EMOTIONS, SELF-EFFICACY, AND OPPORTUNITY BELIEFS IN AMERICAN NEIGHBORHOODS

by

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ABSTRACT

TENGTENG CAI. Emotions, Self-Efficacy, and Opportunity Beliefs in American Neighborhoods. (Under the direction of STEPHANIE MOLLER)

Subjective perceptions of social mobility are critical for defending societal system and maintain political stability (Day and Fiske 2017; Houle 2019). This dissertation enhances our understanding of factors that shape beliefs in opportunity for upward mobility by focusing on the living environments in American neighborhoods. Inspired by the research from psychology and development economics, I developed and tested the Opportunity Beliefs Theory to explain how the built environment in neighborhoods affects individuals' opportunity beliefs. The theory aims to elucidate how environmental factors psychologically affect people's beliefs and behavior. The Opportunity Beliefs theory argues that the living environment can rouse positive or negative emotions. The emotional incentives shape residents' self-efficacy. These emotions and self-efficacy largely affect people's expectations for the future. According to the Opportunity Beliefs Theory, for people with low/middle income, those who live in a neighborhood with a better-maintained built environment are more likely to possess positive emotions and hold a high-level of self-efficacy. Furthermore, these residents will perceive more opportunities for themselves and their children for getting ahead in life, and they are more likely to agree that the opportunities are distributed equally in the society.

I have designed three studies which can support each other to explore the valid causal inferences between the built environment in neighborhoods and opportunity beliefs. First, in order to understand how the built environment in neighborhoods affects Americans' opportunity beliefs, I designed a conventional survey which has a nation-wide sample and a high level of

external validity. Next, I conducted two-round survey experiments to explore the causal inference. The results support my hypotheses.

This dissertation explores the interaction between the living environment and human psychological states and enriches the knowledge of emotions, self-efficacy, and opportunity beliefs. This research has important implications for neighborhood revitalization, neighborhood governance, public health, poverty reduction and redistributive policy.

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DEDICATION

To my grandfather, Jizhang Cai, who always spoiled me. Your infinite love will support me forever. I hope you are proud of me.

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CHAPTER 1 INTRODUCTION

The expanding income gap between the rich and poor has become a serious concern for policy-makers and scholars, because it may cause inferior health and well-being, create social conflict and lower levels of social cohesion, and exert negative influences on economic productivity, political stability, and legitimation. Social mobility plays an important role in increasing the tolerance for income inequality (Shariff, Wiwad, and Aknin 2016). However, current literature has demonstrated that people's perceived social mobility is different from objective measurements of social mobility (Kraus and Tan 2015; Chambers, Swan, and Heesacker 2015; Swan, Chambers, Heesacker, and Nero 2017; Schuck and Shore 2019). Individual and group expectations about social mobility can moderate the tensions among social groups caused by income inequality (Hirschman and Rothschild 1973; Sagioglou, Forstmann, and Greitemeyer 2019), while low perceived social mobility can reduce the defense of the overarching societal system and fuel political instability (Day and Fiske 2017; Houle 2019). For example, both the "tunnel effect" theory (Hirschman and Rothschild 1973) and "Prospect for Upward Mobility (POUM)" hypothesis (Bénabou and Ok 2001) posit that if individuals perceive an opportunity of future upward mobility, they have more tolerance of current inequality. Scholars have argued that Americans have a unique degree of enduring present inequalities because of their beliefs in the promise of future success, either for themselves or for their children (Lipset and Bendix 1959; Lipset 1996).

Perceived social mobility also affects people's opinions about fairness and justice of the social system. The negative influence from inequality on people's life satisfaction or happiness is primarily due to their concerns of fairness. But the negative effect of inequality is partially mediated by people's perceived social mobility (Ugur 2021). Furthermore, perceived social

mobility is closely related with the support for meritocracy. If people attribute meritocratic factors, such as hard work, in determining who gets ahead in society, instead of non-meritocratic causes, such as family wealth, then they believe in meritocracy. Believing in meritocracy can relieve concerns of expanding income gaps since people agree that the income gap is meritocratically deserved (Mijs 2021). Additionally, people from a low status group with meritocratic beliefs tend to justify both personal and group disadvantage and justify the status inequalities (McCoy and Major 2007).

Subjective perceptions of social mobility also influence people's supports for distribution and redistribution policies. For instance, Jaime-Castillo and Marqués-Perales (2014) develop a new method to measure the beliefs about equality of opportunities by asking respondents in Spain to estimate the probability of reaching the service class from various social classes. They find that if people think the initial distribution of opportunities was unfair, people will support greater government responsibility. Lee (2016) finds that Koreans who have a negative perception of equal opportunity in society demand more distribution. Kim and Lee (2018) analyze data from 28 countries and found that high levels of perceptions of inequality of opportunity will weaken the relationship between individual's socioeconomic status and attitudes towards redistribution. In other words, when people recognized the opportunities were distributed unequally in the society, they would support redistribution policies, even contrary to their own self-interest. The impact of shared perceptions of inequality of opportunity is also significant at the country level. Furthermore, previous research has found that ideology has a moderating effect on the relation between individuals' subjective perceptions of social mobility and redistributive preferences. Generally, liberal people are more likely to support redistribution if they perceive low social intergenerational mobility. In contrast, the impact does not exist among conservative people

(Alesina, Stantcheva, and Teso 2018; Alesina and Angeletos 2005; Bénabou and Tirole 2006; Jost, Federico, and Napier 2009; Piketty 1995). However, for intragenerational mobility, conservative people's support for redistribution changes negatively along with their expected upward income mobility, while liberal people support redistribution regardless of their expectations of social mobility (Laméris, Garretsen, and Jong-A-Pin 2020).

Because of its critical role in maintaining social and political stability, perceived social mobility deserves more attention. Perceived social mobility is examined from two aspects in this dissertation, the perceptions of opportunity and the perceptions of (in)equality of opportunity. First, the perceptions of opportunities for getting ahead in life reflect an individual's expectation of intra-/inter-generational upward mobility. These perceptions of opportunity are related to income inequality, support for redistribution, or well-being (Rytina, Form, and Pease 1970; Alesina, Tella, and MacCulloch 2004; McCall et al. 2017; Esping-Andersen and Nedoluzhko 2017, etc.). Second, perceptions of equality of opportunity reflect how people understand social structure, evaluate social fluidity, and assess the distribution of opportunities in the society. The perceptions of equality of opportunity affect individuals' status justice evaluations (Oddsson and Bernburg 2018). I collectively refer to perceptions of opportunity and perceptions of (in)equality of opportunity as Opportunity Beliefs.

This research will enhance our understanding of factors that shape beliefs in opportunity for upward mobility. While prior research has established that individual characteristics, such as race, gender, personal experiences, or national-level factors, such as economic development, impact people's opportunity beliefs, less is known about the impact of the physical environment. This research focuses on the living environment and argues that the visibility of physical environment in people's daily lives significantly impacts people's opportunity beliefs via the

mechanisms of emotions and self-efficacy. Specifically, this research takes a novel perspective and seeks to establish a psychological theory for understanding the role of the built environment of a neighborhood in affecting residents' perceived social mobility. Various quantitative methods have been employed to empirically test the hypotheses based on the theory. Methodological triangulation improves the validity of the research. Furthermore, this research also investigates the impact of the built environment on residents from different demographic groups, such as gender, race, education, etc., and explores the effects on people from diverse political communities.

The dissertation is organized as follows. Chapter 2 provides a thorough review two key concepts of the Opportunity Beliefs Theory, perceptions of opportunity and perceptions of (in)equality of opportunity. Chapter 3 builds up and elaborates the Opportunity Beliefs Theory to explore the causation between the physical environment and both people's perceptions of opportunity and perceptions of (in)equality of opportunity. This chapter also details the role of the mediator in the causal link between the physical environment and individuals' opportunity beliefs. Chapter 4 illustrates the methodological approaches employed by this research. Analyses utilize original data collected through a national survey and two-round survey experiments to detect causality and investigate causal mechanisms. Chapter 5 presents results from the observational survey. Chapters 6 and 7 report the results from the two survey experiments. Chapter 8 presents conclusions with policy implications and suggestions for future research.

CHAPTER 2 LITERATURE REVIEW

2.1 Perceptions of Opportunity

In this research, the concept of perceptions of opportunity is defined as the expectations for upward mobility in the future, either for individuals themselves or for their children. The perceptions of prospective upward mobility are measured by individuals' anticipations for higher income, higher education attainment, and higher social status. The valuation of upward mobility in the future is actually the assessment of resources one can access. The assessment is based on self-evaluations, such as one's talents, abilities, family background, etc., and the acknowledgement of social environment, such as norms, policies, etc.

Scholars have identified various factors that influence perceptions of opportunity. I will discuss them from two threads, perceptions of occupational opportunity and perceptions of educational opportunity.[1] Many studies have explored them together (Xie and Goyette 2003; Lent, Brown, and Hackett 1994; 2000; Sewell, Haller, and Portes 1969; Sewell, Haller, and Ohlendorf 1970). The two threads of perceptions of opportunity are different but closely related (Xie and Goyette 2003).

[1] According to Haller et al. (1974), a person's level of occupational aspiration (LOA) is "a limited range of points on the occupational prestige hierarchy which he views desirable or possible for himself." The range has its higher and lower bounds. The two bounds are idealistic LOAs (so-called "*aspirations*") and realistic LOAs (so-called "*expectations*"). Both of them are meaningful. Though usually the idealistic level is higher than the realistic level, idealistic LOAs and realistic LOAs are correlated (Haller et al. 1974; Haller and Miller 1971). I argue that both the idealistic and realistic LOAs represent the perceptions of occupational opportunity. Likewise, both the idealistic and realistic levels of educational aspiration (LEA) are considered as the perceptions of educational opportunity. Therefore, the aspiration and expectation are not distinguished in this literature review and can be used interchangeably.

2.1.1 Perceptions of Occupational Opportunity

Occupation is the principal indicator of family social status (Otto 1975). Perceptions of occupational opportunity play a vital role in influencing individuals' occupational attainment, educational expectation, and educational attainment (Schoon 2001; Mello 2008; Schoon and Polek 2011; Kuvlesky and Bealer 1967; Xie and Goyette 2003; Powers and Wojtkiewicz 2004, etc.). A large number of studies have explored the predictors of perceptions of occupational opportunity. According to social cognitive career theory (Lent, Brown, and Hackett 1994; 2000), person inputs, such as predispositions, gender, race, and health status, will affect the perceptions of opportunities. Social cognitive career theory is anchored in Brandura's (1986) general social cognitive theory, which posits that there exist reciprocal causations among personal, behavioral and environmental determinants, and is combined with other theoretical sources such as Astin's (1984) the perceived "opportunity structure" and Vondracek, Lerner, and Schulenberg's (1986) "contextual affordance" concept which both emphasize individual interpretation for a specific environment of the "opportunities, resources, barriers or affordances" (Lent, Brown, and Hackett 2000). Social cognitive career theory focuses on self-efficacy, expected outcome, and goal mechanism, and how these variables interact with other personal (e.g., gender and race), contextual (e.g., social supports and barriers), and experiential factors, to form career-relevant interests, academic and career options selections, and educational and occupational performance. Social cognitive career theory argues that the perceptions of opportunities is a moderator between person inputs with the goals and actions (Lent, Brown, and Hackett 1994; 2000).

Previous literature has identified various personal elements which affect people's perceptions of occupational opportunities. For example, researchers have found that race and gender play important roles in forming people's perceptions of occupational opportunity. On the whole,

minority ethnic groups and women perceive more hurdles but less opportunities for their job acquisition and career development (Turner and Turner 1975; Taylor, Charlton, and Ranyard 2012; Chung and Harmon 1999; Chen and Fouad 2013, etc.).

Besides race and gender, age also plays an essential role in affecting individuals' occupational aspiration. According to Jacobs, Karen, and McClelland (1991), occupational aspirations decline with age among young men. In addition, social class and socio-economic status impact individuals' perceived opportunities and their vocational choices (Liu and Ali 2005; Blustein et al. 2002). Typically, income, education, and occupation are used to stratify people into different socio-economic groups (Liu and Ali 2005). Education-related factors, such as self-ratings of ability and test scores in mathematics, also have a relationship with individuals' job aspirations (Schoon 2001).

Moreover, according to social cognitive career theory (Lent, Brown, and Hackett 1994; 2000), self-efficacy affects individuals outcome expectations. Previous studies have empirically tested and supported the argument that self-efficacy has important influence on people's career decision-making process (Ali, McWhirter, and Chronister 2005; Tang, Fouad, and Smith 1999). Based on Bandura's (1977a, 1977b) social learning theory, Hackett and Betz (1981) and Betz and Hackett (1981) develop the career-related self-efficacy and apply it to explain why women can't fully realize their capabilities and talents in their vocational developments. They (Betz and Hackett 1981) find that women express higher levels of self-efficacy towards traditional occupations and lower levels of self-efficacy for nontraditional occupations, while men do not present significant difference between levels of self-efficacy with regard to traditional or nontraditional occupations.

Furthermore, contextual factors play a role in affecting people's perceptions of occupational opportunity. Astin (1984) asserts that the early socialization process contributes to the formation of people's perceptions of opportunity, but the perceptions of opportunity are not stable throughout individuals' lifetime and may be modified when there are changes in the structure of opportunity. There exist interactive influences between the socialization process and the opportunity structure (Astin 1984). Family is a principal socialization agent (Parsons and Bales 1955). Hence, teenagers' job aspirations are related to peer and sibling support (Ali, McWhirter, and Chronister 2005), parental education and occupation (Schoon 2001; Burlin 1976), parents' values and behaviors (Jodl et al. 2001), and family structure (Sigal et al. 2012). Moreover, previous literature also finds that teenagers' job aspirations are affected by teacher-ratings and school environments (Schoon 2001).

2.1.2 Perceptions of Educational Opportunity

Education is human capital and positively affects individuals' employments and earnings (Elman and O'Rand 2004; Morris and Western 1999; Murphy and Welch 1994). Previous literature has taken teens' educational expectation as a measure of their perceptions of opportunities (Driscoll et al. 2005). Educational expectations are important because they affect individuals' educational attainment (e.g., Andrew and Hauser 2011; Sewell, Haller and Portes 1969; Holtmann, Menze, and Solga 2021; Mello 2008), adolescent birth rates (e.g., Driscoll et al. 2005; Mireles-Rios and Romo 2014; Beutel 2000), and occupational aspiration (e.g., Schmitt-Wilson 2013; Inoue 1999; Goyette 2008). Thus, the expectation for higher educational attainment is also incorporated as one of the indicators of perceptions of upward mobility in this research.

According to Morgan (1998), educational expectations are "generated from rational calculations of the costs and benefits of educational training" and they are under constant revision when faces with new information. As I mentioned in the previous section of perceptions of occupational opportunity, social cognitive career theory (Lent, Brown, and Hackett 1994; 2000) also applies to the perceptions of educational opportunity. Thus, the person inputs listed above, including predispositions, gender, race, or health status, affect the perceptions of educational opportunity as well. Students' perceptions of educational opportunity vary among different social categories of gender, race, and ethnicity (Wood, Kaplan, and McLoyd 2007; Davis and Pearce 2007; Wells et al. 2011; Cheng and Starks 2002; Bohon, Johnson, and Gorman 2006; Lawson et al. 2020, etc.). Additionally, individuals' occupational expectations influence their educational expectation. Xie and Goyette (2003) finds a strong relationship between people's perceived educational requirement and expected educational level, which indicates that students' educational expectations are based on their occupational expectations.

Again, social cognitive career theory (Lent, Brown, and Hackett 1994; 2000) states that self-efficacy is related to students' educational expectation. Multon, Brown and Lent (1991) conduct a meta-analyses and facilitate the argument that self-efficacy is robust in predicting academic performance, success and persistence (Brown, Lent, and Larkin 1989; Lent, Brown, and Larkin 1984, 1986; 1987; Siegel, Galassi, and Ware 1985; Burns et al. 2021). Numerous empirical studies have supported the proposition that self-efficacy significantly and substantially affects outcome expectations (Liu et al. 2020; Zysberg and Schwabsky 2020; Lent and Brown 2019; Lent et al. 2018, etc.).

Though multiple factors may affect the perceptions of educational opportunity, the Wisconsin model of status attainment (Sewell, Haller, and Portes 1969; Sewell, Haller, and Ohlendorf 1970)

and rational choice theory (Breen and Goldthorpe 1997; Van De Werfhorst and Hofstede 2007; Gabay-Egozi, Shavit and Yaish, 2010; Barone, Triventi and Assirelli, 2018) are two main theories discussed and empirically tested to explain the formation of the perceptions of educational opportunity. Empirical research has indicated that both theories can independently explain class differentials in student educational aspirations (Zimmermann 2020). The two theories have explored the relationship between social class origins and level of educational aspirations, but the causal mechanisms between the two elements are different. Wisconsin model of status attainment focuses on the contextual factors and examines the mediation effects of levels of aspiration between significant others' influence and attainment. Significant others are "the persons exerting the greatest influence upon him," such as parents, teachers, and friends (Sewell, Haller, and Ohlendorf 1970). It assumes that predetermined social structural and psychological factors affect students' academic performance and the significant others' influence on them, then the significant others' influence and their own ability affect their levels of occupational and educational aspiration, and then affect occupational and educational status attainment[2] (Sewell, Haller, and Portes 1969; Sewell, Haller, and Ohlendorf 1970). The contextual factors' impact on perceptions of educational opportunity has been empirically tested and supported by a number of studies. Students' educational expectations are highly affected by significant others, including parents, teachers, close relatives, and friends (e.g., Cheng and Starks 2002; Kretschmer and Roth 2021; Lorenz et al. 2020).

Rational choice theory also explores how social class affects perceptions of educational opportunity. Different from the Wisconsin model of status attainment, the rational choice theory puts forward the relative risk aversion mechanism and argues that families in different classes

[2] Sewell, Haller, and Ohlendorf (1970) presents that variables in the WIM model other than educational attainment only moderately causes occupational attainment.

seek to ensure that their children can at least secure the class position where they originate and avoid downward social mobility (Breen and Goldthorpe 1997; Goldthorpe 1996). Parents' social position is a reference for their children's aspirations. To ensure the class maintenance, students and families need to weigh the costs and benefits of educational options when they make the educational decisions. Staying in the educational system longer costs less and benefits more for children of higher social class origins (Breen and Goldthorpe 1997; Van De Werfhorst and Hofstede 2007).

Though both the WIM and RCT argue that social class origins impact students' educational aspiration, other scholars have also found that the impact decreases overtime. For example, Goyette (2008) notices that there has been a substantial increase in the levels of educational expectation of a bachelor's degree from 1980 to 2002, but that compared to cohorts in 1980, students' educational expectations in 2002 are more loosely linked to social background. She (Goyette 2008) argues that this is because the expectation of attaining a bachelor's degree has become the norm for all young adults regardless of their social background.

2.1.3 Neighborhood Effects on Perceptions of Opportunity

Prior research has primarily explored micro-level determinants of perceptions of opportunity, personal or contextual. In addition to these micro-level factors, the influence of neighborhood context can't be ignored since people actively perceive and respond to their environments (Jessor et al. 1995). Scholars have found that the neighborhood quality plays an important role in affecting individuals' perceptions of opportunity, though they pay much more attention to perceptions of educational opportunity than perceptions of occupational opportunity.

Few studies have explored neighborhood effects on young people's occupational aspirations, and the results are mixed. Furlong, Biggart and Cartmel (1996) examine the local context in Scotland and argue that neighborhoods impact young men's occupational aspirations. Scottish male residents in very rural or highly urbanized areas have low occupational aspirations. In contrast, Wicht and Ludwig-Mayerhofer (2014) explore the relationship in Germany, and they find that the neighborhood influence on students' realistic occupational aspirations is really weak. The only significant influence appears among students from advantaged neighborhoods. Students receive more benefits from higher-class neighborhoods and Wicht and Ludwig-Mayerhofer (2014) argue that this is because students from these advantaged neighborhoods feel more social pressure and have higher socio-psychological costs (Besley and Coate 1992).

While there are a limited number of studies on the effects of neighborhoods on perceptions of occupational opportunity, there is extensive research of the effects of neighborhoods on children's perceptions of educational opportunity. Teachman and Paasch (1998) argue that neighborhood context provides children with social environments, and parents choose a neighborhood to provide their children with "physical resources and patterns of peer and adult relationships" (Brooks-Gunn et al. 1993; Crane 1991). Thus, children from a neighborhood which is socially organized well and with better educational sources tend to hold higher educational aspirations (Teachman and Paasch 1998). Ceballo, McLoyd and Toyokawa (2004) illustrate that the percentage of middle-class neighbors significantly predicts adolescents' educational values and affects their school efforts. Stewart, Stewart, and Simons (2007) also argue that African American adolescents have lower college aspirations if they reside in neighborhoods with structural disadvantages.

Several theories have provided explanations for the phenomena. Wilson's (1987; 1996) theory of neighborhood effects articulates that middle-class families serve as a role model and positively influence the collective socialization of adolescents in the neighborhood. Meanwhile, middle-class families also contribute financial and psychological benefits for improving the neighborhood quality (Wilson 1987). Comparatively, the contagion theory articulates that neighborhood effects influence behavioral outcomes through contagion process. In poor neighborhoods, social problems are epidemic and peer influence is the key of the process of spread (Crane 1991; Tienda 1991; Mayer and Jencks 1989).

