



Evaluating consumer preferences for healthy eating from Community Kitchens in low-income urban areas: A discrete choice experiment of Comedores Populares in Peru

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ABSTRACT

Many low-income individuals from around the world rely on local food vendors for daily sustenance. These small vendors quickly provide convenient, low-priced, tasty foods, however, they may be low in nutritional value. These vendors serve as an opportunity to use established delivery channels to explore the introduction of healthier products, e.g. fresh salad and fruits, to low-income populations.

We sought to understand preferences for items prepared in *Comedores Populares* (CP), government-supported food vendors serving low-income Peruvians, to determine whether it would be feasible to introduce healthier items, specifically fruits and vegetables.

We used a best-worst discrete choice experiment (DCE) that allowed participants to select their favorite and least favorite option from a series of three hypothetical menus. The characteristics were derived from a series of formative qualitative interviews conducted previously in the CPs. We examined preferences for six characteristics: price, salad, soup, sides, meat and fruit.

A total of 432 individuals, from two districts in Lima, Peru responded to a discrete choice experiment and demographic survey in 2012. For the DCE, price contributed the most to individual's utility relative to the other attributes, with salad and soup following closely. Sides (e.g. rice and beans) were the least important. The willingness to pay for a meal with a large main course and salad was 2.6 Nuevos Soles, roughly a 1 Nuevo Sol increase from the average menu price, or USD \$0.32 dollars. The willingness to pay for a meal with fruit was 1.6 Nuevo Soles.

Overall, the perceived quality of service and food served in the CPs is high. The willingness to pay indicates that healthier additions to meals are feasible. Understanding consumer preferences can help policy makers design healthier meals in an organization with the potential to scale up to reach a considerable number of low-income families.

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1. Introduction

Many individuals from around the world rely on fast foods for daily meals, such as large chains in developed countries, or street vendors and small food stalls in low-income countries. The

consumption of less healthy fast food has grown as the numbers of urban poor in developing countries has also increased. Other factors associated with economic development have also increased reliance on cheap, quick meals, including longer commutes, longer work hours, and higher numbers of low paying jobs (Roever, 2006). The advantages of fast-food vendors include low prices, convenience, freeing time for leisure alternatives activities and the food usually tastes good. However, these foods may be high in fat, calories and salt, contributing to long-term health problems. One of the major risk factors for cardiovascular disease is obesity, and in

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Peru, nearly half the population is overweight and 16% are obese (WHO, 2011; Miranda et al., 2011).

Food assistance programs play a dual role in helping low-income individuals access food at lower prices, as well as trying to improve the nutritional quality of food. In Peru, Comedores Populares (Community Kitchens) provide subsidized meals for low-income individuals. This system is both an economic development and nutrition program, and is one of the main providers of food to low-income families. Low-income women established the CPs in 1978 in response to rising poverty (Benavides, 2005). In the early 2000s, this number grew to more than 15,500 Comedores Populares in Peru, and a third are in Lima, the country's capital city (Blondet and Trivelli, 2004). Nearly 100,000 women cook meals for roughly 6% of Lima residents (Blondet and Trivelli, 2004). The national food assistance program (PRONAA) used to subsidize about 30% of the ingredients such as rice, legumes (e.g. beans), oil and canned fish (Alcázar, 2004), but now the local municipalities subsidize the meals. Any additional items are purchased with daily sales revenues.

Other research in Peru has shown that individuals on food assistance programs have a higher prevalence of obesity, and the consumption of fast foods is high and the consumption of fruits and vegetables is low among the urban poor in Lima. The meals served in the CPs rarely contain fruits or fresh vegetables and are high in carbohydrates (Chaparro et al., 2014; Ministerio de Salud: Lima, 2006; Grupo de Opinión Pública, 2009). Portions of food served in CPs are usually excessive, particularly in the cheaper items such as rice, beans, potatoes or noodles, and because they are intended to serve multiple family members. While the items themselves are prepared fresh daily in each CP, they are high in carbohydrates and it is unclear the extent to which the CP meals may be high in salt or fat. They could be potentially lower in fat than deep-fried fast foods. The prices are also very low because of the government subsidy. From about 1.5 Peruvian Nuevos Soles, the basic meal usually consists of a soup with some other side item like rice, beans, potatoes or pasta. Only occasionally is there meat, and almost never are there fruits and fresh vegetables. Prices can vary as CPs are run independently by the local communities and some members pay lower prices than others. There is also wide variation in the quantity and quality of the meals, but common to almost all CPs is the lack of fruits and fresh vegetables.

