections.

TABLE 2  
*Financial Literacy Measures*

Variable	Question (Yes/No Answer)
<i>Literacy</i>	
Lit1	You must make a 20 percent down payment to purchase a home (false = 1).
Lit2	Money in the bank is safe (true = 1).
Lit3	You must have a social security number to open a bank account in the U.S. (false = 1).
Lit4	If a person buys a home and is deported, they lose ownership of the home (false = 1).
Littot	Lit1 + Lit2 + Lit3.

Second, *Nuestro Barrio* attempts to impact viewer attitudes about banks and financial services providers. Because many Latino immigrants come from countries with less stable financial institutions, a central component of *Nuestro Barrio*'s educational mission is to overcome distrust of banks and bank employees. Table 3 displays the questions used to measure financial attitudes. For the attitudinal questions, respondents were asked whether they strongly disagree, disagree, neither agree nor disagree, agree, or strongly agree, coded with values from one to five with higher values indicating greater trust. We again create an additive index score by summing the individual attitudinal measures.

## DATA COLLECTION AND METHODOLOGY

The survey measures presented in the previous section form the substantive core of the survey instrument. In administering the survey, Latino immigrants were recruited through two separate channels, as recruiting a sufficient number of Latino immigrant respondents required multiple recruitment efforts.<sup>6</sup> First, the treatment group was recruited through Latino festivals, supermarkets, health fairs, flea markets, and churches. In each case, the respondent agreed to participate, provided contact information, and was given or sent a DVD of *Nuestro Barrio*'s first season.<sup>7</sup> Each treatment group respondent was then interviewed by telephone. Of the 213 resolved phone numbers, 101 interviews were completed producing eighty-three usable observations.

A comparison group of respondents not receiving a *Nuestro Barrio* DVD was recruited and surveyed by telephone. Respondents were sampled by random digit dialing of households in the Raleigh/Durham metropolitan area. Consistent with the requirements applied to the treatment group, respondents were also screened for Spanish-language dominance and required to be eighteen years of age or older, not currently a homeowner, and originally from a Latin or South American country. For the control group, calls to 2,032 resolved phone numbers carried an acceptance rate of 49.4 percent. Of these respondents, 115 respondents met the screening

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6. The treatment group was therefore recruited through multiple recruitment events over the course of several months. Recruitment of the control sample was phased to match the timing of treatment sample interviews.

7. Only thirty DVDs were distributed at recruitment sites, of which only one produced a complete survey response. Excepting this respondent, the treatment sample received a mailed DVD after agreeing to watch episodes and providing contact information at the recruitment site.

TABLE 3  
*Attitudinal Measures*

Variable	Question (1–5 with 1 = Strongly Disagree and 5 = Strongly Agree)
<i>Attitudes</i>	
Att1	I feel welcome in a bank.
Att2	I would feel comfortable asking a bank employee for financial advice.
Att3	Banks don't want to do business with people like me (reverse coded).
Att4	I can become a homeowner in the U.S.
Atttot	Att1 + Att2 + Att3 (reverse coded) + Att4.

requirements and completed interviews, producing eighty-eight usable observations.

Recruitment of the treatment and control group samples in this way does not reflect random assignment and therefore must be approached as a quasi-experimental design. In particular, we are concerned about the potential for unobserved differences between individuals recruited through each channel. We approach this issue first by using the propensity score matching (PSM) methodology to construct a counterfactual control group.<sup>8</sup>

The PSM estimator approaches the construction of a control group by using observed characteristics to match each treatment group observation to the most similar observation in the control group. The initial sample contains 171 respondents who met the screening requirements for survey participation.<sup>9</sup> Of this group, eighty-three respondents were originally recruited to the treatment sample, of whom sixty-eight reported having watched *Nuestro Barrio*. Of the eighty-eight respondents recruited to the control sample, four reported having watched *Nuestro Barrio* and are removed from the control sample.