The current literature about neighborhood effects on income and social mobility mainly emphasizes the role of social capital (Pinkster 2007; 2009). For example, economists have found that the duration of exposure to better neighborhood environments has positive influences on children's long-term outcomes, such as increasing college attendance and earnings and reducing single parenthood rates (Chetty, Hendren, and Katz 2016). However, to date, no research has assessed the effects of the physical environment of neighborhoods on the perceived opportunities for getting ahead in life for people (both adults and children). According to environmental psychology, the physical environment, including natural environment, social settings, and built environment, has large psychological impacts on people (e.g., MacKerron and Mourato 2013; Pasanen et al. 2018; Zelenski, Dopko, and Capaldi 2015; Gong et al. 2016; Young et al. 2018). Thus, the physical environment in a neighborhood, including road paving, house building, and parks, should stimulate people's cognitive reactions and emotions, and generate positive/negative attitudes towards their life and future. Current studies have shown that positive cognitions can make people feel more optimistic and more confident about their lives, then they are more inspired to achieve success in the future (Lupton and Kintrea 2011; Biggart and Furlong 1996;

Furlong, Biggart, and Cartmel 1996; Furlong and Biggart 1999). Thus, I argue that the positivity and optimism received from the physical environment of neighborhoods will make people perceive more opportunities for success through hard work.

2.2 Perceptions of (In)equality of Opportunity

Scholars have extensively studied the objective conceptualization of equality of opportunity. The concept and theory of equality of opportunity were proposed by John Roemer, an economist and political scientist. Developed from political philosophical thoughts, Roemer (1998) applies philosophical thoughts of equality of opportunity into applied economic and policy fields. His Equality of Opportunity theory is one of the theories of distributive justice. He argues (1998) that equal opportunity means that when individuals exert the same effort, they can obtain the same outcome. If there exists any inequality due to circumstances beyond individual control, then it is inequality of opportunity. Scholars have also examined objective equality and opportunity, and some scholars have developed new propositions, such as Brunori, Ferreira, and Peragine (2013), Pignataro (2012), Ramos and Van de Gaer (2012). Economists have explored the relationship between inequality, social mobility, equality of opportunity, and policy influences (Corak 2013; Piraino 2015; Nogales 2016; Lee and Seshadri 2018). They have also developed various measurements of Equality of Opportunity (e.g. Roemer 2002; Checchi and Peragine 2010) and objective social mobility (e.g. Solon 1992; Lee and Solon 2009; Björklund and Jäntti 1997). Roemer (2004) argues that in many countries, Equality of Opportunity was operationalized as intergenerational income mobility, but complete intergenerational mobility, which is normally reflected by "an intergenerational income transition" (Roemer 2004), is a necessary condition only for the most radical conception of equality of opportunity. The most radical conception of

equality of opportunity defined by Roemer (2004) is that policy makers should eliminate "the influence of not only social connections, family culture and investment, and the genetic transmission of ability, but also the influence of family background on the formation of preferences and aspiration"(Roemer 2004). Thus, he (Roemer 2004) contends that parental education is probably a strong substitute for income when studying the impact on children's preferences and aspiration.

Different from the concept of the objective equality of opportunity, subjective equality of opportunity is also important and deserves scholars' attention. Brunori (2017) finds that subjective perceptions of equality of opportunity are weakly correlated with objective measures of the degree of unequal opportunity in 23 European countries, which clearly demonstrates that subjective and objective equality of opportunity are two distinct concepts. He states that economic growth and individual experiences play determining roles in shaping people's subjective perceptions of equality of opportunity. McCall et al. (2017) show that rising income inequality leads to skepticism about the opportunity structure in society and increases supports for policies of redressing economic inequality. Lü (2011; 2013) focuses on the distribution of educational opportunities in China. Specifically, he investigates how the distributions of public goods and services affect an individual's perceptions of equality of opportunity, and examines the influences from the perceptions of equality of opportunity on people's resentment towards income inequality.

Though the literature about subjective equality of opportunity is not considered plentiful, some studies have probed into the factors which impact individuals' beliefs of meritocracy. Beliefs in equality of opportunity and beliefs in meritocracy are positively correlated concepts. According to the definition of the objective equality of opportunity, the inequality of outcome

coming from individual efforts is acceptable and should be taken as equal opportunity. Only the inequality of outcome due to circumstances beyond individuals' control is inequality of opportunity. Hence, if people believe that they are living in a meritocratic society, they will attribute inequality of outcome to individual efforts, and then they are more likely to perceive the opportunities are distributed equally. In the contrast, if people think that non-meritocratic elements weigh more in achieving success in the society, then they are liable to consider that the opportunities are not distributed equally. Prior literature has also demonstrated that when people do not believe in equality of opportunity, they will oppose meritocracy and competition and support more redistribution by governments (Jaime-Castillo and Marqués-Perales 2014).

Previous literature has researched factors which affect people's beliefs in meritocracy. Reynolds and Xian (2014) state that the young whites and upper-class whites are more likely to agree that the United States is a meritocratic society, while the old and lower-class racial minorities agree that non-meritocratic elements dominate. Furthermore, scholars have paid attention to local economic contexts but provided controversial findings. Consistent with the theory of activated class conflict, Newman, Johnston, and Lown (2015) demonstrate that residing in a high-inequality context generates a class-based polarization of beliefs in meritocracy. When living in more unequal counties, low-income residents lean to an avoidance of meritocracy while high-income residents choose to advocate for meritocracy, in contrast, in less unequal context, both rich and poor people believe in meritocracy. Different from Newman, Johnston, and Lown (2015), Solt et al.'s (2016) research finds support for a theory of relative power, where larger income inequality in local contexts vested rich people more power to spread their views of meritocracy in the public sphere and then to form a widespread belief in meritocracy for both rich and poor people. Moreover, Newman (2016) ties gender, local income inequality and beliefs

about meritocracy together and argues that women are more likely to reject the meritocratic ideology when local women's earnings fall just closely behind men.

Though previous literature has identified causal factors of perceptions of equality of opportunity, they focus on the factors from the macro- or micro-level. Scholars have noticed that local contexts influence people's perceptions of inequality of opportunity, but no research has taken the meso-level characters, such as daily living environments, into consideration. This research is going to fill this gap. I will develop my theoretical framework, the Opportunity Beliefs Theory, and focus on exploring the causes of the perceptions of equality of opportunity in the United States from the perspective of social psychology. Specifically, the residential neighborhood is important in people's daily life but is overlooked in studies about perceptions of inequality of opportunity, I will examine the impacts from neighborhood environments on people's perceptions of equality of opportunity.

CHAPTER 3 OPPORTUNITY BELIEFS THEORY

Inspired by the research from psychology and development economics, I developed the Opportunity Beliefs Theory to explain how the built environment in neighborhoods affects individuals' opportunity beliefs. The theory aims to elucidate how environmental factors psychologically affect people's beliefs and behavior. People's level of motivation, affective states, and actions are based more on what they believe than on the objective reality (Bandura 1995, 2). Similarly with social identity theory, which argues that people classify themselves into certain groups depending on cognitive and emotional process consciously or unconsciously (Burke and Stets 2009), people also rate and classify their capabilities based on the cognitive and emotional process. Specifically, the daily-exposed environment plays a critical role in the process by presenting people with the visible cues and symbols and stimulate their positive/negative emotions with or without their consciousness. The cognitive and emotional information received from the physical environment is the main source for people to generate their opinions about their own capabilities and competence, which is known as perceived self-efficacy, automatically. When people are more confident in their competence (highly self-efficacious), they should more actively pursue future success. Previous literature contributes to different stages of the theory, but no theory has linked the physical environment and the opportunity beliefs together. The Opportunity Beliefs Theory integrates self-efficacy theory with theories in positive psychology and environmental psychology, and provides an overarching picture to clarify the relationship between the physical environment and human perceptions.

Predominantly, the Opportunity Beliefs Theory argues that the physical environment in a neighborhood can influence residents' opportunity beliefs through affecting people's emotions and their self-evaluation. People who reside in neighborhoods with well-maintained (badly-

maintained) built environment will receive positive (negative) signals from their environments, then generate positive (negative) emotions and a higher-level (low-level) self-efficacy. Next, the positivity (negativity) will help these residents perceive more (less) opportunities and more (less) equal distributions of opportunities in the society.

3.1 Physical Environment and Self-efficacy

Neighborhood condition is a collective good and affects the well-being of all residents (Leonard 2016). Its maintenance is provided by all neighborhood residents, with the intervention of neighborhood-representing community associations. With the knowledge of local contexts, neighborhood associations contribute to multiple aspects of neighborhood developments, including the maintenance and improvement of neighborhood physical and social environments (Hur and Bollinger 2015). Additionally, local governments play an important role in neighborhood developments, either through established formal citizen-participation mechanisms, or specific neighborhood-based organizations or associations (Chaskin and Abunimah 1999). Specifically, “policing, prosecution, incarceration, and zoning” (Chaskin and Abunimah 1999) are inalienable responsibilities of governments for serving neighborhoods. In addition, for large capital projects related to social planning and economic development in the neighborhoods but beyond the capacities of neighborhood-based organizations, local governments should engage in delivery of those services and provision of assistances (Chaskin and Abunimah 1999). Therefore, maintaining and improving neighborhood condition is not only an individual business, but also a shared responsibility among individual residents, neighborhood-based governance entities, and local governments.

Psychologists have identified the linkage between neighborhood conditions, emotions and self-efficacy, but many prior studies focus solely on the social contexts of the neighborhoods. For instance, Dupéré, Leventhal, and Vitaro (2012) demonstrate that adolescents living in violent neighborhoods hold low-levels of self-efficacy and feel powerless in their ability to succeed in the future. Boardman and Robert (2000) explore the role of neighborhood socioeconomic status on the formation of one's self-efficacy. They argue that individuals living in a neighborhood with high proportions of unemployment and public assistance report lower levels of self-efficacy. Neighborhood socioeconomic status may even play a larger role in affecting individuals' self-efficacy than individual-level socioeconomic status features. In this research, I argue that the physical environment in a neighborhood also plays a role in forming one's self-efficacy.

Self-efficacy theory explains how the cognitive process mediates behavioral changes. Bandura (1977) differentiated two concepts of outcome expectancies and efficacy expectancies. An outcome expectancy is defined as people's estimation of certain outcomes from a given behavior, while an efficacy expectation is "the conviction that one can successfully execute the behavior required to produce the outcomes" (Bandura 1977, 193). Efficacy expectations decide the efforts people will spend and their persistence when they face difficulties (Bandura 1977). Positive psychologists have demonstrated that self-efficacy is about positive expectancies about the future, it has positive relationship with workplace performance (Avey, Luthans, and Youssef 2010). Individuals with an internal locus of control and a high-level of self-efficacy are more likely to believe their competence, and they are more likely to agree that success can be achieved with significant personal effort (e.g., Rotter 1954; Bandura 1977; Luthans et al. 2007; Avey, Luthans, and Youssef 2010). Development economists have also already brought these ideas to

solve the problem of poverty. They argued that an individual's efforts could be hampered by internal constraints (limited aspirations) before external constraints (Ray 2006). Hence, it was critical to identify the psychological and structural factors of poverty traps (Lybbert and Wydick 2019).

People's beliefs of self-efficacy can be developed through four main sources, mastery experiences (experiences of successes and failures), vicarious experiences from social models, social persuasion, and physiological and emotional states in judging their capabilities (Bandura 1995). The physical environment can affect residents' self-efficacy though multiple paths. First, usually individuals' residential choices reflect their wealth. Over recent decades, metropolitan areas in United States have experienced an extensive rise in neighborhood-level sorting by income (Jargowsky 1996; Watson 2009). People with higher income commonly live in better-maintained neighborhoods with access to more public services, such as education, garbage collection, and police protection (Conley and Dix 2004). Those affluent neighborhoods can be taken as "model neighborhoods." People who can't afford to live in these neighborhoods may identify their social status based on the comparison between these "model neighborhoods" and their own neighborhoods. People can also learn from other people who live in or move into these "model neighborhoods" then evaluate themselves. Through the vicarious learning experience, people live in better-maintained neighborhoods may generate higher self-efficacy while residents in badly-maintained neighborhoods hold lower self-efficacy. Second, verbal persuasion from others, like neighbors, friends, and media, may reinforce the stereotype of segregation of neighborhoods by income. Poor neighborhoods are often linked with deficient educational resources and lacking job opportunities (Warren 2005; Wilson 1996). Hence, the verbal persuasion can lower self-efficacy for people living in impoverished neighborhoods. Last but not

least, in this research, I will specifically focus on the fourth main source of self-efficacy, which is individuals' physiological and emotional states in judging their capabilities. Numerous literature has probed into the role of emotion in cognition and behavior, but there is not an agreed upon definition of emotion in the literature. Generally, emotion is a mental experience (Cabanac 2002). According to psychological constructionists, an emotional state is a function of "a state of physiological arousal and of a cognition appropriate to this state of arousal" (Schachter and Singer 1962). Cognitions arising from the immediate situation are interpreted in light of past experience, and this interpretation generates psychological arousal, such as joy, anger, or other feelings (Schachter and Singer 1962). I argue that residents perceive the visible cues from the physical environment of their neighborhoods, then they interpret these cues and generate an emotional response. These psychological and emotional arousals are important sources for the formation of the residents' self-efficacy.

Scholars from sociology, psychology, and criminology have demonstrated that the living environment can arouse negative emotions. Previous literature has uncovered that disadvantaged neighborhood overall appearance, including rundown buildings, vandalism, graffiti, trash, dirt and noise, increases bad emotions, such as depression, anxiety, stress, and fear, and is deleterious to both physical and mental health (e.g., Geis and Ross 1998; Kim 2010; Botchkovar, Antonaccio, and Hughes 2018; Kim 2010; Hill, Ross, and Angel 2005; Latkin and Curry 2003; O'Brien, Farrell, and Welsh 2019; Burdette and Hill 2008). Prior research has also revealed that the neighborhood disorder, social and physical, affects people's perceived powerlessness, normlessness, mistrust, and isolation, and these perceptions in turn lead to anxiety, angry agitation, and depression (Geis and Ross 1998; Ross and Mirowsky 2009). Therefore, I posit that badly-maintained neighborhoods will transfer more negative emotion messages to their residents,

and then if residents experience more aversive arousal, they are going to have lower level self-efficacy. The previous literature just mainly pays attention to destructive impacts of negative emotional messages from neighborhoods, but ignores the role of positive emotions from neighborhoods. My research will fill this gap by empirically testing that the built environment of neighborhoods can also stimulate residents' positive emotions, and furthermore, the positive emotions will boost residents' self-efficacy.

Emotional states have widespread influence on determining self-efficacy judgments. Though emotions are different from goals, they arise from the pre-setting goals. According to Lazarus (1999), negatively toned emotions derive from "delay or thwarting goals". In contrast, positively-toned emotions generate from situations which can "facilitate goals". Self-efficacy is about the confidence of ability to realize goals. Therefore, positive emotions should enhance people's perceived self-efficacy while negative emotional moods decrease it (Kavanagh and Bower 1985). Prior literature about how psychological and emotional arousal affects self-efficacy has suggested that negative emotions can impair personal performance and undermine self-efficacy (Bandura 1977a; Usher and Pajares 2008). Bandura (1977a) claims that high psychological arousal will influence people's judgements of their anxiety and vulnerability to stress so that people are less likely to expect success when they are beset by aversive arousal. Correspondingly, positive emotions should have constructive impacts on self-efficacy but this field is understudied. Fredrickson (2001) asserts that positive emotions function as internal signals to approach or continue, which will promote individuals activity engagement. Lazarus (1999) takes hope as an emotion and states that hope "requires the belief in the possibility of a favorable outcome". He argues that hope combines longing for a better outcome and the belief in our actions to achieve the desired outcome. The belief in our actions can be taken as self-

confidence, or self-efficacy. However, he does not concur that hope depends on self-efficacy (Bandura 1997) and supposes this idea is an overstatement. I agree with Lazarus (1999), and in addition, I think that hope can also promote self-efficacy considering that people who are hopeful have an optimistic state of mind and look forward to positive outcomes.

Conclusively, the built environment of neighborhood can affect self-efficacy through emotions. Residents generate positive/negative emotions based on visible signals which they receive from the physical environment. Positive emotions will nurture individuals' self-efficacy, while negative emotions will harm self-efficacy.

3.2 Self-Efficacy and Opportunity Beliefs

The concept of self-efficacy is about competence and control, and it is also congruent with the values of mastery and achievement (Gecas 1989). Perceived self-efficacy is the belief "in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura 1997, 3). Because of its essence, I argue that self-efficacy inherently affects individuals' perceptions of opportunity and perceptions of inequality of opportunity.

3.2.1 Self-Efficacy and Perceptions of Opportunity

As one of the vital self-evaluative traits, empirical studies have found the self-efficacy has positive impacts on people's achievement-related behaviors, including both educational and occupational success (Burger, Mortimer, and Johnson 2020; Grabowski, Call, and Mortimer 2001; Betz and Hackett 1981; Brown, Lent, and Larkin 1989; Lent, Brown, and Larkin 1984, 1986; 1987; Siegel, Galassi, and Ware 1985). Prior literature has investigated the relationship between the self-efficacy and both subjective career-related expectations/aspirations and

educational outcome expectations (Ali, McWhirter, and Chronister 2005; Tang, Fouad, and Smith 1999; Hackett and Betz 1981; Betz and Hackett 1981; Liu et al. 2020; Zysberg and Schwabsky 2020; Lent and Brown 2019; Lent et al. 2018). Overall, people who hold a high-level of general/specific-domain self-efficacy are more likely to have high educational/occupational expectations. Moreover, according to positive psychology, there is a positive relationship between self-efficacy and work performance and satisfaction (Luthans et al. 2007; Avey, Luthans, and Youssef 2010). When people have a high level of self-efficacy, they are more confident about their abilities for achieving success (Rotter 1954; Bandura 1977; Luthans et al. 2007; Avey, Luthans, and Youssef 2010). Therefore, I argue that individuals with a high-level of self-efficacy will be more assured about accomplishing their goals in the future and perceive more opportunities for getting ahead in their lives. Specifically in this research, I refer more opportunities for getting ahead in life to higher income, higher social status, and more education.

3.2.2 Self-Efficacy and Perceptions of (In)equality of Opportunity

Next, regarding perceptions of inequality of opportunity, it is a different concept from the perceptions of opportunity. The latter one is an estimation of resources owned by the individual and the expectation of achievement in the future. Briefly speaking, it is like an mathematical calculation. Different from the perceptions of opportunity, the concept of the perceptions of inequality of opportunity considers whether the resources for getting ahead in life are distributed equally for everyone in the society. It is closely associated with other notions, such as meritocracy, fairness, and legitimation.

Scholars have noticed and explored the impacts of self-efficacy on concepts which are relative to the perceptions of inequality of opportunity, but the results are ambivalent. In

Gecas'(1989) comprehensive review of self-efficacy in social psychology, he states that though the effect of self on society is really important, it is the most challenging and overlooked connection in social psychology. He (Gecas 1989) points out that the concept of self-efficacy may help advance the connection. For instance, Della Fave (1980; 1986a, 1986b) proposes his self-evaluation theory to explain how legitimating norms for the stratification of a society are developed via the formation of the self. First, through a process of comparison with others, individuals realize if the primary resources are distributed just for themselves and develop their self-evaluations. People with high self-evaluations will think they are deserving of high-levels of resources compared to others. Next, individuals will make their judgements about whether the stratification of a society is legitimate. The degree of legitimacy corresponds to "the degree of congruence between the distribution of primary resources and the distribution of self-evaluations" (Della Fave 1980). Della Fave (1986b) defines self-evaluation as a perceived control and states that "self-evaluation is specific to a person's definition of his or her ability to control the larger social environment" and this kind of control are made possible by wealth and power. Thus, though Della Fave (1980) claims that his self-evaluation is not self-efficacy, his self-evaluation is actually very much like the concept of self-efficacy (Gecas 1989).

Other scholars have empirically tested the self-evaluation theory proposed by Della Fave (1980), but the results are mixed and are not always encouraging. Stotle (1983) reformulates Della Fave's self-evaluation theory. He manifests "structural inequality" with an exchange network of resources to represent the position, power, and stratification. Then, he refines "self-evaluation" specifically as self-efficacy and tests the propositions put forward by Della Fave (1980) with an experiment. According to Stotle (1983), the results do not support the reformulated self-evaluation theory. Though positional power significantly affects self-efficacy

perceptions, it also has a significant effect on individuals' perceptions of fairness. Thus, the results violate one of the propositions from self-evaluation theory which is that people's perceptions of fairness will not vary with their relative positional power. However, Stotle (1983) takes both self-efficacy and perceptions of fairness as dependent variables and does not test the relationship between them, thus, we can't conclude that whether self-efficacy, *per se*, has an impact on perceptions of fairness.

Shepelak (1987) also empirically tests self-evaluation theory with survey data. The results suggest that self-evaluations only generate modest and conditional effects on perceptions of equity. Family income has a stronger connection with perceptions of fairness. Yet, Shepelak (1987) makes use of a general self-esteem index to measure self-evaluation which may be the reason for the insignificant results. First, Della Fave (1986a) declares that his self-evaluation is not equal to self-esteem and there should be only a weak correlation between positions in the stratification system and global self-esteem. The concept of self-evaluation needs to focus on people's conceptions of themselves and their capabilities related to wealth and power. Second, although self-esteem is highly correlated with self-efficacy, they are conceptually and empirically distinct from each other. According to Chen, Gully and Eden (2004), self-efficacy and self-esteem are constructs of self-evaluations. Self-efficacy, measured as either general self-efficacy or task-specific self-efficacy, is an indicator of trait-like and state-like, while self-esteem is a trait-like and state-like affective variable (Chen, Gully and Eden 2004). In other words, self-efficacy reflects abilities, skills, goals, competence, and achievements. In contrast, self-esteem measures emotions and moods. When people face challenges in their lives, emotions and moods can promote or impair the situation, but they ultimately need to rely on their abilities and competence to overcome difficulties and achieve success. When they are confident with their

abilities, they should be more likely to attribute rewards/failure internally, and be more likely to perceive fairness in the society. Therefore, I argue that self-efficacy, more so than self-esteem, plays an important role in affecting individuals' perceptions of fairness, which in this research, is the perceptions of inequality of opportunity.