Due to the existing lack of fruits and fresh vegetables across the CPs in terms of meal preparations, it is difficult to understand preferences for healthier foods among the low-income using observational data. Discrete choice experiments (DCE) are a useful way to provide stated preferences for hypothetical choices, before they are implemented. They have been used previously to determine preferences for food products (Louviere, 1984; Loureiro and Umberger, 2007) and more recently in obesity prevention (Grisolia et al., 2013). We contribute to the literature not only on the topic of nutritional food programs and their impact on obesity, but also in applying a multi-profile best-worst version of a DCE to this context. While DCEs have been used in many applications in health (e.g. Ryan and Gerard, 2003; Lancsar and Louviere, 2008), few multi-profile case best-worst experiments have been conducted, though interest in them is growing (Fiebig et al., 2011; Potoglou et al., 2011; Yoo and Doiron, 2013).

The objective of this study was to understand preferences for elements of meals prepared in CPs, to understand whether it would be feasible to introduce healthier items such as fruits and vegetables, to low-income populations. The results of this study will inform a nutritional intervention for the CPs as part of a larger project to improve nutrition among Peru's urban low-income residents.

2. Methods

2.1. Experiment overview

We conducted a multi-profile case best-worst scaling experiment among low-income customers of CPs in two districts in Lima, Peru. The best-worst types of DCE allow for a complete ranking of choices, and therefore elicits more preference information than if each respondent had only picked their first choice (Lancsar et al., 2013). These types of DCEs are called a 'case 3' type to differentiate them from other best-worst analyses that ask respondents to select among levels of particular characteristics (cases 1 and 2), rather than full products such as a food menu (Flynn, 2010). Respondents in our study selected their favorite, then least favorite option from three menus (profiles) presented. The characteristics of the menus were selected after a qualitative component with users and cooks in the CPs that is explained in greater detail below. After the experiment, the respondents also answered a demographic questionnaire that included a variety of opinion questions on the CPs. The institutional review board of Universidad Peruana Cayetano Heredia in Lima, Peru approved this study.

2.2. Attribute development

The menu characteristics for this study derive from a series of qualitative interviews conducted as part of the first stage of the project. The qualitative study aimed to understand suppliers' and consumers' current practices and views in relation to what foods are being purchased, prepared and offered; what factors are most influential in defining the menus; and, what are the most and least valued characteristics of Comedores Populares. The study was conducted and completed between July and December 2012.

The qualitative component of the study included visit to four Comedores Populares, two in San Juan de Miraflores and two in Cercado de Lima. The collection of data incorporated interviews to members of the CPs, current consumers and nearby residents who do not use the CPs. In total, 20 members of Comedores, 24 regular consumers, and eight residents but non-users of Comedores were interviewed. It also incorporated information on four in-depth observations of Comedores, daily from 8:00a-3:00p, with durations of 5 days.

During the qualitative interviews, we confirmed that fruits and fresh vegetables were absent of CP's menus but were highly valued by both members and consumers, so we included these as attributes in the DCE. The other attributes selected represent the basic elements served in the CP meals such as soup, rice and beans. Meat is also highly valued, but is offered less often so this was also included as a menu item in the DCE. CP members and consumers did not perceive that CP menus were high in fat or sodium so these attributes were not included in the DCE experiment.

We examined preferences for six characteristics: price, salad, soup, sides (rice and beans), meat and fruit. The levels were none (for some), small, medium (for some) and large portions for the food characteristics and 1.5, 3 and 6 soles for the price (Table 1). The lowest price level represents approximately the current cost of the meals, though we acknowledge that some consumers can face different prices. The upper price levels are designed to measure whether there is an increased willingness to pay for additional items such as fruit or salad.

2.3. Choice task

The respondents were recruited and surveyed in May and June 2013. Customers in the sample were invited to participate consecutively from 24 CPs in Cercado de Lima, and 24 CPs in San Juan de

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