The PSM estimator requires the analyst to explicitly examine the distribution of the covariates through the common support and balancing requirements (Foster 2003). In specifying the PSM model, we require common support with respect to the propensity score, eliminating twelve observations whose propensity scores fell outside the common support region. We also implement balancing tests to examine the distribution of covariates in different regions of the propensity score continuum (Smith and Todd

8. Evaluations of the PSM method have shown that empirical implementation of matching methods requires that (1) the same survey questions are used for both treatment and control group respondents and (2) respondents in each group are drawn from the same geographic area (Heckman et al. 1997, 1998; Smith and Todd 2001, 2005). Both requirements are met by the *Nuestro Barrio* survey design.

9. Respondents recruited into both the treatment and the control groups were screened for Spanish-language dominance and required to be eighteen years of age or older, not currently a homeowner, and originally from a Latin or South American country.

2005). The matches used in estimation pass tests comparing the covariate means at all levels of the propensity score continuum. The resulting analysis file consists of 155 observations, of whom 66 respondents viewed at least one episode of *Nuestro Barrio*. For the remainder of this article, we define the treatment group to consist of these sixty-six respondents, with the remaining eighty-nine respondents in the control group (twelve recruited through the first channel and seventy-seven recruited through the second channel).<sup>10</sup>

Table 4 describes *Nuestro Barrio* viewers (treatment) and nonviewers (control) prior to matching on the basis of the variables used to calculate the propensity scores. Table 4 also reports whether *t*-tests indicate that the difference between the means of the viewers and nonviewers are significant at the .05 level. For the majority of covariates, the treatment and control groups are remarkably similar with respect to both economic and demographic characteristics. Respondents earn between \$20,000 and \$25,000, on average, and have been in the United States for an average of seven to eight years.<sup>11</sup> Nearly 80 percent of both groups report Mexico as their country of origin, and the groups report very similar household characteristics. The exceptions to this comparability are for the education and English ability variables. Members of the treatment group are, on average, more likely to have completed high school and more likely to speak some English.

The higher levels of education and English proficiency of the treatment group may raise concerns for estimation to the extent that they reflect a greater ability to navigate the financial services system. We directly adjust for this possibility by requiring an exact match with respect to the education and English ability variables. As a result, the matched sample contains precisely equal levels of education and English ability. While this adjustment does not alter the large sample properties of the PSM estimator, it may improve the empirical implementation with respect to the evaluation of *Nuestro Barrio*. Consequently, the differences in education and English ability in the unmatched sample raise concerns for estimation only if these variables are reflective of different unobserved characteristics among viewers and nonviewers.

Rosenbaum and Rubin (1983) show that matching based on a propensity score provides unbiased estimation of treatment effects. Because of the

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10. As we detail later in the report, as a robustness test, we also estimate each model using the original assignment to the treatment and control samples to define the treatment variable. Our results are generally robust to this definitional choice.

11. The difference in mean incomes between samples closes substantially in the matched sample.

TABLE 4  
*Mean Values of Covariate Variables*

Covariate	Treatment	Control
Household income	\$24,555	\$22,602
Speaks some English	0.79*	0.61
High school degree	0.61	0.47
Age	31.3	32.8
Female	0.61	0.62
Married/partnered	0.59	0.71
Divorced/separated/widowed	0.11	0.09
Children in the household	0.74	0.76
Number of household members	3.7	3.8
Number of years in the United States	7.2	7.3
Country of origin Mexico	0.73	0.81
<i>N</i>	66	89

\* $p < .05$  for *t*-tests of differences in means.

relatively small sample size, we match with replacement and match each treatment group observation to one “nearest neighbor” control group observation.<sup>12</sup> The simple matching estimator for the average treatment effect can be represented as:

$$\beta = \frac{1}{N} \sum_{i=1}^N (2T_i - 1)(1 + K_M(i))Y_i, \quad (1)$$

where  $T_i$  indicates whether the respondent viewed *Nuestro Barrio*,  $Y_i$  is the value of the outcome variable of interest for individual  $i$ , and  $K_M(i)$  is the number of treatment observations to which a given control group observation is matched (Abadie et al. 2004). Abadie and Imbens (2002) present a bias correction to this estimator to adjust for potential bias in small sample estimation.<sup>13</sup> We evaluate equation (1) using the measures of financial knowledge, attitudes, and behavior as the outcome variable  $Y_i$ .