Built on previous studies, Sutphin and Simpson (2009) conduct experimental studies and, to my knowledge, provide the first study that supports all stages of self-evaluation theory. In this study, Sutphin and Simpson (2009) employ three questions to measure participants' self-evaluation: (1) participants' rating of their success at gaining profit points, (2) participants' perceived ability to attain points based on their positions, and (3) participants' confidence about their ability to gain points. Their measurement of self-evaluation is more consistent with self-efficacy. They (Sutphin and Simpson 2009) found that self-evaluations vary by individuals' positions in power structures, and also partially predict perceptions of fairness and perceptions of legitimacy. Participants in disadvantaged positions with low self-evaluations have higher perceptions of fairness than people in the same position with high self-evaluations. The impact of self-evaluation on perceived fairness is not significant for people in advantaged positions. Participants in advantaged positions with high self-evaluations perceive more legitimacy of the structure than people in the same position with low self-evaluations. The effect of self-evaluation on perceptions of legitimacy does not exist among people in disadvantaged positions.

The mixed results of self-evaluation theory highlight the importance of exploring the relationship between self-efficacy and opportunity beliefs. Arguably, people from the same social class (the same social position in self-evaluation theory) but with higher self-efficacy should expect more success for themselves. They will perceive more opportunities for reaching their goals. However, for perceptions of the distributions of opportunities in society, my

inference is not consistent with self-evaluation theory. Self-evaluation argues that people in disadvantage positions with low self-evaluations and people in advantage positions with high self-evaluations should perceive more fairness and be more likely to legitimize the distribution system, compared to people in disadvantage positions with high self-evaluations and people in advantage positions with high self-evaluations respectively. I argue that self-efficacy makes people believe in their abilities and increases their resilience when they meet challenges or difficulties. Therefore, people with high-level of self-efficacy will mainly ascribe success or failure internally and not complain the societal unfairness, and then they will perceive more equally distributed opportunities in society. I will use a more detailed scale to measure self-efficacy and see whether the empirical results are consistent with my argument. In addition, in both experimental studies in Sutphin and Simpson (2009), participants are in the same-gender groups so that it is not able to compare the impact of self-evaluation across different genders. However, gender indeed plays a role in the formation of self-efficacy (Hackett and Betz 1981; Betz and Hackett 1981). In my research, I will fill this gap and study if there are significant differences existing between self-efficacy and perceptions of inequality of opportunity because of gender.

3.3 Hypotheses

I argue that physical environmental elements can play a significant role in affecting people's perceptions of themselves and the society. Individuals perceive positive or negative visible messages from physical environments. When individuals sense more positive emotions, they are more likely to have a higher evaluation of their self-efficacy and be more confident about their ability and future. Moreover, they are more likely to justify the current distribution system of

opportunities in the society and favor equality of opportunity. Therefore, controlling for people's social class, residents living in neighborhoods with well-maintained built environments will perceive more opportunities ahead to succeed and perceive more equal opportunities in the society, compared to people living in neighborhoods with badly-maintained built environments. The impacts through self-efficacy may be reinforced in a society like the U.S. According to the Ideology thesis, individuals' beliefs are influenced by dominant values (Kluegel and Smith 1986). Kluegel and Smith (1986) assume that there exists a relatively stable dominant stratification ideology in the U.S. Individual attributes are the key for people's social status. Overall, the unequal distribution of economic rewards is fair. In this case, people focus more on improving their own abilities for achieving success in the future. Hence, when individuals' self-efficacy is elevated, they are more likely to perceive more opportunities and believe that opportunities are distributed equally in the whole society. Additionally, since wealthy neighborhoods are usually well maintained, and affluent people have higher levels of mobility and more access to opportunities because of their family background, the physical environment of neighborhood may have limited impact on higher-income people. Therefore, this dissertation will focus on middle-class or low-income individuals and explore how the built-environment of their neighborhoods affects their opportunity beliefs.

Figure 3.1 displays the focal relationship between the built environment in neighborhoods and opportunity beliefs. According to the Opportunity Beliefs Theory, I put forward two hypotheses:

Hypothesis 1 Controlling for people's socioeconomic status, people who live in a neighborhood with a better-maintained built environment will perceive more opportunities for getting ahead in life.

Hypothesis 2 Controlling for people's socioeconomic status, people who live in a neighborhood with a better-maintained built environment will perceive more equal distribution of opportunities in the society.

Regarding the primary mediator, self-efficacy, between the built environment in neighborhoods and opportunity beliefs, I propose three hypothesis:

Hypothesis 3 Controlling for people's socioeconomic status, people who live in a neighborhood with a better-maintained built environment will have a higher-level of self-efficacy.

Hypothesis 4 Controlling for people's socioeconomic status, people who have a higher-level of self-efficacy will perceive more opportunities for getting ahead in life.

Hypothesis 5 Controlling for people's socioeconomic status, People who have a higher-level of self-efficacy will perceive more equal distribution of opportunities in the society.

In addition, since I argue that emotions are the main source for self-efficacy in this case, I will also test the hypothesis to see whether residents' emotions are affected by physical environment in neighborhood:

Hypothesis 6 Controlling for people's socioeconomic status, people who live in a neighborhood with a better-maintained built environment will generate more positive emotions.

Hypothesis 7 Controlling for people's socioeconomic status, people who hold more positive emotions will have a higher-level of self-efficacy.

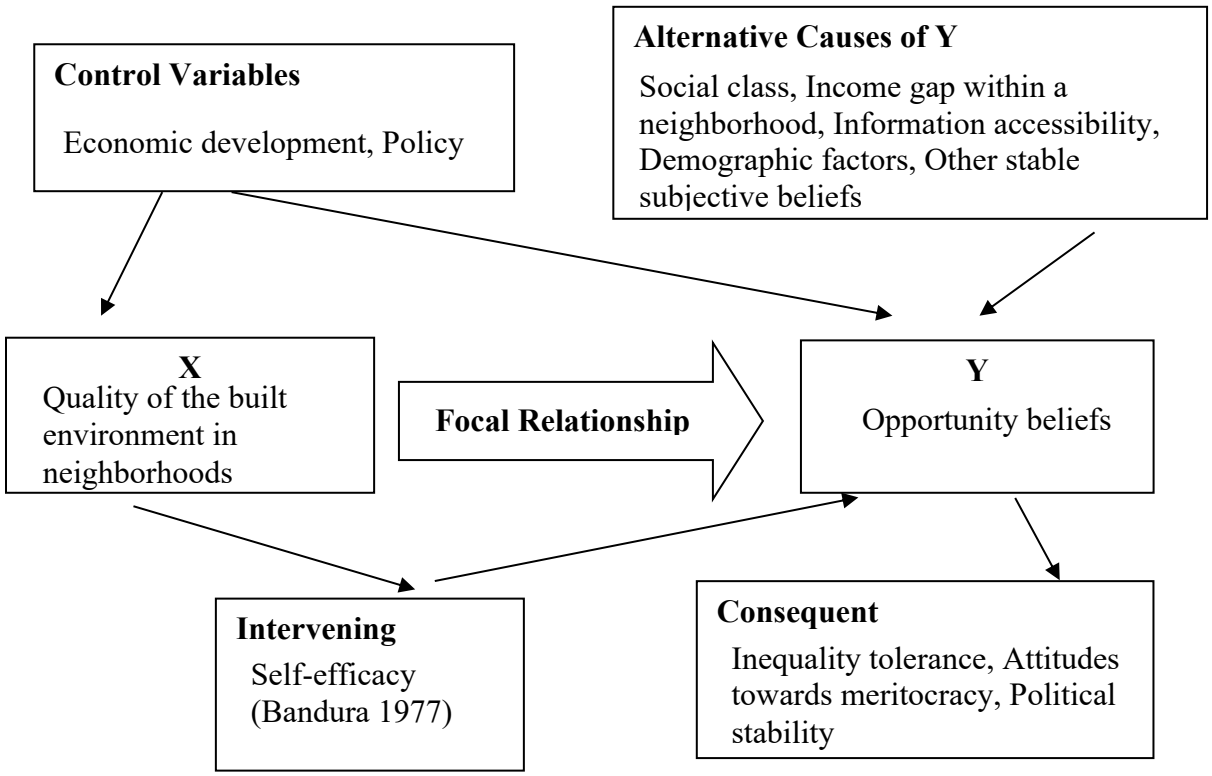

Figure 3.1 Theoretical Framework for Neighborhoods Effects on Opportunity Beliefs

CHAPTER 4 RESEARCH DESIGN

I have collected original data to test the hypotheses. Two types of quantitative methods, cross-sectional survey and experimental survey, are incorporated in this research to seek general description and test causal hypotheses (King, Keohane, and Verba 1994, 3). The focal dependent variable in this research is opportunity beliefs. The focal independent variable is the built environment of neighborhoods. I have designed three studies which can support each other to explore the valid causal inferences between my focal dependent variable and independent variable. First, In order to understand how the built environment in neighborhoods affects Americans' opportunity beliefs, I designed a conventional survey which has been given to Internet-users across the United States. Though it is not a census survey, it can obtain samples nation-wide and has high external validity.

Next, since the observational study can only test the correlation but not causation between the built environment in neighborhoods and opportunity beliefs, I conducted two-round survey experiments to maximize the causal inference. The major comparative advantages of experiments are they have high degree of internal validity. With experiments, researchers can make use of experimental control and precise measurement to derive causal inferences and explore the details of the process (McDermott 2002). The two survey experiments are conducted on Amazon's Mechanical Turk (MTurk). MTurk is one of the essential research tools in the past decade, which helps researchers collect large amounts of data rapidly at a relatively inexpensive rate (Chmielewski and Kucker 2020, Buhrmester, Talaifar, and Gosling 2018). Though the sample of MTurk study is not randomly selected and may be questioned of its low external validity, I use MTurk study to increase confidence in internal validity of my research. The random assignment to the treatment and control groups ensures a high-level of internal validity.

With the two-rounded online survey experiments, I can test the causality and explore the causal mechanism between the built environment in neighborhoods and opportunity beliefs. I can also find the mediators between the focal dependent variable and independent variable. All survey and survey experiments are online studies. Internet surveys had a sizeable coverage bias when Internet access had more limitations than today, but the problem is not a concern now considering more people have access to the Internet (Weisberg 2018). With the three data sources and analyses, this research provides a comprehensive explanation of how the built environment in neighborhoods affects the Americans' opportunity beliefs. All of the surveys and survey experiments have obtained the university's institutional review board (IRB) approval.

4.1. Observational Study

To test the first two hypotheses, first, I collected my original data from the Cooperative Congressional Election Study (CCES) in 2018. The 2018 CCES had a nation-wide sample stratified by state and type of district. It was administered by YouGov on the Internet and involved 60 teams. Each research team recruited 1,000 respondents. The YouGov's matched random sample methodology and weights were employed to ensure that the sample of the 2018 CCES was representative of adult Americans (Schaffner, Ansolabehere, and Luks 2019). My survey was incorporated in the team module from the University of North Carolina at Charlotte (UNC Charlotte) (Maestas 2018). The UNC Charlotte Team Module was supported by funding and research assistance through the Marshall A. Rauch Endowment, Metropolitan Studies, Public Opinion, Learning, and Sentiment Lab (POLS-Lab), and the Public Policy Program at UNC Charlotte.

4.1.1 Dependent Variables

To examine people's opportunity beliefs, two focal dependent variables, the perceptions of opportunity and the perceptions of equality of opportunity are included in the research. In the survey, two questions were designed to measure the opportunity beliefs:

(1) As for the perceptions of opportunities, if someone is highly self-efficacious, he/she should hold more positive attitudes when evaluating the opportunities for the next generation. Thus, I asked the respondents whether they agreed that children today had more opportunities for getting ahead in life compared to children from their own generation.

(2) For the perceptions of equality of opportunity, the respondents were asked that whether they agree/disagree that in the United States, everyone has the equal opportunities for getting ahead in life, compared to people from other income levels. Respondents were randomly assigned to two groups regarding two different narratives of the question. One group stated that "there is no difference in opportunities for me compared to people who are richer than me," while the other group phrased that "there is no difference in opportunities for me compared to people who are poorer than me." A treatment variable was generated based on the two versions of question, and the treatment variable is included as one of the control variables in the model when the dependent variable is the perceptions of equality of opportunity.

Both the focal dependent variables are ordinal variables with four-point Likert scale. The values are strongly agree, somewhat agree, somewhat disagree, and strongly disagree. The neutral value (neither agree nor disagree) was not provided in the national survey in order to force the respondents to give their choice towards their opportunity beliefs. The dependent variables being designed with 4-point Likert scale questions is because the survey is just a part of a large survey with other projects. Because the limitation of cost and time confine the length of

the survey, only the two questions are used to measure the dependent variables. In the online survey experiments, I have put forward more detailed questions to measure the respondents' opportunity beliefs.

4.1.2 Independent Variables

In my survey which is incorporated in the 2018 CCES, the respondents were asked to evaluate the built environment of their neighborhood from two aspects, including the conditions of buildings and the maintenance of roads and sidewalks. First, I asked whether they thought that many buildings in their neighborhoods need to be repaired or fixed up. Second, the respondents needed to answer that if the roads and sidewalks in their neighborhoods were well-maintained. I use the respondents' subjective evaluations of their neighborhood environments because studies have demonstrated people's subjective perceptions and assessments of their environmental conditions have crucial mental and behavioral outcomes (Shumow, Vandell, and Posner 1998).

Like the dependent variables, the questions for the independent variables were also designed as 4-point Likert scale, strongly agree, somewhat agree, somewhat disagree, or strongly disagree, because of the space limitation. Again, the respondents were forced to give their choice towards the built environment of neighborhoods.

4.1.3 Control Variables

Based on the literature review in Chapter 2, a number of personal and contextual factors affect individuals' opportunity beliefs. Therefore, I identified confounding variables from Common Content of 2018 CCES (Schaffner, Ansolabehere, and Luks 2019) and my own survey to rule out the spurious association. For the 2018 CCES, half of the questionnaire was designed by each

research team, while the other half is dedicated to Common Content. The Common Content includes the respondents' demographic and socio-economic characteristics, such as age, gender, race/ethnicity, marital status, whether they having children, employment status, political ideology, the change of household income, education, and home ownership. In addition, since political ideology, perceived income inequality, and opportunity beliefs are correlated with each other (Newman, Johnston, and Lown 2015; Ladewig 2021; Muraoka and Rosas 2021; Newman 2016; Solt et al. 2016; Mitchell et al. 2003; Christiansen and Lavine 1997; Laméris, Garretsen, and Jong-A-Pin 2020; Alesina, Stantcheva, and Teso 2018; Buscha 2012), political ideology is included as a control variable in the model. Whether people live in urban, suburban, or rural areas may also affect people's opportunity beliefs because of the large differences among urban, suburban and rural areas regarding demographics, politics, economic development, etc. (Parker et al. 2018) Thus, the geographical information of urban/suburban/rural area is included as a control variable.

I also control for subjective opinions that may affect people's opportunity beliefs. First, the respondents were asked to indicate their opinions on income inequality in the United States. According to previous literature, opinions on income gap have large effects on people's opportunity beliefs (McCall et al. 2017). Next, the beliefs about the sources of economic success and failure is politically important because they strongly impact the perceived economic fairness and public opinion on social welfare policies (Bénabou and Tirole 2006; Alesina and Ferrara 2005). Also, previous literature has found that the beliefs in meritocracy is highly correlated with the perceptions of equality of opportunity. When people perceive that the opportunities are not distributed equally on the society, they are more likely to oppose meritocracy and competition and require greater government responsibility (Jaime-Castillo and Marqués-Perales 2014).

Reversely, if an individual believes in meritocracy, he/she may perceive that the opportunities are distributed equally in our society. Thus, people's beliefs about the sources of economic success and failure should also affect their opportunity beliefs and were included as a control variable. Therefore, in my survey, I included the question about the source of success, "In the U.S., having ambition and working hard is more important for getting ahead in life than coming from a wealthy family."

Furthermore, at the neighborhood level, other than the built environment, other visible demographic and socio-economic neighborhood characteristics may affect residents' opportunity beliefs. Since the racial composition of neighborhoods affects children's educational decisions (Duncan 1994), residents' evaluation of the racial mixture/separation in the neighborhood is incorporated in the model as a control variable. Additionally, scholars have found that daily exposure to inequality affects people's attitudes towards wealth inequality and redistributive policies (Sands and Kadt 2020; Sands 2017). Prior literature has shown that the socio-economic condition of a neighborhood can affect residents' subjective opinions related to upward mobility (Ceballo, McLoyd and Toyokawa 2004; Brooks-Gunn et al. 1993). Thus, respondents' assessments of the economic status of other residents is included as a control variable in the model. In my survey, I add the question asking respondents that "my neighborhood has a mix of people with different racial and ethnic backgrounds." The presence of new development in the neighborhoods, such as new homes or businesses, can also reflect the socio-economic condition of a neighborhood. Thus, this factor is also included as one of the control variables in the model. These last two socio-economic items also suggest whether the neighborhood is undergoing a gentrification.

4.1.4 Data and Methods

The sample of the 2018 CCES survey has 1,000 respondents originally. 39 missing data was excluded from the dataset. 92 respondents who were not sure about their political ideology were not included in the dataset, either. In addition, the data only include individuals who are middle-class or have low income based on individuals' family income. The 2018 CCES incorporates the question about respondents' family income. According to a recent Pew Research Center report (Horowitz, Igielnik, and Kochhar 2020), a family of three with income less than $40,100 in 2018 dollars is categorized as low-income group. A family of three with income between $40,100 to $120,400 in 2018 dollars is assigned to the middle-income group. A family of three with income more than $120,400 in 2018 dollars belongs to the upper-income group. Usually, the affluent neighborhoods do not have the built-environment maintenance issues. Therefore, the final dataset with 678 observations only includes respondents whose family income is less than $120,000.

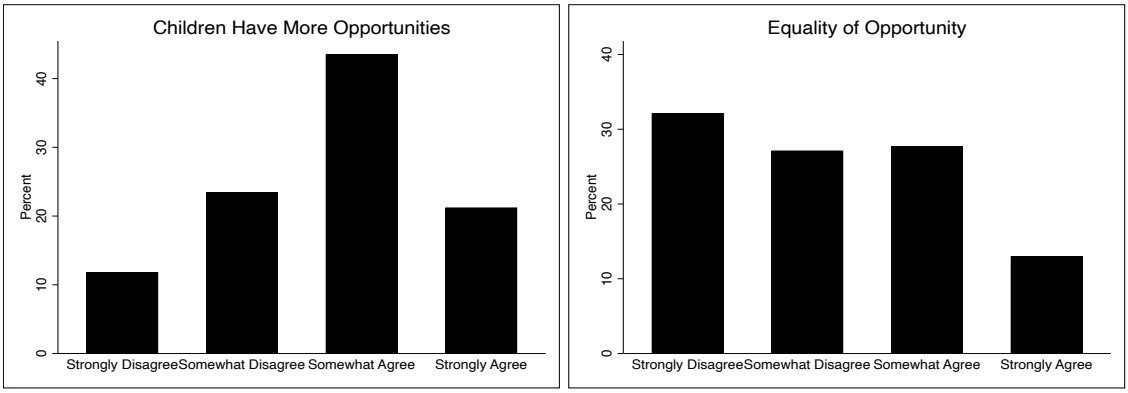

Figure 4.1 Weighted Frequency Distributions for Opportunity Beliefs in the CCES National Survey (n = 678)

Figure 4.1 reflects the distribution of its frequencies of the two dependent variables of opportunity beliefs. Because both of the dependent variables are ordinal variables, first I ran

Brant Test to see if ordered logistic regression can be adopted here to do data analysis. Brant Test was conducted and the proportional odds assumption has been violated for both models when running the ordinal logistic regression. For the model with the dependent variable as "Children Have More Opportunities," the results of Brant test of parallel regression assumption is: $\chi^2 = 70.08$, $df = 52$, $p = .048$. For the model with the dependent variable as "Equal Opportunity," the results of Brant test of parallel regression assumption is: $\chi^2 = 101.59$, $df = 54$, $p = .000$. Hence, the ordinal logistic regression cannot be applied here for analyzing data. Next, I tested the partial proportional odds ordered logit model to analyze the correlation between the focal dependent and independent variables.

A partial proportional odds ordered logit model will only free the proportional odds constraint for the variables where it is not justified, so it is less restrictive than the ordered logit model and at the same time, more parsimonious than the proportional odds models fitted by a nonordinal method, such as multinomial logistic regression (Williams 2006; 2016). I ran the partial proportional odds ordered logit model in Stata/IC 15.0. Though there is little theory as to which variables violate the proportional odds assumption, Stata can easily identify which variables do not meet the proportional odds assumption and free the constraints for those variables with commands of gologit2 and autofit. First a series of Wald tests are conducted on each variable to detect whether a variable meets the proportional odds assumption. If there is statistically insignificant result for one or more variables according the results from Wald tests, "the variable with the least significant value on the Wald test is constrained to have equal effects across equations" (Williams 2006). Then the model is refitted with constraints and the whole process will be repeated until no more variables meets the proportional odds assumption. At last, a global

Wald test will be conducted to check whether the final model meet the proportional odds assumption.

$$P(Y_i > j) = \frac{\exp(\alpha_j X1_i\beta1 + X2_i\beta2_j)}{1 + \{exp(\alpha_j + X1_i\beta1 + X2_i\beta2_j)\}}, j = 1, 2, \ldots, M - 1$$

Above is the equation for the partial proportional odds ordered logit model. The β's for *X1* are kept the same for all values of *j* while the β's for *X2* do not have the constraint and are free to be different (William 2006).

