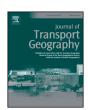
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### Journal of Transport Geography

journal homepage: www.elsevier.com/locate/jtrangeo



## Ethnic neighborhoods, social networks, and inter-household carpooling: A comparison across ethnic minority groups



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#### ARTICLE INFO

Article history: Received 29 January 2016 Received in revised form 26 April 2016 Accepted 8 January 2017 Available online xxxx

#### ABSTRACT

The implications of racial residential segregation on travel behavior have remained understudied, despite the persistent existence of segregation. Using the 2009 National Household Travel Survey, I investigate whether residence in a co-ethnic neighborhood affects the likelihood that ethnic minorities will form inter-household carpools, and if so, how such effects differ across race or ethnic groups. Inter-household carpooling requires arrangements and interactions between people living in geographical proximity, so it will likely reflect the social networks of a neighborhood. The results show that Hispanics and Asians who reside in their co-ethnic neighborhoods, regardless of immigrant status, are more likely to use inter-household carpools for non-work purposes than their counterparts living outside co-ethnic neighborhoods. In contrast, black neighborhood residency is not associated with the likelihood that African Americans will do inter-household carpooling, regardless of trip purpose. These differences across racial/ethnic groups suggest that the role of neighborhoods in promoting social ties as reflected by activities such as external carpooling is complex. Residence in a black neighborhood may be less of a choice than residence in a Hispanic or Asian neighborhood due to the long history of black segregation in the US. With less residential choice, the propensity to develop local social ties may be weaker.

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#### 1. Introduction

Although residential segregation between whites and African Americans has decreased over time, most large U.S. metropolitan areas are still characterized by high segregation levels (Iceland et al., 2013). In 2010, the average level of black-white segregation for major U.S. metropolitan areas was about 55-that is, almost 55% of African Americans would need to relocate in order to be entirely integrated with white populations (Frey, 2011). The segregation levels between whites and Hispanics and between whites and Asians are relatively low in comparison to the figure for African Americans (44 for Hispanics, 40 for Asian), but they have increased slightly or remained similar over the last several decades with continuing immigration (Frey, 2011). As the spatial separation between whites and ethnic minorities has been a long-standing issue, the consequences of racial residential segregation have been widely researched in the academic literature: the main focus points are labor market outcomes (for a literature review, see Ihlanfeldt and Sjoquist, 1998; Preston and McLafferty, 1999), health outcomes (Williams and Collins, 2001; Acevedo-Garcia et al., 2003; Kramer and Hogue, 2009) and educational outcomes (Card and Rothstein, 2007; Quillian, 2014). However, the role of racial residential segregation in

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shaping transportation-related decisions among ethnic minorities has received scant attention.

Previous research on travel behavior suggests that the social environment and social networks play a crucial role in people's travel behavior (Carrasco and Miller, 2006; Roy et al., 2012; Maness et al., 2015). Ethnic neighborhoods offer a distinct social environment for those who live there; especially, those whose ethnicity is the same as the ethnic characteristics of the neighborhood. They are physically close to coethnics who share the same language and cultural background, which might facilitate the formation of social networks (Charles and Kline, 2006). This environment will also likely affect the probability of interhousehold carpooling, because such ways of traveling, especially those for non-work-trip purposes, require social networks among people who live close to one another. For instance, Liu and Painter (2012) is one study that found a positive relationship between co-ethnic neighborhood residency and the likelihood of Latino immigrant carpooling for commutes. Yet, an investigation of such a relationship among native-born ethnic minorities has been lacking. In addition, differences in the effects of co-ethnic neighborhood residency across racial/ethnic groups remain unclear. The literature on racial residential segregation has suggested that the causes behind the formation of ethnic neighborhoods and the resultant characteristics of those neighborhoods seem to differ by race/ethnicity (Charles, 2000; Emerson et al., 2001). Hence, these differences may have implications for residents' travel behavior in different ethnic neighborhoods.

The goal of this study is to help fill a gap in the existing literature. Using the 2009 National Household Travel Survey (NHTS), I investigate how residence in co-ethnic neighborhoods influences the likelihood of inter-household carpooling among ethnic minorities and how the effects of such co-ethnic neighborhoods differ across race/ethnicity and immigrant status. This study also aims to identify other determinants of inter-household carpooling among ethnic minority groups. Interhousehold carpooling is an important means of transportation for ethnic minorities: it accounts for nearly 15% of person trips for this population segment—more than five times the number of trips made using public transportation (2009 NHTS). Given the limited attention to inter-household carpooling in association with the social environment, the findings of this study will help provide suggestions for effective policy interventions aimed at increasing ridesharing across households and implications for future studies.

The next section of this paper provides a review of the literature on race/ethnicity and travel behavior, and ethnic neighborhoods and social networks. Section 3 describes the data sets and research strategy and Section 4 presents the empirical analyses on the travel mode choices of ethnic minority groups. Section 5 discusses in detail the relationship between co-ethnic neighborhoods and inter-household carpooling. The paper concludes in Section 6 with a summary of study results and policy implications.