While the PSM approach directly addresses the differences between samples in the observable characteristics, unobserved differences may

12. We also test other specifications of the matching estimator, examining the sensitivity of our results to choices regarding the number of matches, matching with or without replacement, requiring exact matching, and the use of the bias-corrected estimator. Estimation under these alternative specifications is generally similar to those reported.

13. We implement estimation of equation (1) using the `nnmatch` command in STATA9. We use the bias correction, match with replacement to one observation, and require exact matching with respect to the education and English ability variables. The covariates shown in Table 4 are otherwise used to identify the propensity score.

persist and result in sampling bias. In the attempt to evaluate the adequacy of the matching process, we directly test for unobserved differences in financial knowledge. The fourth financial measure—whether a deported homeowner loses possession of the home—is not addressed in *Nuestro Barrio*. Therefore, viewing *Nuestro Barrio* should not be associated with a higher likelihood of answering this question correctly, and this measure offers a test of the research design.

As a further test of the validity of the PSM results, we also use a second approach to identifying the impact of *Nuestro Barrio*. Where the PSM approach identifies differences between viewers and nonviewers in the matched sample, the number of episodes viewed offers an alternative measure of treatment receipt. Limiting the sample to the set of respondents who viewed at least one episode, this approach identifies the effect of viewing intensity on the set of outcome measures. We repeat the PSM analysis with this identification strategy using ordinary least squares/logistic regression. Because this approach limits the sample to *Nuestro Barrio* viewers, the estimated impacts should not be influenced by unobserved differences between samples.

## RESULTS

This section presents the results of the PSM estimator defined in equation (1) with respect to multiple measures of financial knowledge, attitudes, and behaviors. Interpretation of these results is limited by the small sample size available for analysis. Because only sixty-six *Nuestro Barrio* viewers are observed, the estimated effects reported may not be efficient reflections of the actual effect. While complete data are observed for all observations on the variables used to calculate respondents' propensity scores, several observations contain missing values for one or more of the outcome variables. Because of the small sample, we do not exclude these observations from all analyses. Instead, we exclude observations only from analyses in which data are missing on the specific outcome variable. The extent of such missingness never exceeds more than 6 percent of the sample (seven observations), and the majority of outcome measures do not suffer from any missing values. As a robustness test, we also estimate each model on the sample of observations with complete information on each outcome measure, finding no evidence that our results are sensitive to this treatment of missing data.

The reader should also be aware of one additional reduction to the sample. Six *Nuestro Barrio* viewers (9 percent) reported that they did not think it would ever be possible to own a home in the United States and are therefore not asked the processes of change questions with respect

to homeownership. Keeping these caveats in mind, we turn to analysis of the survey evidence.

Table 5 describes respondents' viewing habits. The first measure shows that 77 percent of respondents regularly watch telenovelas, a finding that reflects the popularity of telenovelas among Latino immigrants. The remaining measures of Table 5 describe the viewing habits of *Nuestro Barrio* viewers. Of the respondents who watched *Nuestro Barrio*, 91 percent viewed more than one episode and 47 percent watched five or more episodes. Over 62 percent of viewers had watched *Nuestro Barrio* within the previous month, and nearly all viewers had watched an episode in the previous six months. The fourth measure shows that the vast majority of viewers used the DVD to watch *Nuestro Barrio* episodes, although 18 percent of viewers had also seen episodes of *Nuestro Barrio* on television.

The final measure suggests that viewers responded positively to *Nuestro Barrio* relative to other competing programs. Ninety-seven percent of viewers said that they would sometimes prefer *Nuestro Barrio* over other programming, and 47 percent reported that they would always prefer to watch *Nuestro Barrio*. These frequencies suggest that the treatment group