Because there is little theory as to which variables violate the proportional odds assumption, I also raised the standard and specified a more stringent significant level (.01) when testing violations of assumptions with a series of Wald tests (William 2006). For the equation with the dependent variable of whether children having more opportunities, the results for the global Wald test is: $\chi^2 = 61.82$, $df = 50$, $p = .1220$. An insignificant test statistic indicates that the final model meets the proportional odds assumption. For the equation with the dependent variable of perceptions on equal opportunities, the results for the global Wald test is: $\chi^2 = 54.47$, $df = 48$, $p = .2420$. Again, the final model does not violate the proportional odds assumption. Therefore, the partial proportional odds ordered logit model has been employed to analyze the 2018 CCES survey data.

4.1.5 Limitations

The CCES survey is an Internet-based national stratified sample survey. Though it is not census, the YouGov's matched random sample methodology makes sure the survey can reflect the opportunity beliefs across the population in the United States. According to Schaffner, Ansolabehere, and Luks (2019), the matched random sample methodology includes two stages.

First, a true probability target sample was drawn from the target population, with the sampling frame of U.S. citizens from the 2017 American Community Survey (ACS). Next, the matched sample for the CCES was drawn from the YouGov Panel and the Dynata, Critical Mix, and Prodege panels, and the respondents in the CCES sample were matched to the target sample with the proximity matching method. Because the matched sample is similar to the target sample, it is representative of the target population. Therefore, the high level of external validity is the biggest advantage of this survey.

However, the CCES survey cannot detect causality but only correlation between opportunity beliefs and built environments because the survey lacks important control variables. People's choice of neighborhood is based on many considerations, such as their economic condition, expectations of the future, and workplace. These factors may generate spurious association with the focal dependent variables and independent variables but they are not controlled in the model because the dataset does not include that information. Thus, the internal validity is low for the CCES observational survey. Moreover, the observational survey doesn't determine the causal mechanism between the focal dependent and independent variables.

Because of the low-level of internal validity of an observational survey, two-rounded survey experiments have been incorporated in this research to complement the nation-wide observational study. Randomized experiments are considered a "gold standard" among identification strategies (Keele 2015). With the experiments, the independence between the treatment and outcomes can be imposed by researchers, and randomization allows researchers to exclude confounding variables because randomly-assigned treated and control groups should be identical in all aspects, observable and unobservable (Keele 2015). The two-rounded survey

experiments are employed to explore the causation and causal mechanism between the built environment of neighborhoods and opportunity beliefs.

Another problem of this national survey is that the information about the focal independent variable is collected by asking respondents to subjectively evaluate the built environment of their neighborhood. Lacking of a unified standard of assessing the built environments may be a problem because people can have various standards of evaluation, then different evaluating standards may result in the measurement error of the built environment. Additionally, the endogeneity problem should be carefully treated for the neighborhood effects studies. Tiebout (1956) puts forward the public choice model and argues that when consumer-voters choose a community they can "vote with their feet." The CCES survey can't rule out the selection bias regarding residential location choices so that I can't detect whether the differences of the outcomes result from the neighborhood effects or the selective sorting process. If the latter one is the reason for the variances of residents' opportunity beliefs, then it is the residents' socio-economic status and personal choice generate various opportunity beliefs, rather than the physical environment of neighborhoods. Prior research has already demonstrated that the socio-economic status of a neighborhood has impacts on individuals' opportunity beliefs (see detailed argument in section 2.1.3), however, I argue that the socio-economic status of a neighborhood is not the only source for opportunity beliefs. The physical environment also plays an important role in the process.

Given the concern of subjective evaluations and criteria of neighborhoods and personal selection problem, again, experimentation is an appropriate choice to fix these issues. Prior research has demonstrated that conjoint and vignette survey experiments perform well in matching real-world behavior (Hainmueller, Hangartner, and Yamamoto 2015). For the two

survey experiments in this research, I retain control over assignment to random conditions, treatment, and measurement of subjects (McDermott 2002). Participants of this project are randomly assigned into two groups. In each group they receive the pictures of the exactly same neighborhood, including same houses, roads, lawns, etc. The only difference of the pictures in each group is if the neighborhood is well-maintained or badly-maintained. In this way, I can exclude the self-selection bias regarding residential location choices and study how the environment affects people's feelings, perceptions, and opinions. Benefiting from triangulation in this research, this study obtains high levels of both internal and external validity. Furthermore, respondents are also asked to compare the pictures with their own neighborhoods in real life. They can provide their opinions in an open-ended question, too. From their feedback, I can learn their perspectives about the neighborhood shown in the picture and obtain a rough impression of their own neighborhoods. This is an improvement of the measurement of the focal independent variable.

4.2 The Survey Experiment in Spring 2019

To fix the disadvantages of the CCES survey, I conducted two rounds of online survey experiment on Amazon's MTurk. The first-round survey experiment was imbedded in an omnibus survey module and implemented by the POLS-lab, the UNC Charlotte, in Spring 2019. Both survey experiments were developed in Qualtrics and computers randomly assigned respondents into different groups. According to my theory, the built environment plays a large role in forming residents' emotions and self-efficacy, and then affects their subjective opinions. In the online survey experiment in Spring 2019, 500 respondents were randomly assigned into two groups, and in each group they were shown with a picture about the same neighborhood but

with different maintenance conditions of the built environment. The pictures displayed the built environments in neighborhoods, including houses, sidewalks, roads, etc. Following the pictures, subjects were asked a list of questions about their emotions, self-efficacy, opportunity beliefs, etc.

4.2.1 Dependent Variables

Similar to the CCES national survey, the opportunity beliefs were measured with two dimensions, perceptions of opportunity and perceptions of equality of opportunity. The questions covering the two aspects in this survey were designed as ordinal questions with seven-point Likert scale, *Strongly Agree, Agree, Somewhat Agree, Neither Agree nor Disagree, Somewhat Disagree, Disagree,* and *Strongly Disagree*. First, since prior literature has demonstrated that parents' expectations significantly affect children's occupational and educational aspiration (Sewell, Haller, and Ohlendorf 1970), I explored the subjects' perceptions of opportunity by asking if they agree or disagree that there exist more opportunities for the next generation to get ahead in life. The "more opportunities" for next generation is defined as attendance of college, higher income, and higher social status in the future. I also asked the respondents generally whether they agree/disagree that there are a lot of opportunities for their children to get ahead in life. Then, I asked the subjects if they agree/disagree that everyone has the equal opportunities for getting ahead in life. This question is used to measure the perceptions of equality of opportunity.

4.2.2 Independent Variables

Usually, wealthy neighborhoods are better maintained than impoverished neighborhoods. Thus, the built environment of the middle-class and working-class neighborhoods may have more visual maintenance issues. Tienda (1991) argues that the assumptions of Tiebout public choice model, which claims consumers "vote with their feet" (Tiebout 1956), are "rigid and especially unrealistic" for low-income people. The low-income consumer-voters lack the knowledge of revenue and expenditures for public goods and are deficient in the options in selecting where to reside (Tienda 1991). Since the low-income are less likely to "choose" a neighborhood but have to "stay" in a neighborhood which they can afford, they are more likely to be affected by the environments of the neighborhoods compared to more opulent counterparts. Thus, in the experimental study, a working-class neighborhood was selected and respondents saw pictures displaying the neighborhood. The only difference between the two pictures is the quality of the built environment. The treatment group were shown with the neighborhood with a clean and well-maintained built environment, while the control group were shown with the same neighborhood with a badly-maintained built environment, regarding the maintenance of lawns and exterior painting (see Figure 4.2). The maintenance of lawns and exterior painting are not only individual behavior but also contribute to the provision of neighborhood condition as an impure public good. Though neighborhood condition is a public good, its provision is unique from other public goods considering the housing upkeep is highly relied on individual homeowners. Leonard (2016) reports that if public policy pays more attention to improve low-income neighborhoods, especially reducing absentee homeowners or abandoned properties, other residents will respond by increasing exterior housing upkeep.

(a) Well-maintained Built-environment (b) Badly-maintained Built-environment

Figure 4.2 Pictures of a Working-class Neighborhood
Source: The Google Street View

4.2.3 Mediators

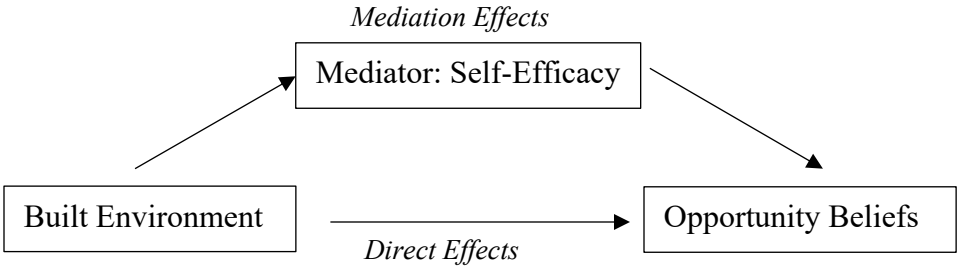

Figure 4.3 Causal Mechanism Between the Built Environment and Opportunity Beliefs

In order to identify the causal mechanism between the built environment in neighborhoods and opportunity beliefs, the experiment also included variables. According to the Opportunity Beliefs Theory, the built environment in neighborhoods will affect people's self-efficacy, then influence people's opportunity beliefs. Figure 4.3 displays the direct and mediation effects between the treatment and outcome. Specifically, I argue that people who live in a neighborhood with a well-maintained built environment are more likely to generate a high-level of self-efficacy, which mainly sources from positive emotions felt from the neighborhood. People who hold a high-level

of self-efficacy will perceive more opportunities and perceive that opportunities are distributed more equally in the society. In contrast, people who live in a neighborhood with a badly-maintained built environment will receive negative signals and form a low-level of self-efficacy. They will perceive less opportunities and less-equally distributed opportunities in the society.

After presenting the pictures of neighborhood, respondents in each group were asked to indicate their self-efficacy imagining they live in the neighborhood shown in the picture they saw. To better measure self-efficacy, I incorporated the General Self-efficacy Scale (Sherer et al. 1982), The Hope Scale (Snyder et al. 1991) and Aspiration Scale (Lybbert and Wydick 2019) together. I listed seven statements with positive or negative narratives about self-efficacy: (1) At the present time, I am energetically pursuing my goals (The Hope Scale); (2) If I should find myself in a jam, I could think of many ways to get out of it (The Hope Scale); (3) At this time, I am meeting the goals that I have set for myself (The Hope Scale); (4) It is better to have aspirations for my family than to accept each day as it comes (Aspiration Scale); (5) I feel insecure about my ability to do things (General Self-efficacy Scale); (6) I give up easily (General Self-efficacy Scale); and (7) It is better learn to accept the reality of things than to dream for a better future (Aspiration Scale). Both Snyder's concept of hope and Lybbert and Wydick's concept of aspirational hope develop from self-efficacy. I selected three items from the Hope Scale because the General Self-efficacy scale's the positive narratives about initiation/persistence is too broad. Thus, in the experiment design I specifically emphasize pursuing goals or insistence even facing impediments. The two items about aspirations emphasize the expectation for the future, which is consistent with the concept of self-efficacy. The respondents were asked to indicate if those statements truly or falsely described their conditions. These questions were

designed with six-point Likert scale from *Definitely False, Mostly False, Slightly False* to *Slightly Ture, Mostly True, and Definitely True*.

To further confirm that the main source of self-efficacy is psychological and emotional arousal, I incorporated questions about emotions right after presenting the treatment in the survey experiment (before self-efficacy questions). For the emotion variables, I created a bipolar matrix question in Qualtrics. In the right column of the bipolar matrix, I listed emotions of hopeful, depressed, safe, carefree, and powerless. Then in the left column of the bipolar matrix, I presented the opposite emotions correspondingly, including hopeless, cheerful, unsafe, anxious, and powerful. Positive psychologists categorize hope as psychological capital, just like efficacy (Avey, Luthans, and Youssef 2010). In contrast, Lazarus (1999) defines hope as an emotion. Some scholars define emotions as "multi-component, coordinated processes of psychological subsystems including affective, cognitive, motivational, expressive, and peripheral physiological processes" (Pekrun 2006; Damasio 2004; Scherer 1984). According to this definition, hope meets the criteria as an emotion. Therefore, in this research, hope is included as an emotion and tested with my online experiments. I also added powerful into the emotion list because previous research has demonstrated that neighborhood disorder affects people's perceptions of powerlessness (Geis and Ross 1998). Feeling powerful reduces the attention on other people's feelings and thoughts but makes people focus on their own tasks (Galinsky et al. 2006). Power leads to goal-directed behavior (Galinsky, Gruenfeld, and Magee 2003). I mixed the order of positive and negative emotions in each column in order to avoid possible question order effects (Schuman and Presser 1996; Moore 2002). The first row of the matrix indicated the scale of the emotions, sequentially from left to right displaying *Strongly, Moderately, Slightly, None,* then

Slightly, Moderately, and Strongly again. Thus, each emotion was measured with a seven-point scale.

4.2.4 Pre-treatment Measures

Although this is an experiment with randomization, a list of pre-treatment variables were also added into the experiment to validate whether the distribution of the sample in the treatment and control groups is balanced. At the end of the experiment, subjects answered demographic and socioeconomic questions, including age, gender, ethnicity, marital status, whether having children, education, employment status, family income[3], living area, political ideology, and political affiliation[4].

4.2.5 Data and Methods

Since this research focuses on the experience of living in the neighborhoods in the United States, three culture-check questions were designed to check if the respondents were familiar with the American culture and only the subjects who gave all three answers correctly were kept in the dataset. The first question shows a picture of hotdog (without naming it) and respondents were asked to indicate which holiday/event is most closely associated with the image. The right

[3] Income is a categorical variable with three categories of low income, middle income, and high income. Because of the restrictions of the data, family income less than $50,000 is categorized as low income, $50,000 - $119,999 is middle income, and $120,000 or more is high income. This is roughly consistent with the category of family income in the 2018 CCES data based on a new Pew Research Center report (Horowitz, Igielnik, and Kochhar 2020).
[4] The question of political affiliation was designed with 7 options: (1) Strong Democrat, (2) Democrat, not so strong, (3) Independent, lean towards Democrats, (4) Independent, don't lean toward either party, (5) Independent, lean towards Republicans, (6) Republicans, not so strong, and (7) Strong Republican. When recoding the variable, Independent, lean towards Democrats was assigned into Democrats, and Independent, lean towards Republicans was classified to Republicans, according to Keith et al. (1986). Keith et al. (1986) argues that this "leaning" should outweigh the independence when classifying respondents because most Independents are nearly as partisans as avowed Democrats or Republicans and "leaners vote like outright partisans."

answer is The World Series. The second question asked respondents how they interpret the date of 08/06/12. The correct answer is August 6, 2012. The last question asked respondents the term which is used to describe an outdoor party in the parking lot before a sports game, and the correct answer should be Tailgating. All three questions were time-sensitive and the participants must respond within 15 seconds or the survey experiment would advance automatically. In addition, the duration of participation of the survey experiment should reach a minimum of 180 seconds. Observations with less than 180 seconds were excluded from the dataset. After cleaning the data, I have 148 respondents in the treatment group (who saw the picture of the tidy neighborhood) and 170 respondents in the control group (who saw the picture of the untidy neighborhood).

Next, I did the balance test to check if the randomization works properly. If samples are not balanced in both groups, then other pretreatment covariates may affect the opportunity beliefs. If the randomization works well, subsequently, I made use of the Shapiro-Wilk test (Shapiro and Wilk 1965) (see Table A1 in the Appendix A) for the normality test. Since most dependent variables, mediator variables, and emotional variables violate the assumption of normality of data distribution, the non-parametric Wilcoxon-Mann-Whitney test (Wilcoxon 1945; Mann and Whitney 1947) has been employed to see if there are significant differences of emotions, self-efficacy, and opportunity beliefs between the treatment group (the well-maintained neighborhood) and control group (the badly-maintained neighborhood)[5].

After detecting the causality between the treatment and outcomes, I also conducted a general approach of causal mediation analysis (Imai et al. 2010; Imai, Keele, and Tingley 2010) to explore the causal mechanism between the built environment and opportunity beliefs. To

[5] Since some of these variables do not violate the assumption of normality of data distribution, I also report the results for the two independent samples *t*-test for all these variables in the Appendix.

implement the causal mediation analysis, first, I added all the seven-items of self-efficacy and created a new quasi-continuous variable of self-efficacy (from 7 to 42), I also added the four-items of perceptions of opportunity together (higher education, higher income, higher social status, and generally more opportunities) to create a quasi-continuous variable of perceptions of opportunity (from 4 to 28). Since both the mediator and the outcome variables are continuous, I used linear regressions for both the mediator and the outcomes in the causal mediator analysis.[6] I also added all emotional items together to create a quasi-continuous indicator for emotional status (from 5 to 35). When I create these new indicators, I make sure that all items have been recoded and keep the same direction. For example, one of the self-efficacy item is "I give up easily." I recoded it and ensure that the high value means high-level of efficacy, and low value relates to low-level of efficacy. This rule applies to all negative tone of self-efficacy and emotion items. I made use of Cronbach's alpha to measure the scale reliability for the three scale variables. The results of the alpha score for the three scale variables are listed in Table 4.1. According to the results, since the alpha score for the three variables are all above .90, the three measures are reliable[7].

Table 4.1 The Cronbach Alpha Score for Perceptions of Opportunity, Self-efficacy and Emotion

Variable	Min	Max	Average Interitem Covariance	Number of Items in the Scale	Alpha Score
Perception of Opportunity (Total)	4	28	2.33	4	.95
Self-efficacy (Total)	7	42	1.20	7	.90
Emotion (Total)	5	35	1.68	5	.90

[6] The variable of perceptions of (in)equality of opportunity is ordinal with 7 point Likert scales. Since the **mediation** package in R can't handle an ordered outcome variable (Imai et al. 2010), the variable of perceptions of (in)equality of opportunity has been taken as a continuous variable in the analysis.
[7] The three quasi-continuous variables have been included in the normality test, see Table A1 in the Appendix A.

To check the randomization, I compared the demographic and socioeconomic characteristics of each group with a list of pretreatment variables. Basically, the two groups are balanced, except for one variable of employment status. There is a significant higher percentage of people who are employed in the treatment group (79.73%) compared to the percentage in the control group (70.59%), according to the results from the logit model (Table 4.2). Table 4.3 demonstrates the binary logistic regression results between the treatment and control group. The employment status may have impacts on individuals' opportunity beliefs because occupation is a vital indicator for family social status (Otto 1975). Thus, I checked whether the employment status affects outcome variables, mediators and emotional variables in the treatment and control groups respectively with the Wilcoxon-Mann-Whitney test. There is no significant distinction between people who are employed and people who are not in the treatment group or control group for all the outcome, mediation, and emotional variables (see Table B1 in the Appendix B). Therefore, though the variable of employment status is identified as unbalanced, it affects the credibility of the results. The randomization works fairly successfully.

Table 4.2 Binary Logistic Regression Results for the Randomization of the Working-class Neighborhood, Survey Experiment in Spring 2019

Reference: Control group (untidy neighborhood)	Coefficients	(SD)
Age	.004	(.01)
Female	.04	(.26)
Race (Reference: White)		
Black	-.04	(.54)
Other race	.30	(.39)
Married	.16	(.28)
Having children	-.22	(.29)
Having college degree	-.39	(.25)
Employed	.67*	(.28)
Income (reference: Low income)		
Middle income	-.40	(.27)
High income	.16	(.46)
Living area (reference: Rural)		
Suburban	-.13	(.32)
Urban	-.65	(.37)
Ideology (reference: Liberal)		
Moderate	.03	(.39)
Conservative	-.41	(.56)
Party (reference: Democrat)		
Independent	.15	(.49)
Republican	.20	(.52)
Constant	-.25	(.56)
Number of Observations	318	

Note: * p < .05 ** p < .01 ***p < .001

4.2.6 Limitations

Because of the high-level of internal validity, the randomized experiment is used to identify the causality between the built environment in a neighborhood and opportunity beliefs. It

compensates one of the major disadvantages of the observational study. However, it also has its own limitations. One of the major disadvantages of this experiment is the sample cannot be large enough to have a high external validity like the nation-wide observational survey of CCES due to the limits of costs. In addition, all participants are Internet-users, and they take this experiment voluntarily. The self-selection may bias the sampling and the experimental results cannot be simply generalized to a larger population. For example, the participants may be highly-educated people with the access to the platform of our experiment. Thus, the external validity is low for the experiment. This disadvantage has already been be counterweighed by the CCES survey, which has a large sample across the nation. Another limitation of the online survey experiment is subjects are asked to imagine they live in the neighborhoods as the pictures display. In order to remedy one of the disadvantages of the CCES survey and unify the standards to evaluate the built environment in neighborhoods, I have shown respondents with the pictures of a working-class neighborhood. I involve the question by asking respondents whether the neighborhood shown by the picture is better, similar, or worse than their own neighborhood in real life. With this question, I can roughly collect information about their neighborhoods. However, the imagination of living in a neighborhood and forming emotions and opinions are different from the real context. In addition, one simple picture may not be enough for the imagination. I conducted a second-round survey experiment later. It is an independent online survey experiment. With less space limitations, I added more pictures about the working-class neighborhoods into the experimental design to provide more incentives for respondents when they imagine they live in the neighborhood. In this way, this disadvantage of the survey experiment in Spring 2019 can be ameliorated.