#### 2. Previous research and research hypotheses

#### 2.1. Race/ethnicity and travel behavior

The relationship between race/ethnicity and travel behavior has been the focus of several empirical studies that have investigated differences between the travel patterns of white populations versus those of other racial ethnic groups (Ibipo, 1995; Giuliano, 2003; Pucher and Renne, 2003). However, despite these empirical findings of racial differences in travel behavior, efforts to understand such differences and to develop theoretical discussions have been lagging. One strand of literature on the spatial mismatch hypothesis has attempted to explain longer commutes among ethnic minorities as related to their residential location and commute modes, but the focus has been on commutes without considering non-work travel behavior (Ibipo, 1995; Taylor and Ong, 1995; Sultana, 2005).

One of the most relevant theories that may help explain racial/ethnic differences in non-work travel behavior is the leisure segregation theory. Developed to explain racial variations in leisure behavior, it has revolved around the marginality and ethnicity hypotheses (Floyd, 1998). The marginal hypothesis attributes racial variations in leisure behavior to ethnic minorities' marginal socio-economic conditions, which are explained, in turn, by social structural barriers (Washburne, 1978). Previous studies have tended to operationalize marginality as socio-economic characteristics, such as limited household income and vehicle availability (Floyd, 1998). However, the ethnicity hypothesis views the cultural differences commonly operationalized by racial variables in empirical studies as a determinant of interracial differences in leisure behavior (Allison, 1988; Floyd et al., 1994).

Past studies of race/ethnicity and travel behavior have found results that are in line with the marginality and ethnicity hypotheses. The general findings of previous studies show that auto ownership and income are relatively low among ethnic minority groups when compared to whites, which partly explains the higher reliance on alternative modes of transportation for both non-work and work purposes among ethnic minorities (Blumenberg et al., 2007). Yet, after adjustments for socioeconomic status, race/ethnicity still plays a role in travel behavior for reasons that are unclear (Giuliano, 2003; Smart, 2010).

However, there has been little theoretical discussion of racial/ethnic differences in travel behavior across ethnic minority groups, as previous studies concentrated on the comparison between whites and ethnic minority groups, especially between white and blacks. Thus, the current

study attempts to explain differences in factors that affect carpooling behavior across ethnic minority groups based on a theoretical framework of segregation and social networks.

#### 2.2. Residential segregation, social networks, and carpooling

Substantial discussions have centered on how segregated neighborhoods affect social networks and urban inequality, but most have revolved around job searching networks related to social mobility among ethnic minorities (Reingold, 1999; Elliott and Sims, 2001). This line of literature has demonstrated that African Americans living in segregated black neighborhoods suffer from lack of job networks which help their job acquisitions (Kirschenman and Neckerman, 1991; Smith, 2005). More recent findings, however, suggest that "co-ethnic neighborhood effects" on job networking might differ by racial/ethnic group; Hispanic or Asian neighborhoods, for example, as opposed to black neighborhoods, often provide ethnic-based information networks that help residents to secure employment (Wilson and Portes, 1980; Bailey and Waldinger, 1991). This mechanism seems more prevalent among immigrants, who are likely to rely heavily on localized and informal networks to find employment opportunities because of their legal status and limited English ability (Elliott, 2001).

Despite the relative lack of attention paid to social support networks in the fields of geography and planning, they are an important type of social tie. Social support networks—often related to strong ties—comprise ties that aid people in handling their daily tasks (Briggs, 1998). Social support networks are distinct from job information networks, because an individuals' socio-economic status is not as relevant in social support networks as in job information networks. For example, it is possible that a low-income friend might provide better child care than a high-income friend. In addition, unlike job information networks, which may be affected by such demand factors as racial discrimination among employers, social support networks are less likely to be hampered in their formation by external factors. In their investigation of social support networks among ethnic minorities, Dominguez and Watkins (2003)-even though they did not explicitly focus on racial differences-suggested that African Americans may rely on institution-based social support networks whereas Latin Americans tend to rely on family- or friendship-based social support networks—a phenomenon similar to jobnetworking. Several other studies have found racial differences in social support networks including network size and composition, but results are mixed (Kim and McKenry, 1998; Small, 2007). Furthermore, these studies have not clarified how neighborhood conditions, especially residence in co-ethnic neighborhoods, influence social support networks among ethnic minorities.

The literature on racial residential segregation suggests that the effects of co-ethnic neighborhood residency on social support networks may not be the same across racial/ethnic groups because of different causes of racial residential segregation and the resultant neighborhood characteristics. Studies have found fairly consistent evidence that African Americans continue to experience racial discrimination in the housing market, although it is more subtle than it used to be (Yinger, 1995; Massey and Lundy, 2001; Dawkins, 2004). There is little evidence to suggest that racial segregation is the result of preferences of African Americans to live in black neighborhoods. Even studies that found evidence of black self-segregation revealed that it seemed to play only a minor role in explaining black segregation (Zubrinsky and Bobo, 1996; Ihlanfeldt and Scafidi, 2002).

Whereas other such racial groups as Hispanics and Asians also tend to be segregated from whites, the causes of segregation may differ fundamentally from reasons for black-white segregation. For example, many studies have demonstrated that, compared to African Americans, Hispanics and Asians are more likely to self-segregate because they prefer to live with co-ethnics (Zubrinsky and Bobo, 1996; Nguyen, 2004). The ethnic enclave hypothesis supports this argument, as it posits that

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