TABLE 5  
*Nuestro Barrio Viewership*

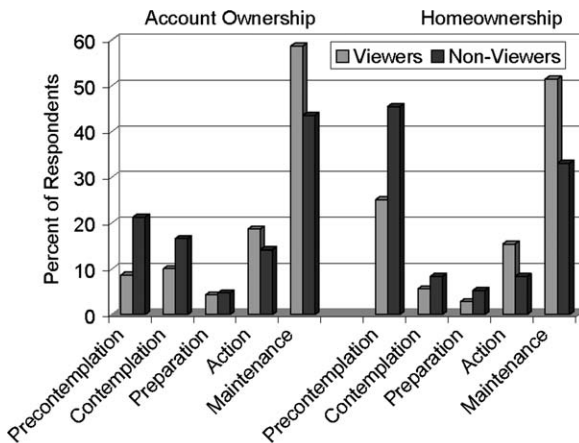
Variable	%
<b>All respondents (n = 155)</b>	
Regularly watch telenovelas	
Yes	76.6
No	23.4
<b>Viewers only (n = 66)</b>	
Number of episodes viewed	
1 or less	9.1
More than 1, but less than 5	43.9
More than 5, but less than 10	22.7
More than 10	24.2
Time since most recent viewing	
Within 1 month	62.1
1–5 months	31.8
6 or more months	6.1
Media	
Television	7.6
DVD	81.8
Both	10.6
Future preferences	
Prefer other programming	3.0
Watch <i>Nuestro Barrio</i> sometimes	50.0
Always prefer <i>Nuestro Barrio</i>	47.0

generally viewed several episodes of *Nuestro Barrio* and responded positively to its content. This evidence is descriptive but is suggestive about *Nuestro Barrio*'s entertainment value relative to other programs. This competitiveness for viewers is central to *Nuestro Barrio*'s attempt to reach viewers in all stages of behavior change.

Figure 1 shows the distribution of treatment and control group respondents across the stages of change with respect to both bank account ownership and homeownership. It should be emphasized that the distributions shown in Figure 1 reflect the unmatched treatment and control group samples. As a result, the differences between the distributions should be interpreted with care, particularly with respect to comparisons of treatment and control group members. With this caveat in mind, the distributions are useful in showing that the Latino immigrants surveyed were to be found at all stages of change with respect to both bank account use and homeownership, although some clustering existed in the precontemplation and maintenance stages for both actions.

Table 6 displays the estimated treatment effects with respect to bank account ownership. *Nuestro Barrio* viewers report significantly greater progress along the stages of change toward consistent account usage. Similarly, viewers are significantly more likely to exhibit the first processes of change. Additionally, the estimated treatment effect for each individual process of change is positive.

FIGURE 1  
*Distribution of Respondents across Stages of Change*



N=155

TABLE 6

*Treatment Effects for Account Ownership (Refer to Table 1 for Description of Outcome Measures)*

Outcome Variable	Coefficient	z Statistics
Stageac (account ownership stage)	.65*	2.23
Prac1 (consciousness raising)	.62*	2.46
Prac2 (consciousness raising)	.32	1.20
Prac3 (dramatic relief)	.38	1.15
Prac4 (environmental reevaluation)	.22	0.76
Prac5 (self-reevaluation)	.42	1.89

\* $p < .05$ .

Table 7 reports similar findings with respect to the measures for homeownership preparation. Nuestro Barrio viewers report significantly greater progress along the stages of change toward entering homeownership (defined as regularly saving for a down payment or building credit in preparation for homeownership). Viewers also have significantly higher scores on the measures of consciousness raising. Again, the coefficients on the other processes of change are positive, although not significant.

Interpretation of the processes of change effects requires reference to TTM theory. Previous analyses of the processes of change suggest that each process is associated with progress out of a specific stage, with individuals using different processes to make progress at different stages of the behavioral continuum. Ideally, the analyses would reflect these associations. Unfortunately, our sample size prevents analysis at this level of detail. Instead, the processes of change estimations identify whether viewing Nuestro Barrio triggers the process of interest among respondents across stages of the behavioral continuum. Interpreting the results in this way, the processes of change estimations suggest that Nuestro Barrio may be

TABLE 7

*Treatment Effects for Homeownership Preparation (Refer to Table 1 for Description of Outcome Measures)*

Outcome Variable	Coefficient	z Statistics
Stageho (homeownership stage)	.91*	2.59
Prho1 (consciousness raising)	.76*	2.84
Prho2 (consciousness raising)	.73*	3.02
Prho3 (dramatic relief)	.48	1.59
Prho5 (social liberation)	.19	0.75
Prho7 (self-liberation)	.27	0.96
Prho9 (reinforcement management)	.14	0.46

\* $p < .05$ .

particularly effective at raising viewers’ awareness. Nuestro Barrio viewers were significantly more likely than nonviewers to exhibit three of the four consciousness raising processes. This finding is consistent with Nuestro Barrio’s educational model, which seeks to reach out to viewers who might not otherwise seek out financial education.