4.3 The Survey Experiment in Spring 2021

The first-round online survey experiment in 2019 is incorporated in an omnibus project conducted by the POLS-lab at the UNC Charlotte, it has time and space limitations. The study was expanded and adjusted, then I launched it on Amazon MTurk as an independent project in Spring 2021. The second-round online survey experiment is funded by the Thomas L. Reynolds Graduate Student Research Award at the UNC Charlotte.

To prevent the fatigue effects, the whole project was designed as a 10-minute online survey experiment. This project was pre-registered on AsPredicted, which is a platform and database managed by the Penn Wharton Credibility Lab, on March 1st, 2021. To avoid the contamination of the effects of the mediator on the outcomes, the full-scale online experiment survey includes 2 branches. Participants were randomly assigned into the 2 branches: (1) answering the questions of self-efficacy (mediator) then following the questions of their opportunity beliefs, and (2) just answering the questions of their opportunity beliefs. In each branch, again, respondents were randomly assigned into the treatment group (neighborhoods with well-maintained built environment) and the control groups (neighborhoods with badly-maintained built environment). They were shown with two pictures of the built environment of a neighborhood before answering the questions. Originally, 198 respondents are assigned to Branch 1 and 202 respondents are in Branch 2. Only respondents using more than 3 minutes for the survey experiment have been kept. In addition, since the research focuses on how Americans perceive opportunities, just like the survey experiment projected in Spring 2019, I added two questions to check if the respondents are familiar with American culture. The first question asks respondents how they interpret the date of 08/06/12. The other question asks respondents the term which used to describe an outdoor party in the parking lot before a sports game. The respondents must answer

the two questions correctly (August 6, 2012 for the first question and Tailgating for the second one) to remain in the analytic sample. Both questions are timed questions and the participants must respond within 15 seconds or the questions will advance automatically. After cleaning, the dataset includes 126 respondents in Branch 1 and 142 respondents in Branch 2. The frequency of respondents in the treatment and control groups in the two branches is presented in Table 4.3.

Table 4.3 Number of Respondents in Branch 1 and Branch 2

	Branch 1	Branch 2
Dependent Variable	Opportunity Beliefs	
Mediator	Self-efficacy	--
Well-maintained Neighborhood	60	79
Badly-maintained Neighborhood	66	63
Total	126	142

4.3.1 Dependent variables

Based on the online survey experiment conducted in spring 2019, I developed the questions to measure the perceptions of opportunity and perceptions of inequality of opportunity. To measure people's perception of opportunity, first I asked participants if they perceive more opportunities for children. The wording mirrored survey experiment in spring 2019. Respondents were asked if they think the next generation will have more education, higher income, a higher social status, and general more opportunities to get ahead in life. These questions are designed with six-point Likert-scale, *strongly agree, agree, somewhat agree, somewhat disagree, disagree,* and *strongly disagree*. I also added two new questions in the spring 2021 online survey experiment to measure the perceptions of opportunity. I asked the respondents if they perceive more opportunities for

themselves in the future, such as a higher income or a higher social status. These questions are also ordinal questions with six-point Likert-scale.

To measure the perceptions of inequality of opportunity, first I included the question for the online survey experiment in 2019 and asked the subjects if they agree/disagree that everyone has the equal opportunities for getting ahead in life. This question is a seven-point Likert-scale question, with one more neutral category of neither agree nor disagree. In addition, prior research has differentiated a general and a more personal belief in a just world. The general belief in a just world is whether individuals believe that people in society in general have what they deserve, while the personal belief in a just world concerns whether individuals believe that they themselves get what they deserve (Dalbert 1999; Alves and Correia 2010a). People tend to have a higher personal belief in a just world than a general belief in a just world (Dalbert 1999; Alves and Correia 2010b). When people endorse the personal belief in a just world, they are more likely to enjoy positive moods and a higher-level of self-esteem, and they are more satisfied with their lives (Dalbert 1999). Thus, I asked the respondents that if they think that they have equal opportunities for getting ahead in life, like everyone else. Different from a general question of the distributions of opportunities, this question asks people to think about themselves and compare their opportunities to others. Furthermore, this question is more consistent with the question included in the CCES survey. The question is an ordinal question with six-point Likert-scale, ranging from *Strongly Agree* to *Strongly Disagree*.

4.3.2 Independent variables

The independent variable is the built environment of a working -class neighborhood. Based on the design of the survey experiment in spring 2019, I include two pictures of one neighborhood

(see Figure 4.4). These pictures contrast maintenance of the sidewalks, houses and lawns. I also add two pictures that highlighted the contrast between a well-maintained and a poorly-maintained public road. The two additional pictures focusing on road maintenance emphasize an aspect of the neighborhood condition that is a public good. The maintenance of a neighborhood does not just rely on individual residents. The local government also shares the responsibility. The pictures that vary based on conditions of a main road are designed to elicit a response that considers the government's role in maintaining the neighborhood. The results will provide important policy implications for policy makers and scholars about improving neighborhoods and reducing poverty.

(a) Well-maintained Built-environment (b) Badly-maintained Built-environment

Figure 4.4 Pictures of a Working-class Neighborhood
Source: The Google Street View, Pictures from Online[8]

[8] For the pictures from online, rights of using the pictures have been approved by the original owner (the documentation will be provided on request). Per the request of the original owner, the name of the original owner or program is not listed here.

Furthermore, to better observe the effects the built environment on opportunity beliefs, the distinctions between environments in the treatment and control group are expanded in the survey experiment in spring 2021. The pictures in control group in survey experiment 2021 show a worse-maintained environment compared to the pictures in control group in 2019 survey experiment (see Figure 4.4).

4.3.3 Mediators

In order to explore the causal mechanism between the built environment in neighborhoods and opportunity beliefs, the survey experiment is designed with two branches. In Branch 1, the mediator of self-efficacy is incorporated, while in Branch 2, there is no mediator listed. Developed from the survey experiment in spring 2019, the mediator, self-efficacy, is measured by 7 items. Respondents need to answer true or false about the 7 statements: (1) I felt that I could energetically pursue my goals. (2) If I should find myself in a jam, I could think of many ways to get out of it. (3) I could meet the goals that I have set for myself. (4) I would believe that it is better to have aspirations for my family than to accept each day as it comes. (5) I would feel insecure about my ability to do things. (6) I would give up easily. (7) I would believe it is better to learn to accept the reality of things than to dream for a better future. All questions are ordinal with 6 scales, including *Definitely true, Mostly true, Slightly true, Slightly false, Mostly false,* and *Definitely false*.

Comparable to the 2019 survey experiment, I ask the respondents to rate their emotions when they imagine living in the pictured neighborhood. I listed six items in the questions, including positive emotions of hopeful, safe, and powerful, and negative emotions of depressed, anxious, and disgusted. Disgust is a new item to the survey experiment. It is a defensive emotion and is

positively associated with anxiety (Haidt, McCauley, and Rozin 1994). Since disgust is often related to hygiene (Haidt, McCauley, and Rozin 1994), a badly-maintained physical environment may arouse this adverse emotion. Comparable to the 2019 survey experiment, the order of these positive and negative emotions was alternated to avoid possible question order effects (Schuman and Presser 1996; Moore 2002). The participants answered one positive emotion followed by a negative one. In order to simplify the exhibition of these questions, all emotional questions are changed from a bipolar-matrix question in the experiment conducted in Spring 2019 to a traditional Likert-matrix question with four ordinal categories, *Not at all, Slightly, Moderately*, and *Strongly*.

4.3.4 Pretreatment Measures

Like the survey experiment conducted in spring 2019, pretreatment variables were incorporated in the survey experiment in spring 2021. Prior to the survey experiment, the participants are asked to indicate their living area (urban/suburban/rural), political affiliation, and political ideology. Additionally, more demographic and socio-economic questions are presented following the survey experiment, such as age, gender, race, marital status, whether having children under 18 years old or not, education, and employment status.

4.3.5 Data and Methods

The methods of data analysis here are comparable to the methods elaborated in section 4.2.5. I ran the logistic regression to check the randomization. Again, I added six items (higher income for self, higher social status for self, higher education for children, higher income for children, higher social status for children, and general more opportunities for children) together to create a

new quasi-continuous variable to indicate the perceptions of opportunity for each branch. I summed two items (perceive equal opportunity for self, and perceive equal opportunity in the society) to generate a new quasi-continuous variable to designate perceptions of equality of opportunity by each branch. I aggregated all emotional items as a total to denote the emotions in each branch. I also accumulated all self-efficacy items in Branch 1 to represent self-efficacy as a whole. Cronbach's alpha was used to check the scale reliability for these quasi-continuous variables. The alpha score for all the items are presented in Table 4.4 and Table 4.5 for each branch. Most items have a relatively high alpha score (above .78) which indicate a fairly high reliability. Generally, the desirable alpha value is around .7 or above (Taber 2018). Since perceptions of equality of opportunity just has an alpha score of .66 in Branch 2, it will not be incorporated in the data analysis.

Table 4.4 The Cronbach Alpha Score for Opportunity Beliefs, Self-efficacy and Emotion, Branch 1

Variable	Min	Max	Average Interitem Covariance	Number of Items in the Scale	Alpha Score
Perception of Opportunity (Total)	6	36	1.53	6	.95
Perceptions of Equality of Opportunity (Total)	2	13	1.97	2	.78
Self-efficacy (Total)	7	42	1.37	7	.92
Emotion (Total)	6	24	.47	6	.87

Table 4.5 The Cronbach Alpha Score for Opportunity Beliefs and Emotion, Branch 2

Variable	Min	Max	Average Interitem Covariance	Number of Items in the Scale	Alpha Score
Perception of Opportunity (Total)	6	36	1.33	6	.93
Perceptions of Equality of Opportunity (Total)	2	13	1.42	2	.66
Emotion (Total)	6	23	.45	6	.86

Then I made use of the Shapiro-Wilk test (Shapiro and Wilk 1965) to check the assumption of normality (Table A2 in the Appendix A). Again, many outcome variables, mediators and emotional variables violate the assumption of normality of data distribution. Thus, the non-parametric Wilcoxon-Mann-Whitney test (Wilcoxon 1945; Mann and Whitney 1947) has been employed to explore if there exist significant differences between the means of the treatment and control samples[9]. I will also employ the general approach of causal mediation analysis illustrated by Imai et al. (2010) and Imai, Keele, and Tingley (2010) to explore the causal mechanism between the built environment and opportunity beliefs.

I tested whether randomization works well in my survey experiment with a binary logistic regression with the treatment on pretreatment variables. Basically respondents are balanced in the treatment and control groups. In Branch 1, the randomization works successfully (Table 4.6). No significance is found for all demographic and socio-economic factors, including age, gender, race, marital status, whether having children under 18 years old or not, living area, employment status, political ideology, and political affiliation. The randomization works appropriately for Branch 1.

[9] Since some of these variables do not violate the assumption of normality of data distribution, I also report the results for the two independent samples *t*-test for all these variables in the Appendix.

The same demographic and socio-economic factors have also been included in the logit model to check the randomization for the treatment of Branch 2. The logit model detects that the variable of living area is unbalanced between the treatment and control groups in Branch 2 (Table 4.6). The result of the Wald test for the variable of living area in the logit model (Branch 2) is $\chi^2 = 16.07, df = 2, p = .0003$. In the treatment group (a well-maintained neighborhood) of Branch 2, 68.35% respondents are from suburban area, and only 13.92% and 17.72% respondents are from rural or urban areas respectively. While in the control group (a badly-maintained neighborhood) of Branch 2, the distribution of participants in different living areas is more balance, the percentages are 26.98%, 38.10%, and 34.92% for rural, suburban, and urban areas correspondingly. In this case, the living area probably also affects people's opportunity beliefs.

Table 4.6 Binary Logistic Regression Results for the Randomization of the Working-class Neighborhood, Survey Experiment in Spring 2021

Reference group Control group (untidy neighborhood)	Branch 1		Branch 2	
	Coefficients	(Std. Err.)	Coefficients	(Std. Err.)
Age	-.003	(.02)	-.003	(.02)
Female	-.80	(.41)	.54	(.44)
White[a]	-.04	(.55)	-1.00	(.63)
Married	.33	(.51)	-.78	(.51)
Having children	.15	(.49)	.17	(.53)
Having college degree	-.20	(.44)	-.78	(.47)
Employed	.25	(.55)	.08	(.49)
Family income (reference: *Low income*)				
Middle income	-.05	(.48)	.83	(.51)
High income	-.39	(.65)	.66	(.66)
Living area (reference: Rural)				
Suburban	-.19	(.59)	1.73**	(.57)
Urban	-1.06	(.70)	-.04	(.64)
Ideology (reference: Liberal)				
Moderate	-.34	(.79)	-1.50*[b]	(.74)
Conservative	-.54	(1.09)	.31	(1.05)
Party (reference: Democrat)				
Independent	.37	(.88)	2.08*[c]	(.93)
Republican	.23	(1.09)	.21	(1.02)
Constant	.80	(1.32)	.14	(1.20)
Number of Observations	123		142	

Note: * p < .05 ** p < .01 ***p < .001

[a] Since there are only 3 black respondents (2.83%) in Branch 1 and 6 black participants (4.23%) in Branch 2, the category of black and other race has been combined to one and is compared to white.

[b] Wald test result for ideology: $\chi^2 = 5.46$, $df = 2$, $p = .065$. Ideology does not significantly affect the treatment.

[c] Wald test result for party identity: $\chi^2 = 5.14$, $df = 2$, $p = .077$. Party identity does not significantly affect the treatment.

To solve this problem, I compared the means of all dependent, mediator, and emotional variables to check whether there exist significant differences among people from each living area in the treatment group and control group respectively. I employ the Kruskal Wallis test (Kruskal and Wallis 1952) because I need to compare three groups (urban, suburban, and rural) when the dependent variables are not normally distributed. There is no significant difference generated by the living area in the treatment group or control group (see Table B2 in the Appendix B). Therefore, based on all of the results from the Kruskal Wallis test, the unbalanced variable of living area does not produce bias in the results. The randomization works successfully for the survey experiment in Spring 2021.

4.3.6 Limitations

The advantages and disadvantages of the 2021 online survey experiment are similar to the survey experiment in 2019. Randomization ensures the high-level internal validity, and researchers can identify causality and the causal mechanism between the treatment and outcomes through experiments quite straightforwardly. One of the evident improvements of the survey experiment in spring 2021 compared to 2019, is that it is designed with two branches with or without the mediator. Excluding the mediator from the survey experiment can rule out contamination from the mediating variables and supports the assertion that the impacts on the outcomes are from the treatment. The 2021 survey experiment is also improved because it includes more pictures of the neighborhood to provide more information for the participants in the survey design. Moreover, I include more items to evaluate opportunity beliefs in this survey experiment. Some of the items are about expectations for respondents themselves, and some others are about expectations for their children. In this way, I can exam my hypothesis and theory more precisely.

However, there are limitations for all types of methods. The small sample of the survey experiment brings a low-level of external validity. Also, originally, approximately 200 respondents completed in each branch. After checking the time used for the survey experiment and culture check questions, only 126 observations (around 2/3) in Branch 1 and 142 records (around 3/4) in Branch 2 are retained for the data analysis. This may further decrease the external validity. Fortunately the randomization works properly suggesting that attrition should not affect the results of the survey experiment. Considering the 2021 survey experiment results alongside the 2018 CCES national survey and first-round survey experiment in spring 2019 provides multiple data points to assess my hypotheses.

CHAPTER 5 OBSERVATIONAL STUDY: RESULTS AND DISCUSSION

After listwise deletion and selection of low/middle income respondents, the final 2018 CCES working sample includes 678 respondents for data analysis. Results for two models are reported in this section. The first model is about the perceptions of opportunity. The dependent variable is whether the respondents agree/disagree that children today have more opportunities for getting ahead in life compared to children from their own generation. The second model is about the perceptions of inequality of opportunity. The dependent variable is whether the respondents agree/disagree that nowadays in the U.S., everyone has equal opportunities for getting ahead in life. The built environment of neighborhood will be measured with two primary independent variables in both models, the first is whether there are buildings in the respondent's neighborhood that need to be repaired or fixed up, and the second one is whether the roads and sidewalks in respondents' neighborhood are well-maintained. Since both dependent variables are ordinal while the parallel regression assumption is violated in both models based on the results of Brant test, the partial proportional odds ordered logit model has been applied to explore the correlation between opportunity beliefs and the built environment of neighborhoods with the nation-wide survey data. According to *Hypothesis 1*, if no buildings needed to be fixed, or the roads and sidewalks are well-maintained, then the respondents should perceive more opportunities for children today than themselves. Furthermore, they should also perceive more equal distribution of opportunities in the society as claimed by *Hypothesis 2*. Table 5.1 lists the descriptive statistics for all the variables.

Table 5.1 Descriptive Statistics, Weighted Analytic Dataset (n = 678)

Variables	Description	Mean	SD	Min	Max
Dependent Variable					
Children Have More Opportunities	Strongly Disagree = 1, Strongly Agree = 4	2.75	.91	1	4
Equality of Opportunity	Strongly Disagree = 1, Strongly Agree = 4	2.21	1.02	1	4
Primary Independent Variables					
No Buildings Need to be Repaired	Strongly Disagree = 1, Strongly Agree = 4	2.57	.96	1	4
Well-Maintained Roads & Sidewalks	Strongly Disagree = 1, Strongly Agree = 4	2.70	.89	1	4
Control Variables					
Other Neighborhood Characteristics					
A Mix of Race	Strongly Disagree = 1, Strongly Agree = 4	2.93	.94	1	4
Places Look Like Economically Unequal	Strongly Disagree = 1, Strongly Agree = 4	2.42	.93	1	4
New Development	Strongly Disagree = 1, Strongly Agree = 4	2.42	1.03	1	4
Individual-Level Variables					
Age	Age	47.03	17.90	18	87
ln(Age)	ln(Age)	3.77	.41	2.89	4.47
ln(Age)-squared	ln(Age)-squared	14.39	3.05	8.35	19.94
Female	Female = 1, Male = 0	.52	.50	0	1
Race	White = 1, Black = 2, Other race = 3	1.45	.77	1	3
Bachelor Degree or above	Bachelor degree and graduates = 1, no high school, high school and some college = 0	.28	.45	0	1
Marital Status	Currently married = 1, Ever married = 2, Never married = 3, Domestic/civil partnership = 4	2.00	.99	1	4
Having Children	Have child under 18 years old = 1, Do not have child under 18 years old = 0	.25	.43	0	1
Employment Status	Employed = 1, Unemployed = 2, Out of labor force = 3	2.02	.96	1	3
Home Ownership	Own house = 1, Do not own house = 0	.55	.50	0	1

Table 5.1 *Continued*

Variables	Description	Mean	SD	Min	Max
Living Area	Town and rural = 1, Suburban = 2, Urban = 3	1.92	.78	1	3
Political Ideology	Conservative = 1, Moderate = 2, Liberal = 3	1.92	.83	1	3
Perceive Great Income Inequality	Strongly Disagree = 1, Strongly Agree = 4	3.04	.95	1	4
Support Meritocracy	Strongly Disagree = 1, Strongly Agree = 4	2.75	1.01	1	4
Research Design Variable (Only in the model with the DV of equal opportunity)					
Compared to Richer vs. Poorer	Compare to people who are richer than me = 1, Compare to people who are poorer than me = 0	.51	.50	0	1

Table 5.2 reports the results of the partial proportional odds ordered logit model for opportunity beliefs with odds ratios. Both models are fairly parsimonious. Model 1 predicts *Children Have More Opportunities*, and only one variable out of 19 violates the proportional odds assumption (*No Buildings Need to be Repaired*). Model 2 predicts *Equal Opportunity*, and 3 variables out of 20 violate the proportional odds assumption (*Race*, *Having Bachelor Degree or above*, and *Political Ideology*). Since the dependent variable has four categories, Strongly Disagree, Somewhat Disagree, Somewhat Agree, and Strongly Agree, three will be 3 odds ratios generated for the variables which violate the proportional odds assumption. To generate the three odds ratios, there are three dummy variables created from the response variables by the partial proportional odds ordered logit models. The first odds ratio (the odds ratio with the superscript a in Table 5.2) generates from comparing the "*Strongly Disagree*" category with all other three categories, which means the first category of the dependent variable, *Strongly Disagree*, is recoded as 0, and the rest three categories are recoded as 1. The second odds ratio (the odds ratio with the superscript b in Table 5.2) shows the comparison between people who disagree and people who agree with the statement. In other words, to generate the second odds ratio, the first

two categories of the dependent variable, *Strongly Disagree* and *Somewhat Disagree*, are recoded as 0, and the last two categories of *Somewhat Agree* and *Strongly Agree* are recoded as 1. The third odds ratio (the odds ratio with the superscript c in Table 5.2) presents the difference between "*Strongly Agree*" and the prior categories. Thus, for the third odds ratio, the first three categories of the dependent variable are recoded as 0, and the last category of Strongly Agree is recoded as 1.