We also examine the impact of Nuestro Barrio with respect to the measures of financial knowledge and financial attitudes shown in Tables 2 and 3. Table 8 reports the results of these analyses, with the first panel showing results with respect to financial knowledge and the second panel showing results with respect to financial attitudes. The results with respect to financial literacy do not show the consistent effects documented for the behavioral variables. The coefficient of .24 on the cumulative score (Lit1 + Lit2 + Lit3) implies that Nuestro Barrio viewers, on average, scored one-quarter of a point higher on the cumulative knowledge score than nonviewers. Of the individual knowledge questions, the third measure is positive and nears significance. However, none of the financial knowledge measures offers strong empirical evidence that Nuestro Barrio affects viewers’ knowledge of the financial topics presented.

The second panel of Table 8 presents estimation results with respect to the attitudinal measures. The cumulative attitudinal score is positive and significant, suggesting that viewing Nuestro Barrio is associated with greater comfort with banks and financial services providers. In particular, the second attitudinal measure—“I would feel comfortable asking a bank employee for advice”—is positive and significant, suggesting that Nuestro Barrio may increase viewer trust.

The fourth financial knowledge question—whether a deported homeowner loses ownership of their home—is included as a test of bias resulting from the sampling design. This measure was not included in Nuestro Barrio episodes and therefore should capture differences in the baseline financial

TABLE 8  
*Estimated Treatment Effects for Financial Knowledge and Attitudes (Refer to Tables 2 & 3 Description of Outcome Measures)*

Literacy			Attitudes		
Outcome Variable	Coefficient	z Statistics	Outcome Variable	Coefficient	z Statistics
Lit1	-.02	-0.21	Att1	.11	0.62
Lit2	.08	1.12	Att2	.41*	2.08
Lit3	.18	1.80	Att3	.17	0.70
Lit4	-.03	-0.23	Att4	.16	0.90
Littot (total score)	.24	1.52	Atttot (total score)	.83*	2.02

\**p* < .05.

knowledge of viewers and nonviewers. If *Nuestro Barrio* viewers carry higher financial literacy as a result of some unobserved characteristic rather than as a result of watching *Nuestro Barrio*, we would expect this measure to be positive. Instead, the estimate for this variable is not significant and is one of the few negative coefficients in Table 8. This result offers no evidence to suggest that the sampling design accounts for the observed differences between viewers and nonviewers. If anything, it suggests that the identified differences between viewers and nonviewers reflect the impact of *Nuestro Barrio* and not underlying differences between the viewers and the matched nonviewers.<sup>14</sup>

## DISCUSSION AND CONCLUSIONS

This article presents and discusses the financial education model underlying *Nuestro Barrio*, a Spanish-language telenovela designed to reach Latino immigrants with financial education. Initially run on network television in North Carolina, *Nuestro Barrio* attempts to attract viewers with its entertainment value as a telenovela while simultaneously providing financial education content. In examining *Nuestro Barrio*'s capacity as an educational tool, we rely on the TTM, which defines the stages individuals move through as they make incremental progress toward sustained behavior change. This theoretical framework for understanding behavior change is particularly relevant for comparing *Nuestro Barrio* with traditional financial education initiatives, as TTM recognizes that many individuals begin in precontemplation and may be unaware of a need to change.