Comparing multiple coefficients/odds ratios for independent variables that violate the proportional odds assumption allows tracing changes in the impact of independent variables across the range of the ordinal dependent variable (Craemer 2009). The interpretation of the results of the partial proportional odds ordered logit model is comparable to a traditional ordered logit model. The only exception is for the multiple coefficients/odds ratios generated for variables that violate the proportional odds assumption (Craemer 2009). For the variables which violated the proportional odds assumption in Table 5.2, the odds ratios labeled with the superscript "a" estimate any response which is more agreeable ("*Somewhat Disagree,*" "*Somewhat Agree,*" and "*Strongly Agree*") than choosing "*Strongly Disagree*." The odds ratios labeled with the superscript "b" predict effects from agreeable responses ("*Strongly Agree*" and "*Somewhat Agree*") compared to not agreeable ones ("*Strongly Disagree*" and "*Somewhat Disagree*"). The odds ratios labeled with the superscript "c" are for the estimates of answering "*Strongly Agree*" compared to any less agreeable response ("*Somewhat Agree,*" "*Somewhat Disagree*" and "*Strongly Disagree*"). Odds ratios greater than 1 denote that it is more likely that the respondent will be in a higher category of the dependent variable than the current one with higher values on the explanatory variable. Reversely, odds ratios less than 1 signify that higher

values on the explanatory variable increase the likelihood of being in the current of a lower category of the dependent variable (Williams 2006).

Table 5.2 Partial Proportional Odds Ordered Logit Models for Opportunity Beliefs, Weighted

Variables	Model 1 Children Have More Opportunities		Model 2 Equal Opportunity	
	Odds Ratio	(Std. Err.)	Odds Ratio	(Std. Err.)
Built Environment				
No Buildings Need to be Repaired	1.63**[a]	(.28)		
	.73*[b]	(.10)	.99	(.12)
	.98[c]	(.14)		
Well-Maintained Roads & Sidewalks	.96	(.12)	1.47**	(.19)
Other Neighborhood Characteristics				
A Mix of Race	1.30*	(.14)	1.33**	(.14)
Places Look Like Economically Unequal	1.03	(.12)	1.11	(.15)
New Development	.97	(.10)	.93	(.10)
Individual-Level Variables				
ln(Age)	.30	(1.44)	31.43	(161.39)
ln(Age)-squared	1.19	(.78)	.62	(.43)
Female	.90	(.15)	.84	(.15)
Race – Reference: White				
Black	1.80	(.60)	1.14	(.43)
			1.01[a]	(.33)
Other Race	1.03	(.28)	2.76**[b]	(.84)
			1.60[c]	(.54)
			.57*[a]	(.14)
Bachelor Degree or above	1.12	(.22)	.60*[b]	(.14)
			1.55[c]	(.42)

Table 5.2 *Continued*

Variables	Model 1 Children Have More Opportunities		Model 2 Equal Opportunity	
	Odds Ratio	(Std. Err.)	Odds Ratio	(Std. Err.)
Marital Status – Reference: Currently Married				
Ever Married	.79	(.19)	.99	(.24)
Never Married	1.05	(.28)	.93	(.27)
Domestic/Civil Partnership	.81	(.36)	1.35	(.58)
Having Children	1.03	(.27)	.74	(.21)
Employment Status – Reference: Employed				
Unemployed	1.10	(.40)	.96	(.31)
Out of Labor Force	1.03	(.22)	.95	(.19)
Home Ownership	1.09	(.22)	1.70**	(.35)
Living Area – Reference: Town and Rural				
Suburban	1.52*[10]	(.32)	1.12	(.24)
Urban	1.34	(.32)	1.08	(.26)
Change of Past Year Household Income – Reference: Decrease				
Stay about the same	.90	(.23)	1.45	(.42)
Increase	.99	(.28)	2.31**	(.74)
Political Ideology – Reference: Conservative				
Moderate	.87	(.20)	.68	(.15)
			.44**[a]	(.12)
Liberal	.51**	(.13)	.39**[b]	(.11)
			1.10[c]	(.40)
Perceive Great Income Inequality	.89	(.11)	.54***	(.07)
Support Meritocracy	2.14***	(.25)	2.21***	(.26)

[10] According to Wald test results ($\chi^2 = 3.94, df = 2, p = .140$), the variable of living area does not significant affect perceptions of opportunity for children.

Table 5.2 *Continued*

Variables	Model 1 Children Have More Opportunities		Model 2 Equal Opportunity	
	Odds Ratio	(Std. Err.)	Odds Ratio	(Std. Err.)
Research Design Variable				
Compared to Richer vs. Poorer	--	--	.70	(.13)
	2.31[a]	(20.79)	.001[a]	(.01)
Constant	3.18[b]	(28.55)	.0001[b]	(.001)
	.14[c]	(1.26)	8.73e-06[c]	(.0001)
Number of Observations		678		

Notes: Dependent variable coding: (1) Strongly Disagree; (2) Somewhat Disagree; (3) Somewhat Agree; (4) Strongly Agree for children having more opportunities/everyone having equal opportunities for getting ahead in life. For variables that violate the proportional odds assumption:
[a] Odds ratio for any response more agreeable than Strongly Disagree.
[b] Odds ratio for agreeable responses compared to not agreeable ones.
[c] Odds ratio for Strongly Agree compared to any less agreeable response.
* p < .05 ** p < .01 ***p < .001

5.1 Results for Perceptions of Opportunity

Based on the results from Table 7, for the two variables which are used to measure the built environment of neighborhoods, *No Buildings Need to be Repaired* is the only one which has statistically significant impact on the opinions of whether children having more opportunities today compared the respondents' own generation. Because the variable of *No Buildings Need to be Repaired* violates the proportional odds assumption, it has three odds ratio. The first odds ratio (labeled with the subscript "a") indicates that the odds of respondents' agreement versus strong disagreement with the statement that children have more opportunities today will be 1.63 times greater when there are less buildings that need to be fixed in their neighborhoods. This is consistent with *Hypothesis 1*. However, the second odds ratio (labeled with the subscript "b") implies that respondents are 17% less likely to perceive that children will have more opportunities than their own generation if buildings in respondents' neighborhoods do not need

to be repaired. In addition, the third odds ratio (labeled with the subscript "c") suggests how maintenance of buildings will affects the probability of "*Strongly Agree*" compared to the other categories. The result for "*Strongly Agree*" is not significant. Hence, living in a neighborhood with a better condition of buildings dos not necessarily predict residents' probabilities of strongly agreeing that there will be more opportunities accessed by children. Overall, respondents are less likely to strongly disagree that children will have more opportunities in the presence of well-maintained buildings, but they are not more likely to strongly agree. In addition, another variable for measuring the built environment, the maintenance of roads and sidewalks, does not significantly affect respondents' perceptions of opportunity. Thus, *Hypothesis 1* is only partially supported by the outcomes presented in Table 5.2, Model 1. People living in a neighborhood with fewer building needed to be repaired are less likely to strongly disagree that today children have more opportunities than their own generation. Otherwise, the results do not support *Hypothesis 1*.

The lack support for *Hypothesis 1* may be due to the narrative of the question. The question states that "Children today have more opportunities for getting ahead in life compared to children from my own generation." First, this is a longitudinal comparison between perceptions of opportunity for children today and for children in the respondents' own generation, rather than comparing perceptions of opportunity among children living in different neighborhoods at the same era. Thus, the neighborhood environment variables are not statistically significant in this model. Moreover, the question asks a general opinion regarding opportunities for all children today, instead of asking specifically about the opinions on the opportunities accessed for respondents' own children. Respondents may think that the opportunities change for all children

today, in general. This opinion may not vary among residents from different neighborhoods. This problem will be addressed in the two online survey experiments.

In addition to the factors of built environment, other control variables also significantly affect people's perceptions of children's opportunity. The racial composition of a neighborhood significantly affects perception of opportunity for children. Respondents from more racially diverse neighborhoods are 1.30 times more likely to perceive more opportunities for children today. This may be because that people's exposure to a racially diverse environment increases their beliefs about the progress of social equality, then they are more willing to believe that numerous opportunities are accessible for children today. In addition, according to Wald test ($\chi^2 = 8.15, df = 2, p = .017$), respondents' political ideology also significantly influences their opinion on opportunities for children today. Compared to people who are ideologically-conservative, ideologically-liberal individuals are 49% less likely to believe that children today have more opportunities. Prior literature claims that normally liberals express more favorable attitudes towards disadvantaged groups than conservatives assert (Jost, Federico, and Napier 2009). In this way, liberals should pay more attention to social equality than conservatives. Thus, liberal individuals may perceive less opportunities for children today than their conservative counterparts. Other than that, respondents who support the value of meritocracy are more likely to believe that children today have more opportunities than their own generation. The odds of more agreeable with the statement regarding opportunities for children are 2.14 times greater when respondents accept the ideology of meritocracy. Accepting the meritocracy value indicates an emphasis on the personal efforts for success. In this way, people should perceive more opportunities. There is no significant impact on perceptions of more opportunities accessed by children today from demographic or socio-economic elements.

5.2 Results for Perceptions of Inequality of Opportunity

Regarding opinions on equal opportunity, the built-environment variable, *Well-Maintained Roads & Sidewalks*, plays a significant role in affecting people's perceptions of inequality of opportunity. This variable does not violate the proportional odds assumption, so it only has one odds ratio listed in Table 5.2, Model 2, and can be interpreted like traditional ordered logit models. According to the results, residents from a neighborhood with well-maintained roads and sidewalks are 1.47 times as likely to perceive that the opportunities are equally distributed in the U.S. The variable of *No Buildings Need to be Repaired* is not statistically significant in this model. Perhaps respondents assume that the maintenance of buildings is a responsibility of individuals. Hence, whether a neighbor renovates their house in a timely manner or not does not have an impact on other residents' perceptions of inequality of opportunity. In contrast, local governments typically take responsibility for maintaining public roads and sidewalks. Residents can review whether there is enough investment in and attention towards their neighborhoods by the local governments through the maintenance of roads and sidewalks. Better-maintained public roads and sidewalks in a neighborhood suggest that the local government manages the community well. This may be one of the possible reasons that the conditions of roads and sidewalks can affect people's perceptions of inequality of opportunity. Thus, *Hypothesis 2* is supported. According to the Opportunity Beliefs Theory, the maintenance of roads and sidewalks presents the visual stimulation for the residents and prompts emotions and self-efficacy evaluations. These emotions and self-efficacy evaluations will affect people's perceptions of (in)equality of opportunity. The mechanism will be explored in the online survey experiments.

The control variables also have significant impacts on perceptions of equality of opportunity. Individuals who live in a racially diverse neighborhood have a 1.33 times higher likelihood of

believing that opportunities are equally distributed in society. The proportional odds constraint is freed for other race. According to Wald test ($\chi^2 = 17.81, df = 4, p = .001$), racial identity significantly influences perceptions of inequality of opportunity. There is no significant difference between white and black. But compared to other racial minorities, white people are less likely to agree with the equal opportunity argument.

Education also has an important impact on perceptions of inequality of opportunity. The proportional odds constraint is freed for the educational factor, too. People with a bachelor's degree or above are 43% less likely to assent that nowadays everyone has equal opportunities for getting ahead in life versus strong disagreement with the equal opportunity claim. Then, there is a 40% lower likelihood of agreeing with the statement of equal opportunity than disagreeing with it when respondents have bachelor degree or above. The significance disappears when comparing "*Strongly Agree*" to any less agreeable response. There are two potential explanations for the results. First, when people pursue higher educational attainment, they may face more challenges or even barriers, especially considering the dataset only includes people with low/middle income. Their personal experiences may affect their attitudes towards inequality of opportunity. Second, people with more education may hold a high criteria for fairness. This will also cause low approvement of equality of opportunity in current society. Furthermore, home ownership positively affects perceptions of equality of opportunity. People who are home owners perceive 1.70 times more likely to perceive equally distributed opportunities for getting ahead in life than fellows who do not own houses. Wald test ($\chi^2 = 8.47, df = 2, p = .014$) also reveals that change of past year household income significantly affects perceptions of inequality of opportunity. People who have undergone an increase of past year household income perceive 2.31 times more equally distributed opportunities than people whose past year household income

decreases. Both variables of education and income change suggest that individual experience plays an important role in forming the person's perception of inequality of opportunity.

Wald test ($\chi^2 = 21.19, df = 4, p = .0003$) confirms that political ideology has a significant impact on perceptions of inequality of opportunity. The proportional odds constraint is released for liberal ideology. Liberals have 56% lower likelihood to support equal opportunity opinion than strongly disagree the statement of equal opportunity, compared to their conservative counterparts. The odds of agreeable responses versus not agreeable ones are 61% lower for liberals than conservatives. There is no significant difference regarding political ideology when compare "Strongly Agree" equal opportunity with any less agreeable response. Moreover, endorsing the value of meritocracy brings 2.21 times higher likelihood of perceiving more equally distributed opportunities in the society. Other than meritocracy, another subjective control variable also significantly influences the results. When respondents perceive a large income gap between rich and poor, there is a 46% lower likelihood that they believe that the opportunities are equally distributed in the society. Thus, subjective perceptions of income inequality are essential for forming subjective perceptions of fairness, and may affect political trust and stability furthermore.

5.3 Discussion

The results from the 2018 CCES data are mixed but informative. One of the measures of built environment of neighborhoods significantly affects opportunity beliefs, in support of *Hypothesis 2*. This observational survey reveals the correlation between built environment and opportunity beliefs. Notably, well-maintained roads and sidewalks lead to greater perceptions of equal opportunity.

Living in a racially diverse neighborhood, political ideology and beliefs in meritocracy play important roles in influencing individuals' opportunity beliefs. These three factors significantly affect both kinds of opportunity beliefs. In interpreting these results, it is important to remember that the dataset only includes low and middle income people, and they may have limited choices for selecting a neighborhood, especially low-income residents. While the data do not permit a control for neighborhood selection effects, the results demonstrate benefits of racial diversity in a neighborhood. The results provide some insights for studies about residential preferences and impacts of neighborhood racial composition. Next, people who are politically liberal are prone to refuse the idea that children today more opportunities than previous generations. They are also less likely to agree that opportunities are distributed equally in the society. This is easy to understand considering higher standards of fairness held by the liberals. The different perceptions towards opportunities have broader implications and can be used to explain different stances towards redistribution policies hold by liberals and conservatives (Herwartz and Theilen 2017). As for beliefs in meritocracy, validating meritocracy means that believing in personal efforts weigh more than family background in achieving success. The findings regarding meritocracy suggest that individuals who focus more on their own efforts and abilities may perceive more opportunities and they are more likely to approve the current distribution of opportunities, which indirectly support my theory that higher-level of self-efficacy promotes people's opportunity beliefs. Next step is utilizing survey experiments to explore the causal inference and detect the causal mechanism between the built environment in neighborhoods and opportunity beliefs. Also, the wording of the question about perceptions of opportunity has been improved in online survey experiments subsequently.

CHAPTER 6 THE SURVEY EXPERIMENT IN 2019: RESULTS AND DISCUSSION

The survey experiment in Spring 2019 includes 318 observations after deleting missing data and excluding respondents who finished the survey experiment with less than 3 minutes or did not correctly answer the three culture-check questions. 148 participants were randomly assigned into the treatment group (well-maintained neighborhood) while 170 respondents were randomly assigned to the control group (badly-maintained neighborhood). In this section, I will test the causality between the built environment and opportunity beliefs. I will also explore the causal mechanism between the two factors. Based on the Opportunity Theory, respondents who are in the treatment group should perceive more opportunities for their children, and be more likely to believe that opportunities are equally distributed in the society, than respondents in the control group. The difference should be caused by the higher-level self-efficacy owned by the respondents in the treatment group. Table 6.1 displays the descriptive statistics for all variables in the survey experiment of 2019.

Table 6.1 Descriptive Statistics, Survey Experiment in Spring 2019

Variables	Treatment Group Well-Maintained Neighborhood		Control Group Badly-Maintained Neighborhood	
	Mean	(SD)	Mean	SD
Dependent Variables				
Higher Education	4.85	(1.57)	3.67	(1.73)
Higher Income	4.09	(1.54)	3.33	(1.50)
Higher Social Status	4.26	(1.57)	3.54	(1.67)
More Opportunities	4.51	(1.63)	3.53	(1.68)
Perception of Opportunity (Total)	17.72	(5.83)	14.06	(6.14)
Perceptions of Equality of Opportunity	3.17	(1.73)	3.16	(1.83)
Primary Independent Variable				
Treatment	1	(0)	0	(0)
Mediator				
Pursuing Goals	4.19	(1.37)	3.42	(1.41)
Out of Jam	4.24	(1.30)	3.54	(1.35)
Meeting Goals	3.94	(1.45)	3.01	(1.42)
Have Aspiration	4.25	(1.30)	3.89	(1.40)
Insecure about Ability	2.93	(1.44)	3.78	(1.34)
Give Up Easily	2.47	(1.34)	3.06	(1.45)
Accept Reality	2.98	(1.52)	3.31	(1.54)
Self-Efficacy (Total)	29.25	(7.68)	24.72	(7.80)
Emotional Items				
Hopeful	4.5	(1.50)	3.11	(1.32)
Depressed	3.8	(1.63)	4.91	(1.46)
Safe	4.59	(1.69)	2.84	(1.51)
Carefree	4.21	(1.54)	2.95	(1.37)
Powerful	3.8	(1.31)	2.7	(1.19)
Emotion (Total)	21.3	(6.56)	14.7	(5.39)
Control Variables				
Age	38.51	(11.46)	37.95	(10.68)
Female	.39	(.49)	.41	(.49)

Table 6.1 *Continued*

Variables	Treatment Group Well-Maintained Neighborhood		Control Group Badly-Maintained Neighborhood	
	Mean	(SD)	Mean	SD
Race [a]	1.29	(.67)	1.25	(.61)
Married	.44	(.50)	.44	(.50)
Having children	.27	(.45)	.32	(.47)
Having college degree	.45	(.50)	.55	(.50)
Employed	.8	(.40)	.71	(.46)
Family income [b]	1.55	(.65)	1.62	(.62)
Living Area [c]	2.01	(.65)	2.14	(.67)
Political Ideology [d]	1.67	(.83)	1.71	(.85)
Party [e]	1.64	(.88)	1.67	(.90)
Number of observations	148		170	

Notes:
[a] Race has three categories, white is coded as 1, black is coded as 2, and other race is coded as 3.
[b] Family income has three categories, low income is coded as 1, middle income is 2, and high income is 3.
[c] Living area has three categories, urban is coded as 1, suburban is coded as 2, and rural is coded as 3.
[d] Political ideology has three categories, liberal is coded as 1, moderate is coded as 2, and conservative is 3.
[e] Party has three categories, democrat is coded as 1, independent is coded as 2, and republican is coded as 3.

6.1 Results 1: Opportunity Beliefs

During the survey experiment, respondents were asked to indicate their opinions towards the opportunities they expect for their children and their perceptions of inequality of opportunity. I compared the means of each response variable in the treatment and control groups. The dependent variables are not interval variables (just ordinal) and not normally distributed based on Shapiro-Wilk test results, and they only have two independent groups, thus, I made use of Wilcoxon-Mann-Whitney test to check if there are significant differences of these response variables between the two groups. If the $p < .5$, the null hypothesis will be rejected and there is significant difference between the distributions of the variable.

Figure 6.1 exhibits the means of opportunity beliefs with the 95% confidence intervals. Table 6.2 reports the *z*-Value for each response variable. According to Figure 6.1, there are no overlaps between the intervals in the treatment and control groups for variables of higher education, higher income, higher social status and more opportunities for children. All the intervals of these variables are higher in the treatment group (the tidy neighborhood) than in the control group (the untidy neighborhood). With the inspection of the independent sample Wilcoxon-Mann-Whitney test, respondents who were in the treatment group perceived significantly more opportunities for their children, including higher educational achievement ($\bar{X}t$ = 4.85 vs. $\bar{X}c$ = 3.67)[11], higher income ($\bar{X}t$ = 4.09 vs. $\bar{X}c$ = 3.33), and higher social status ($\bar{X}t$ = 4.26 vs. $\bar{X}c$ = 3.54) in the future, as well as generally perceived more opportunities for children ($\bar{X}t$ = 4.51vs. $\bar{X}c$ = 3.53) to get ahead in life in the future. The mean of the scale variable of perceptions of opportunity (total) ($\bar{X}t$ = 17.72 vs. $\bar{X}c$ = 14.06) is also significantly higher under the treatment than under the control condition. Therefore, *Hypothesis 1* is supported by the results. However, nearly no difference of the confidence intervals for perceptions of equality of opportunity ("Equality of Opportunity" in Figure 6.1) was detected in this experiment so *Hypothesis 2* is not supported. The *z*-value in Table 6.2 is insignificant for perceptions of equality of opportunity ($\bar{X}t$ = 3.17 vs. $\bar{X}c$ = 3.16). Thus, the Opportunity Beliefs Theory is partially supported by the results from the survey experiment in 2019. The possible reasons of the insignificances for the perceptions of inequality of opportunity may be because a simple picture did not provide enough incentives for the respondents. This disadvantage is improved by adding more pictures into the 2021 survey experiment.

[11] $\bar{X}t$ denotes the sample mean in the treatment group (the tidy neighborhood), $\bar{X}c$ denotes the sample mean in the control group (the untidy neighborhood).

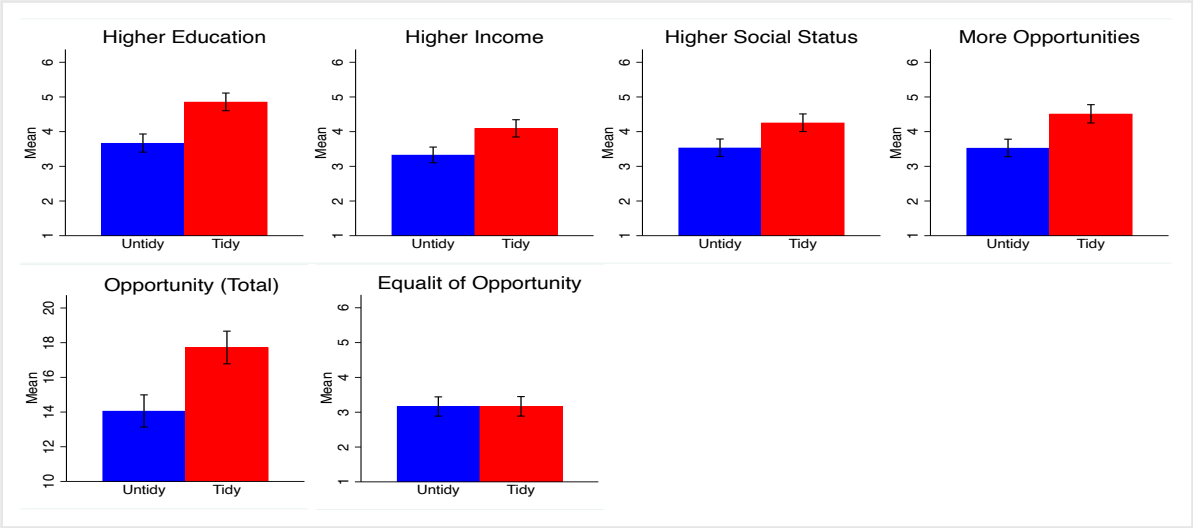

Figure 6.1 Means of Opportunity Beliefs with 95% CI, 2019
Notes: The treatment group is the tidy neighborhood. The control group is the untidy neighborhood.

Table 6.2 Wilcoxon-Mann-Whitney Test of Opportunity Beliefs by Treatment, 2019[12]

Opportunity Beliefs	*z*-Value
Expect higher education for children	-6.04***
Expect higher income for children	-4.49***
Expect higher social status for children	-4.00***
Expect more opportunities for children	-5.13***
Perceptions of Opportunity (Total)	-5.42***
Perceptions of Equality of Opportunity	-.19

Notes: * p < .05 ** p < .01 ***p < .001

[12] Two independent samples *t*-test results please see Table C1 in the Appendix C. The results are similar with Wilcoxon-Mann-Whitney test results.

6.2 Results 2: Mediators

6.2.1 Causal Mediation Analysis: The Mediator of Self-Efficacy

To fully understand the causality between the built environment and opportunity beliefs, I added the mediator, self-efficacy, into the survey experiment. Figure 6.2 plots the mean comparisons for all self-efficacy variables with 95% confidence intervals. Table 6.3 collects the Wilcoxon-Mann-Whitney test results for mediators. Seven statements of self-efficacy were contained in the experiment: (1) At the present time, I am energetically pursuing my goals ($\bar{X}t$ = 4.19 vs. $\bar{X}c$ = 3.42). (2) If I should find myself in a jam, I could think of many ways to get out of it ($\bar{X}t$ = 4.24 vs. $\bar{X}c$ = 3.55). (3) At this time, I am meeting the goals that I have set for myself ($\bar{X}t$ = 3.94 vs. $\bar{X}c$ = 3.01). (4) It is better to have aspirations for my family than to accept each day as it comes ($\bar{X}t$ = 4.26 vs. $\bar{X}c$ = 3.89). (5) I feel insecure about my ability to do things ($\bar{X}t$ = 2.93 vs. $\bar{X}c$ = 3.78). (6) I give up easily ($\bar{X}t$ = 2.47 vs. $\bar{X}c$ = 3.06). (7) It is better learn to accept the reality of things than to dream for a better future ($\bar{X}t$ = 2.98 vs. $\bar{X}c$ = 3.31). All the items which positively describe the self-efficacy have larger means in the treatment group than the means in the control group, reversely items with negative narratives about self-efficacy receive higher means under the control condition than under the treatment condition. The scale variable of self-efficacy (total) is also higher in the treatment group than in the control group ($\bar{X}t$ = 29.25 vs. $\bar{X}c$ = 24.72). All confidence intervals in Figure 6.2 do not overlap between the treatment and control groups, except for “Have Aspiration” and “Accept Reality.” With the Wilcoxon-Mann-Whitney test, the *z*-values indicate that differences between treatment and control conditions are statistically significant except for only one item, “Accept Reality.” Therefore, the results have demonstrated that residents who saw in a well-maintained neighborhood were more likely to report a high-

level of self-efficacy. It comports well with the first part of the Opportunity Beliefs Theory, which focuses on the relationship between the self-efficacy and environmental incentives. *Hypothesis 3* is supported.

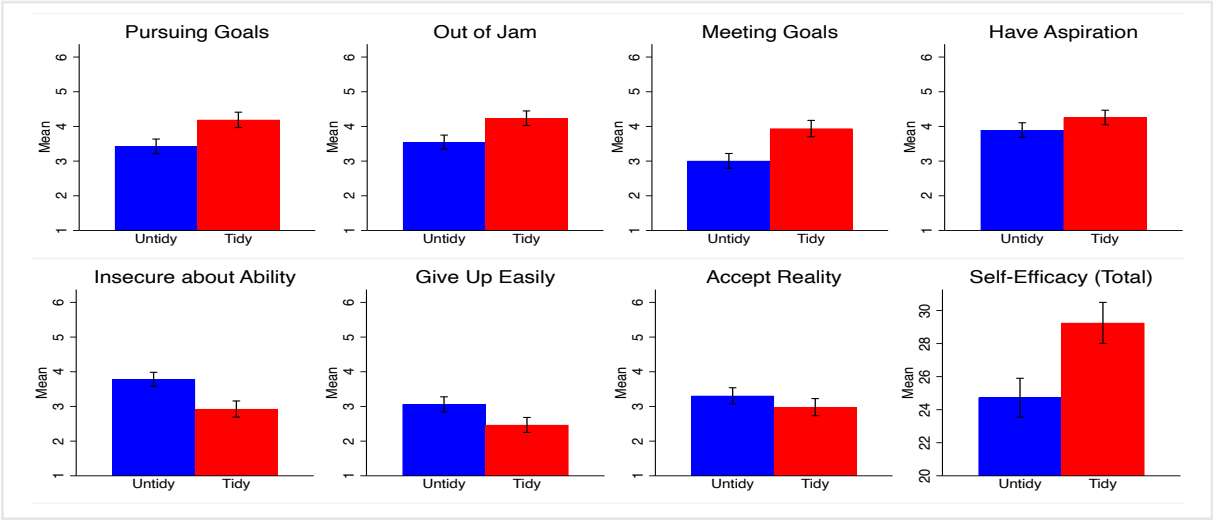

Figure 6.2 Means of Self-efficacy with 95% CI, 2019
Notes: The treatment group is the tidy neighborhood. The control group is the untidy neighborhood.

Table 6.3 Wilcoxon-Mann-Whitney Test of Self-Efficacy by Treatment, 2019[13]

Self-Efficacy	*z*-Value
Pursuing Goals	-4.79***
Out of Jam	-4.71***
Meeting Goals	-5.60***
Have Aspiration	-2.45*
Insecure about Ability	5.24***
Give Up Easily	3.67***
Accept Reality	1.91[a]
Self-Efficacy (Total)	-5.18***

Notes: * p < .05 ** p < .01 ***p < .001
[a] The *p*-value is almost significant, *p* = .057.

[13] Two independent samples *t*-test results please see Table C2 in the Appendix C. The results are similar with Wilcoxon-Mann-Whitney test results.

Hitherto, I have established that the physical environment significantly affects residents' self-efficacy and opportunity beliefs, I still can't confidently conclude that there is a causal link between self-efficacy and opportunity beliefs. Therefore, to validate the causal mechanism put forward by the Opportunity Beliefs Theory, which is that the built environment in a neighborhood influences residents' opportunity beliefs through self-efficacy, I conducted a causal mediation analysis which has been improved by Imai et al. (2010) and Imai, Keele, and Tingley (2010). I ran the causal mediation analysis and sensitivity analysis in R 2021.09.0 and use the mediation R package (Tingley et al. 2014). All control variables, including age, gender, race, marital status, whether having children under 18, education, employment status, family income, living area, political ideology, and party identity, have been included in the causal mediation analysis to increase the credibility of sequential ignorability. I also relaxed the no-interaction assumption to explore whether the average causal mediation effects (ACME) depended on the treatment. I reported the mediation effects on perceptions of opportunity in Table 6.4, without or with the interaction term treatment-mediation in the model. Table 6.5 displays the mediation effects on perceptions of equality of opportunity, with or without the treatment-mediation interaction in the model.

According to Table 6.4, the Opportunity Beliefs Theory is perfectly supported in the section of perceptions of opportunity. Self-efficacy generates a strong influence upon the impact of the built environment of neighborhoods on perceptions of opportunity. Without the treatment-mediation interaction variable (column 1), 51% proportion of total effect is generated by the mediator. When incorporating the interaction term, under the control condition (column 3), 45% total effects are from the mediator, and under the treatment condition (column 2), the proportion is 58%. People in the treatment group seemed to be affected more by the mediator (58% versus

45%), but the interaction is not statistically significant (p = .23). All average effects (mediation, direct and total) are positive and statistically significant. Residents from a well-maintained neighborhood will have a high-level of self-efficacy, and then they will perceive more opportunities. Thus, *Hypothesis 4* is supported by the data.

Table 6.4 Self-Efficacy Mediates Built Environment Treatment Effect on Perceptions of Opportunity, 2019

	Product of Coefficients		
	Perceptions of Opportunity (Total)		
Average Effect	No Interaction	With Interaction	
		Treatment	Control
Mediation	1.99*** [1.18, 2.89]	2.26*** [1.33, 3.34]	1.77*** [.95, 2.76]
Direct	1.93*** [.56, 3.22]	2.11** [.69, 3.46]	1.63* [.34, 2.91]
Total	3.91*** [2.55, 5.27]	3.89*** [2.47, 5.32]	
Proportion of Total Effect via Mediation	.51*** [.32, .82]	.58*** [.36, .88]	.45*** [.25, .77]

Notes: * p < .05 ** p < .01 ***p < .001
The outcome variables is perceptions of opportunity (total). The mediator indicates individuals' self-efficacy (total). Each cell includes a point estimate with its 95% confidence intervals in brackets.

In contrast, I do not find a significant mediation effect for perceptions of equality of opportunity. Based on Table 6.5, all the ACME (row 1), the average direct effects (row 2) and the average total effects (row 3) are not statistical significant, either without or with the interaction item. Neither the treatment of the built environment nor the mediator of self-efficacy significantly affects the perceptions of equality of opportunity. The proportion of total effects via mediation is 41% in the treatment group and only 7% for the control group, but no effects have statistical significance. The treatment-mediation interaction is not statistically meaningful, either.

Hence, *Hypothesis 5* is not supported by the data from survey experiment in Spring 2019. As I stated before, it is possibly because the simple picture did not provide the enough incentive for the respondents and did not influence their self-efficacy. Besides, respondents' opinions on the opportunities accessed by children may be easier to be manipulated, while it is hard to change their general opinion about the status quo of fairness in society.

Table 6.5 Self-Efficacy Mediates Built Environment Treatment Effect on Perceptions of Equality of Opportunity, 2019

	Product of Coefficients		
	Perceptions of Equality of Opportunity (Total)		
Average Effect	No Interaction	With Interaction	
		Treatment	Control
Mediation	.10 [-.01, .22]	.14 [-.03, .31]	.06 [-.11, .23]
Direct	-.05 [-.38, .31]	-.01 [-.41, .37]	-.09 [-.48, .28]
Total	.05 [-.28, .42]	.05 [-.31, .40]	
Proportion of Total Effect via Mediation	2.04 [-6.88, 9.35]	.41 [-12.82, 11.57]	.07 [-7.41, 7.62]

Notes: * p < .05 ** p < .01 ***p < .001
The outcome variables is perceptions of equality of opportunity. The mediator indicates individuals' self-efficacy (total). Each cell includes a point estimate with its 95% confidence intervals in brackets.

6.2.2 Sensitivity Analysis: The Mediator of Self-Efficacy

According to Imai, Keele, and Tingley (2010), the estimated quantity of causal mediation analysis can be given a causal interpretation when the sequential ignorability assumption is satisfied. Two assumptions constitute sequential ignorability: (1) given the observed pretreatment covariates, the treatment variable is "independent of all potential values of the outcomes and mediators" (Imai, Keele, and Tingley 2010), and (2) the mediator is "independent

of all potential outcomes given the observed treatment and pretreatment covariates" (Imai, Keele, and Tingley 2010). A randomized experiment can realize the first assumption about the ignorability of treatment assignment, but cannot guarantee the second assumption of the ignorability of the mediator. Thus, conducting a sensitivity analysis is necessary to assess the robustness of empirical results and check whether they violate the assumptions of sequential ignorability. I implemented the sensitivity analysis with a relax action of the no-interaction assumption.

The sensitivity analysis for causal mediation proposed by Imai, Keele, and Yamamoto (2010) is based on the correlation between the error of the mediation model and the error of the outcome model. The correlation of the two residuals is denoted as ρ, which is the sensitivity parameter. $\rho = 0$ implies that the sequential ignorability is satisfied. If there exist unobserved pre-treatment confounders which impact both mediator and outcome variables, the correlation across the two error terms will arise and $\rho > 0$. The sequential ignorability assumption may be violated if a small departure from $\rho = 0$ generates ACME which is largely different from the estimate attained under sequential ignorability (Imai, Keelye, and Tingley 2010). The sensitivity analysis helps scholars to observe how large ρ in a study can cause the causal mediation effect to disappear, which means that the confidence intervals for the mediation effects include 0. Imai, Keelye, and Tingley (2010) illustrates that the ACME can be expressed as a function of ρ and model parameters so that scholars can know the estimated the ACME when ρ is not equal to 0. Figure 6.3 and Figure 6.4 plot the estimated ACME at $-1 < \rho < 1$ for both outcomes of perceptions of opportunity and perceptions of equality of opportunity separately.

Figure 6.3 presents the results of sensitivity analysis with outcome of perceptions of opportunity. In the control group, the ACME is .49 when $\rho = 0$. Under treatment, the ACME

is .58 when ρ = 0. Under the control condition, the confidence intervals of the ACME containing 0 are within a range of ρ from .35 to .59. Under the treatment circumstance, the confidence intervals of the ACME containing 0 are within a range of ρ from .48 to .65. Thus, the estimated mediation effects for perceptions of opportunity in both treatment and control groups are not sensitive to the violation of the sequential ignorability assumption. The results of the sensitivity analysis underscores the credibility of causal mediation analysis for self-efficacy (mediator) and perceptions of opportunity (outcome). *Hypothesis 4* is supported.

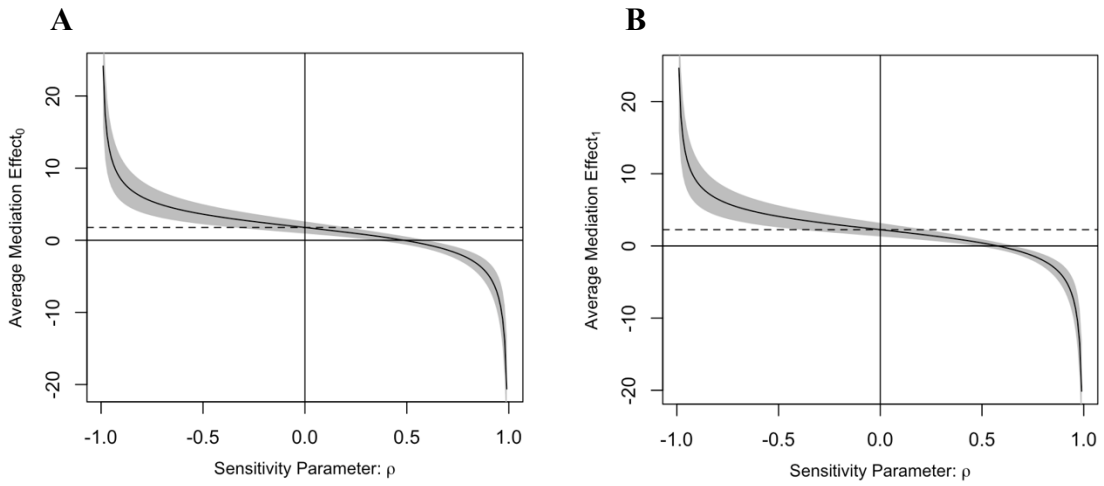

Figure 6.3 Sensitivity Analysis with Self-Efficacy and Perceptions of Opportunity (Total), 2019
Notes: Figure 6.3A shows the estimated average mediation effect in the control group, and Figure 6.3B estimates for the treatment group. The dashed line suggests the estimated mediation effect for ρ = 0. The grey areas are the 95% confidence interval for the estimated mediation effects at each value of ρ. The solid line is the estimated average mediation effect at different values of ρ. (Imai, Keele, and Tingley 2010)

Figure 6.4 shows the results of sensitivity analysis with outcome of perceptions of equality of opportunity. Under the control setting, the ACME is .07 when ρ = 0. Under the treatment state, the ACME is .14 when ρ = 0. Additionally, for the control group, the confidence intervals of the ACME contain 0 when ρ ranges from -.1 to .23. For the treatment group, the confidence intervals of the ACME contain 0 as ρ increasing from -.02 to .30. Thus, the estimated mediation

effects for perceptions of equality of opportunity in both treatment and control groups are considered sensitive to the violation of the sequential ignorability assumption. Thus, *Hypothesis 5* is not supported.

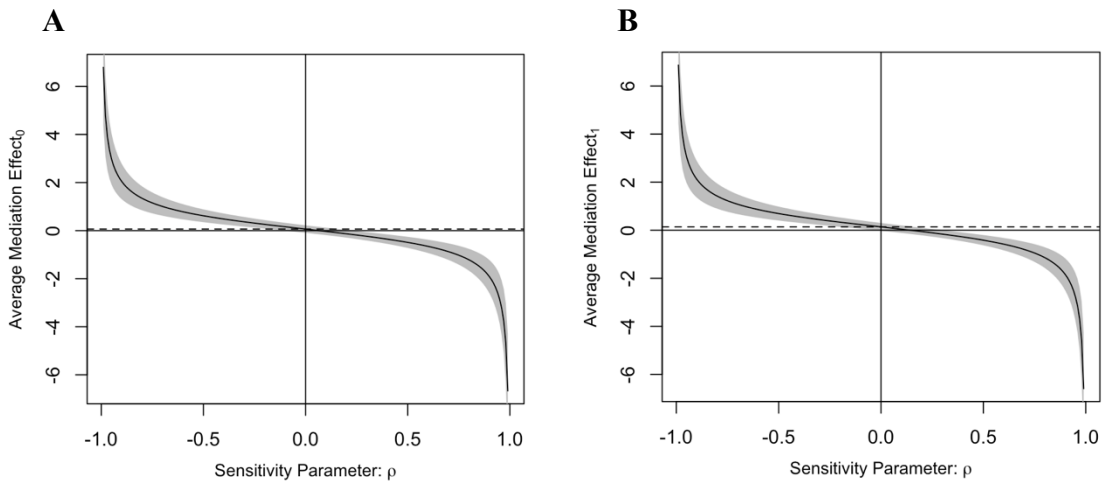

Figure 6.4 Sensitivity Analysis with Self-Efficacy and Perceptions of Equality of Opportunity, 2019

Notes: Figure 6.4A shows the estimated average mediation effect in the control group, and Figure 6.4B estimates for the treatment group. The dashed line suggests the estimated mediation effect for ρ = 0. The grey areas are the 95% confidence interval for the estimated mediation effects at each value of ρ. The solid line is the estimated average mediation effect at different values of ρ. (Imai, Keele, and Tingley 2010)

6.2.3 Causal Mediation Analysis: The Mediator of Emotion

Since I argued that the main source of self-efficacy is the emotions prompted by the physical environment, I tested the emotion variables in the survey experiment. I included five Likert-scale items in the experiment to measure emotions. Figure 6.5 displays the means of positive and negative emotions felt by the respondents in the two groups. Table 6.6 details the Wilcoxon-Mann-Whitney test results for each emotional variables. People who saw the tidy-neighborhood picture reported more positive emotions, such as hopeful ($\bar{X}t$ = 4.5 vs. $\bar{X}c$ = 3.11), safe ($\bar{X}t$ = 4.59 vs. $\bar{X}c$ = 2.84), carefree ($\bar{X}t$ = 4.21 vs. $\bar{X}c$ = 2.95), and powerful ($\bar{X}t$ = 3.8 vs. $\bar{X}c$ = 2.7), while

participants in the untidy group exhibited more depression ($\bar{X}t = 3.8$ vs. $\bar{X}c = 4.91$). The scale variable of emotion (total) indicates positive emotions with a larger value. It is significantly higher in the treatment group than in the control group ($\bar{X}t = 21.3$ vs. $\bar{X}c = 14.7$). All these differences are statistically significant with no overlaps of confidence intervals under the treatment and control conditions in Figure 6.5. Furthermore, results from the Wilcoxon-Mann-Whitney test suggest that the two groups of respondents' emotions are statistically significantly different from each other ($p < .001$; see Table 6.6). Thus, *Hypothesis 6* is supported. A well-maintained built environment stimulates positive emotions, while a poorly-maintained built environment will bring people negative emotional arousals.