*Nuestro Barrio*'s educational model seeks to use the telenovela delivery format to reach individuals who might not otherwise seek out financial education. By attracting viewers with its entertainment value, *Nuestro Barrio* may be uniquely able to reach viewers who are in precontemplation with respect to bank account use and/or homeownership. Because of the newness of TTM theory in research on consumers' financial behavior,

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14. As an additional precaution, we also repeat each analysis using two alternative definitions of treatment. First, treatment is defined as whether the respondent was recruited to the treatment sample, regardless of whether the respondent viewed any episodes. This specification is subject to the potential for sampling bias but robust to selection bias. Second, we limit the sample to the set of sixty-six viewers, defining treatment as the number of episodes viewed (see Table 5). While several differences exist between specifications, the results are remarkably consistent with those presented. This consistency across definitions of treatment provides further confidence that the analyses identify the effect of *Nuestro Barrio* and not sampling and/or selection bias.

further research is necessary to refine the application of TTM theory to financial behaviors. In pinpointing the mechanisms through which financial education impacts consumers' behaviors, such work carries the potential to improve financial education interventions. This caveat notwithstanding, TTM theory suggests that *Nuestro Barrio* and similar initiatives may offer an important contribution to financial education policy. In attempting to reach individuals who might not seek out traditional financial education, *Nuestro Barrio* may effectively supplement existing programs.

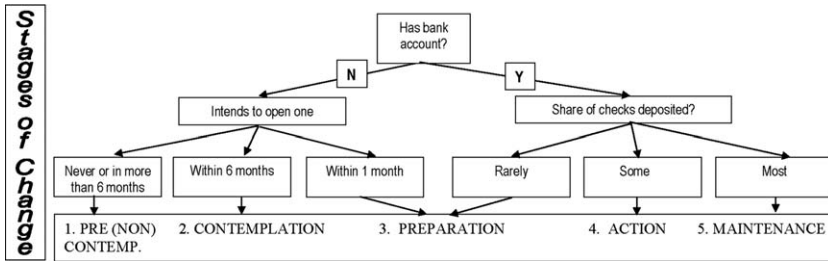
The empirical evidence presented in the survey evaluation supports this contention. While the small and geographically concentrated nature of the sample limits the strength and generalizability of the findings, the empirical analysis offers evidence that *Nuestro Barrio* effectively educates viewers. First, many of the Latino immigrants surveyed remained in precontemplation with respect to bank account use and homeownership, suggesting a need for greater outreach activities. Second, comparison of *Nuestro Barrio* viewers and nonviewers suggests that *Nuestro Barrio* may be effective both at raising awareness about the benefits of bank account use and homeownership and at altering viewers' attitudes toward banks. Further research is necessary to corroborate these findings for other financial education behaviors of interest. Nevertheless, the empirical evidence is consistent with *Nuestro Barrio's* intended role in financial education provision. To the extent that *Nuestro Barrio* is effective at reaching out to viewers who might not otherwise seek out financial education, it may complement existing financial education programs.

Consideration of *Nuestro Barrio's* educational model is useful not only for future attempts to provide tailored financial education to Latino immigrants but also for current efforts to expand the reach of financial education programs through the use of public service announcements, advertising campaigns, and other social marketing efforts. These initiatives rely on a similar delivery mechanism to communicate financial education content. Future research should examine the effectiveness of these programs at reaching unbanked individuals, underserved populations, and other groups that might not actively seek out financial education and/or mainstream financial services. To the extent that these initiatives raise individuals' awareness of the potential benefits of behavior change, they may also lead some individuals to seek out further financial education.

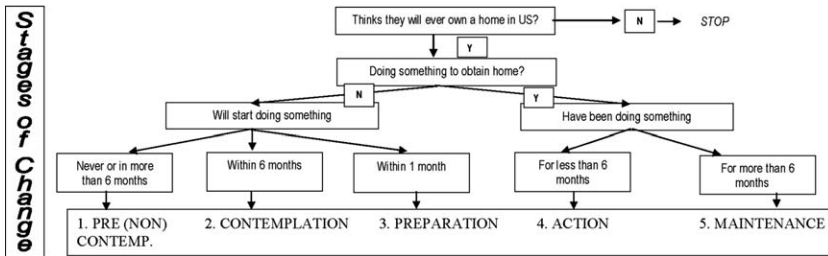
APPENDIX 1

Staging/Classification Algorithm for Stages of Change.

Action 1: Uses Bank Account



Action 2: Homeownership



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