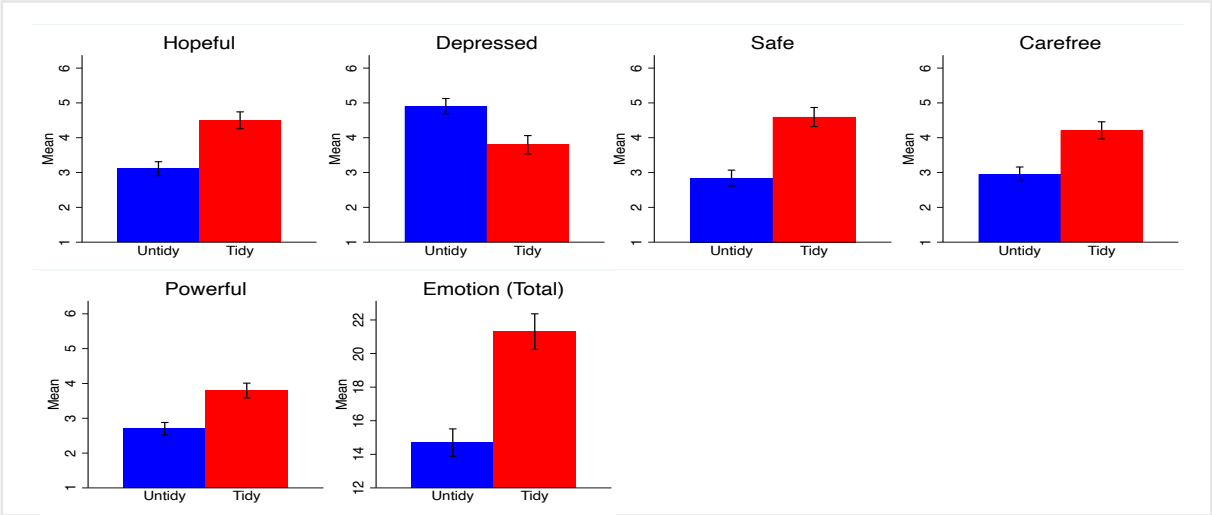

Figure 6.5 Means of Emotions with 95% CI, 2019
Notes: The treatment group is the tidy neighborhood. The control group is the untidy neighborhood.

Table 6.6 Wilcoxon-Mann-Whitney Test of Emotional Variables by Treatment, 2019[14]

Emotions	*z*-Value
Hopeful	-7.91***
Depressed	6.06***
Safe	-8.54***
Carefree	-7.04***
Powerful	-7.30***
Emotion (Total)	-8.56***

Notes: * p < .05 ** p < .01 ***p < .001

To explore whether emotions significantly affect self-efficacy, I conducted the causal mediation analysis with relaxing no-interaction assumption. Table 6.7 suggests that emotional variables played a substantial role in the causation of the built environment and self-efficacy. Without including the interaction variable (column 1), 91% total effects on self-efficacy is from emotions. In the control group (column 3), the percentage of total effects through emotion on self-efficacy is 77%, the number is higher in the treatment group (column 2) and reaches 99%. Therefore, the built environment in neighborhood activated strong emotional arousal among respondents and then affected their self-efficacy. The interaction effect is insignificant (p = .25). The ACME and average total effects are statistically significant with a high proportion of ACME versus average total effects while the average direct effects are insignificant. The results suggest that the treatment in the experiment arouses strong emotional response. Emotions play a critical role in this process and have substantial impacts on self-efficacy. Positive emotions increase levels of self-efficacy and negative emotions hurt self-efficacy. Therefore, *Hypothesis 7* is supported.

[14] Two independent samples *t*-test results please see Table C3 in the Appendix C. The results are similar with Wilcoxon-Mann-Whitney test results.

Table 6.7 Emotion Mediates Built Environment Treatment Effect on Self-efficacy, 2019

	Product of Coefficients		
	Self-Efficacy (Total)		
Average Effect	No Interaction	With Interaction	
		Treatment	Control
Mediation	4.46***	4.93***	3.85***
	[3.34, 5.74]	[3.62, 6.41]	[2.29, 5.61]
Direct	.45	1.08	.01
	[-1.27, 2.22]	[-.89, 2.89]	[-2.02, 1.89]
Total	4.91***	4.93***	
	[3.29, 6.65]	[3.12, 6.63]	
Proportion of Total Effect via Mediation	.91***	.99***	.77***
	[.64, 1.36]	[.69, 1.55]	[.48, 1.22]

Notes: * p < .05 ** p < .01 ***p < .001
The outcome variables is self-efficacy (total). The mediator indicates individuals' emotions (total). Each cell includes a point estimate with its 95% confidence intervals in brackets.

6.2.4 Sensitivity Analysis: The Mediator of Emotion

I also utilized the sensitivity analysis with the interaction item of treatment-emotion to check the sequential ignorability assumptions. Figure 6.6 presents the sensitivity analysis results. In the control group, the ACME is .45 when $\rho = 0$. Under the treatment context, the ACME is .54 when $\rho = 0$. Under the control condition, the confidence intervals of the ACME contain 0 within a range of ρ from .31 to .56. Under the treatment state, the confidence intervals of the ACME contain 0 within a range of ρ from .46 to .61. The estimated mediation effects for self-efficacy via emotions in both treatment and control groups are not likely to violate the sequential ignorability assumptions. The sensitivity analysis underscores the credibility of causal mediation analysis for emotion (mediator) and self-efficacy (outcome). *Hypothesis 7* is supported. Therefore, living in a neighborhood with well-maintained built environment can generate positive emotions among residents and then increase their self-efficacy.

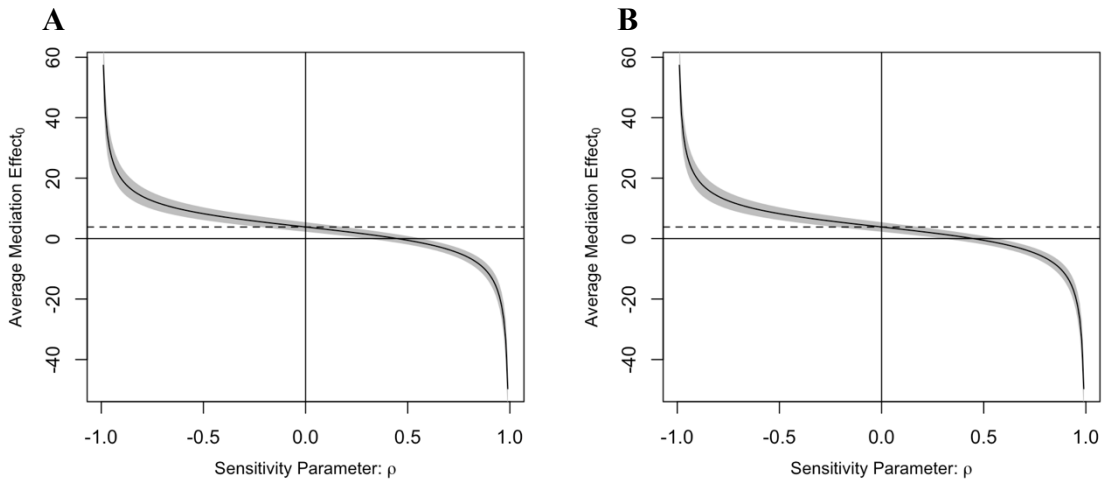

Figure 6.6 Sensitivity Analysis with Emotions and Self-Efficacy, 2019
Notes: Figure 6.6A shows the estimated average mediation effect in the control group, and Figure 6.6B estimates for the treatment group. The dashed line suggests the estimated mediation effect for $\rho = 0$. The grey areas are the 95% confidence interval for the estimated mediation effects at each value of ρ. The solid line is the estimated average mediation effect at different values of ρ. (Imai, Keele, and Tingley 2010)

6.3 Results 3: Subgroup Analysis

Previous research has demonstrated that person inputs and political ideology have impacts on opportunity beliefs (e.g., Lent, Brown, and Hackett 1994; 2000; Newman, Johnston, and Lown 2015; Ladewig 2021; Buscha 2012). Since the dataset is small, to avoid the bias I only ran the analysis for subgroups regarding gender and ideology.

6.3.1 Gender

Figure 6.7 displays the means of opportunities conditioning on gender. Table 6.8 states the Wilcoxon-Mann-Whitney test results for each outcomes by different gender subgroup. According to Figure 6.7 and Table 6.8, the patterns in each gender subgroup did not have distinctive variations. For both male and female, individuals perceived more opportunities ("Opportunity (Total)" in Figure 11) in the treatment group (a well-maintained/tidy

neighborhood) than under the control condition (a badly-maintained/untidy neighborhood) ($\bar{X}tm$ = 18 vs. $\bar{X}cm$ = 13.53, $\bar{X}tf$ = 17.28 vs. $\bar{X}cf$ = 14.84)[15]. The differences are statistical significant based on the Wilcoxon-Mann-Whitney test results in Table 6.8 (the first two rows). *Hypothesis 1* is supported. For perceptions of equality of opportunity, there was no statistical significance found between the treatment and control groups either among males or females ($\bar{X}tm$ = 3.25 vs. $\bar{X}cm$ = 3.19, $\bar{X}tf$ = 3.04 vs. $\bar{X}cf$ = 3.13). The Wilcoxon-Mann-Whitney test results are not significant (the last two rows in Table 6.8). *Hypothesis 2* is not supported.

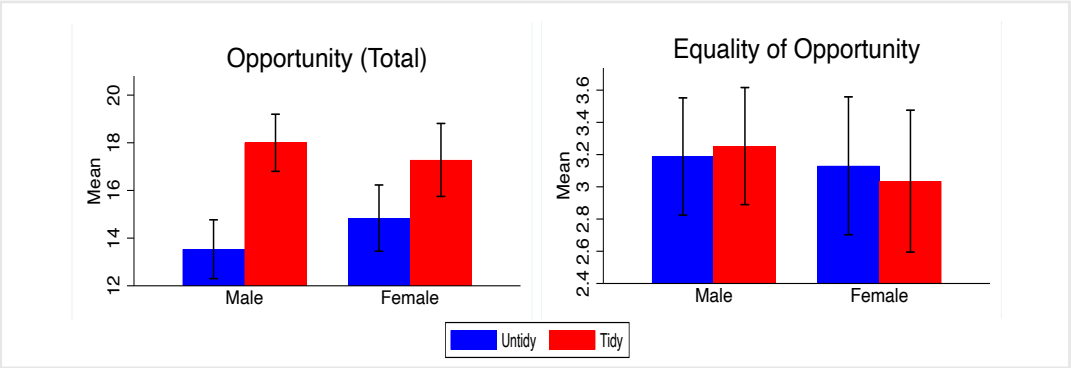

Figure 6.7 Means of Opportunity Beliefs by Gender with 95% CI, 2019
Notes: The treatment group is the tidy neighborhood. The control group is the untidy neighborhood.

[15] $\bar{X}tm$ denotes the sample mean in the treatment group (the tidy neighborhood) for males, $\bar{X}cm$ denotes the sample mean in the control group (the untidy neighborhood) for males. $\bar{X}tf$ denotes the sample mean in the treatment group (the tidy neighborhood) for females, $\bar{X}cf$ denotes the sample mean in the control group (the untidy neighborhood) for females.

Table 6.8 Wilcoxon-Mann-Whitney Test of Opportunity Beliefs by Treatment and Gender, 2019[16]

	z-value
Perceptions of Opportunity (Total)	
Male	-4.90***
Female	-2.57*
Perceptions of Equality of Opportunity	
Male	-.38
Female	.22

Notes: * p < .05 ** p < .01 ***p < .001

6.3.2 Political Ideology

Figure 6.8 demonstrates the means of opportunity beliefs over different political communities. Table 6.9 reports the Wilcoxon-Mann-Whitney test results for each subgroup of political ideology. For perceptions of opportunities ("Opportunity (Total)" in Figure 6.8), both liberals and conservatives ($\bar{X}tl$ = 17.49 vs. $\bar{X}cl$ = 13.62, $\bar{X}tc$ = 19.18 vs. $\bar{X}cc$ = 14.25[17]) perceived significantly more opportunities when they were in the treatment group (a well-maintained/tidy neighborhood) than in the control group (a badly-maintained/untidy neighborhood). *Hypothesis 1* is supported. Yet, for equality of opportunity, no statistical significance existed between treatment and control groups in all three subgroups ($\bar{X}tl$ = 2.47 vs. $\bar{X}cl$ = 2.35, $\bar{X}tmo$ = 3.42 vs. $\bar{X}cmo$ = 4[18], $\bar{X}tc$ = 4.65 vs. $\bar{X}cc$ = 4.30). *Hypothesis 2* is not supported. Besides, liberals were least likely to approve the idea that opportunities are distributed equally in society, compared to

[16] Two independent samples *t*-test results please see Table C4 in the Appendix C. The results are similar with Wilcoxon-Mann-Whitney test results.

[17] $\bar{X}tl$ denotes the sample mean in the treatment group (the tidy neighborhood) for liberals, $\bar{X}cm$ denotes the sample mean in the control group (the untidy neighborhood) for liberals. $\bar{X}tc$ denotes the sample mean in the treatment group (the tidy neighborhood) for conservatives, $\bar{X}cc$ denotes the sample mean in the control group (the untidy neighborhood) for conservatives.

[18] $\bar{X}tmo$ denotes the sample mean in the treatment group (the tidy neighborhood) for moderates, $\bar{X}cmo$ denotes the sample mean in the control group (the untidy neighborhood) for moderates.

people who are moderate or conservative (the bars for liberals are the lowest in "Equality of Opportunity" in Figure 6.8). The result corroborates the findings based on the 2018 CCES data. One possible reason for this finding is that liberals set higher criteria for fairness.

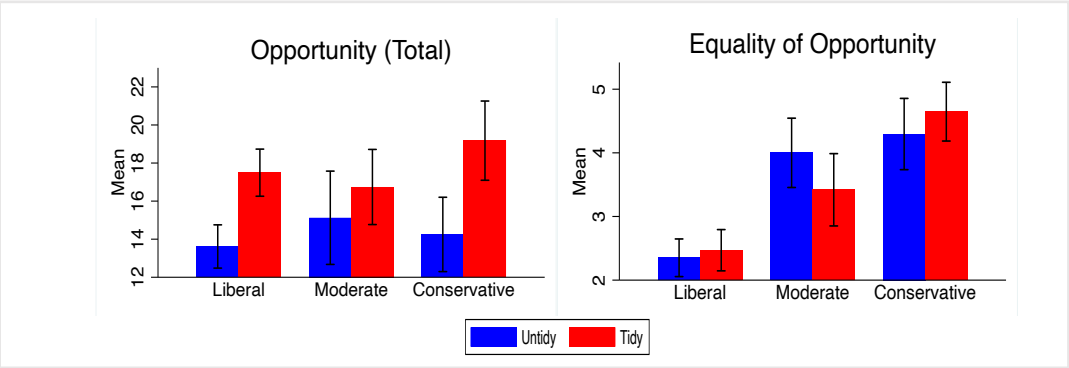

Figure 6.8 Means of Opportunity Beliefs by Ideology with 95% CI, 2019
Notes: The treatment group is the tidy neighborhood. The control group is the untidy neighborhood.

Table 6.9 Wilcoxon-Mann-Whitney Test of Opportunity Beliefs by Treatment and Ideology, 2019[19]

	z-value
Perceptions of Opportunity (Total)	
Liberal	-4.48***
Moderate	-1.00
Conservative	-3.27**
Perceptions of Equality of Opportunity	
Liberal	-.65
Moderate	1.53
Conservative	-.79

Notes: * p < .05 ** p < .01 ***p < .001

[19] Two independent samples *t*-test results please see Table C5 in the Appendix C. The results are similar with Wilcoxon-Mann-Whitney test results.

6.4 Discussion

With the survey experimental data, I tested the causality between the built environment of a neighborhood and opportunity beliefs. *Hypothesis 1* is well supported with the results. People who live in a well-maintained environment tend to perceive more opportunities for their children. However, the treatment does not significantly influence people's opinion towards perceptions of equality of opportunity. With the explorations of mediators, *Hypothesis 2, 3, 5, 6, 7* are all supported. A tidy built environment brings people positive emotions, then a higher-level of self-efficacy, and furthermore, make people perceive more opportunities. However, *Hypothesis 4* is not supported. People with a high-level of self-efficacy do not show significant more agreement with the equality of opportunity. This may be because the contrast between the pictures in the treatment and control groups are not strong enough to alter people's general opinion towards fairness. I have improved this in the 2021 survey experiment.

CHAPTER 7 THE SURVEY EXPERIMENT IN 2021: RESULTS AND DISCUSSION

After excluding the observations with missing data, using less than 3 minutes to finish the survey experiment, or failing to correctly answer the two culture-check questions, the survey experiment in Spring 2021 has 126 respondents in Branch 1 and 142 participants in Branch 2. In this section, I will report the exploration for causality and causal mechanism between the built environment in neighborhood and opportunity beliefs in both branches respectively. Similar to the methods employed for data analysis in 2019 survey experiment, the Wilcoxon-Mann-Whitney test and a general approach of causal mediation analysis have been applied for the 2021 dataset. The descriptive statistics for all variables has been presented in Table 7.1.

Table 7.1 Descriptive Statistics, Survey Experiment in Spring 2021

Variables	Branch 1		Branch 2	
	Treatment	Control	Treatment	Control
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Dependent Variables				
High Income (Self)	3.57 (1.32)	2.88 (1.41)	3.32 (1.21)	2.84 (1.56)
High Social Status (Self)	3.63 (1.46)	2.77 (1.36)	3.24 (1.37)	2.76 (1.46)
Higher Education (Child)	4.18 (1.23)	3.03 (1.38)	3.99 (1.26)	2.94 (1.37)
Higher Income (Child)	3.7 (1.25)	2.74 (1.29)	3.62 (1.21)	2.68 (1.42)
Higher Social Status (Child)	3.67 (1.30)	2.92 (1.45)	3.52 (1.24)	2.87 (1.37)
More Opportunities (Child)	3.9 (1.30)	2.91 (1.48)	3.72 (1.28)	2.81 (1.34)
Perceptions of Opportunity (Total)	22.65 (6.83)	17.26 (7.43)	21.41 (6.38)	16.9 (7.37)
Equality of Opportunity (Self)	3.57 (1.42)	2.67 (1.54)	3.71 (1.18)	2.94 (1.69)
Equality of Opportunity (Society)	3.47 (2.11)	2.92 (1.74)	3.44 (1.91)	3.48 (1.91)
Perceptions of Equality of Opportunity (Total)	7.03 (3.27)	5.59 (2.94)	7.15 (2.65)	--
Primary Independent Variable				
Treatment	1 (0)	0 (0)	1 (0)	0 (0)
Mediator				
Pursuing Goals	3.9 (1.24)	2.86 (1.41)	--	--
Out of Jam	4.3 (1.28)	3.33 (1.46)	--	--

Table 7.1 *Continued*

Variables	Branch 1		Branch 2	
	Treatment	Control	Treatment	Control
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Meeting Goals	4.18 (1.28)	3.11 (1.31)	--	--
Have Aspiration	4.33 (1.31)	3.73 (1.36)	--	--
Insecure about Ability	2.87 (1.46)	4.08 (1.47)	--	--
Give Up Easily	2.6 (1.39)	3.59 (1.62)	--	--
Accept Reality	2.75 (1.48)	3.59 (1.55)	--	--
Self-Efficacy (Total)	29.5 (7.47)	22.77 (8.25)	--	--
Emotional Items				
Hopeful	2.33 (.93)	1.5 (.75)	2.27 (.86)	1.57 (.86)
Depressed	1.67 (.88)	2.82 (.98)	1.7 (.92)	2.7 (1.03)
Safe	2.72 (.83)	1.74 (.86)	2.62 (.74)	1.79 (.92)
Anxious	1.52 (.77)	2.39 (1.02)	1.56 (.88)	2.48 (1.11)
Powerful	1.4 (.67)	1.15 (.40)	1.48 (.73)	1.21 (.54)
Disgust	1.27 (.54)	2.21 (1.03)	1.28 (.62)	2.14 (1.05)
Emotion (Total)	17 (3.41)	11.97 (3.77)	16.94 (3.44)	12.25 (3.99)
Control Variables				
Age	42.1 (12.32)	42.42 (11.08)	43.73 (12.77)	44.29 (12.41)

Table 7.1 *Continued*

Variables	Branch 1		Branch 2	
	Treatment	Control	Treatment	Control
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Female	.47 (.50)	.61 (.49)	.53 (.50)	.54 (.50)
Race [a]	1.25 (.63)	1.36 (.78)	1.37 (.74)	1.17 (.55)
Married	.52 (.50)	.42 (.50)	.52 (.50)	.60 (.49)
Having children	.32 (.47)	.27 (.45)	.37 (.49)	.43 (.50)
Employed	.87 (.34)	.83 (.38)	.75 (.44)	.73 (.45)
Family income [b]	1.87 (.72)	1.94 (.74)	1.91 (.66)	1.86 (.69)
Living Area [c]	2 (.61)	2.18 (.63)	2.04 (.56)	2.08 (.79)
Political Ideology [d]	1.75 (.88)	1.83 (.90)	1.85 (.89)	1.73 (.83)
Party [e]	1.7 (.89)	1.77 (.92)	1.81 (.91)	1.62 (.89)
Number of Observations	60	66	79	63

Notes:
[a] Race has three categories, white is coded as 1, black is coded as 2, and other race is coded as 3.
[b] Family income has three categories, low income is coded as 1, middle income is coded as 2, and high income is coded as 3.
[c] Living area has three categories, urban is coded as 1, suburban is coded as 2, and rural is coded as 3.
[d] Political ideology has three categories, liberal is coded as 1, moderate is coded as 2, and conservative is coded as 3.
[e] Party has three categories, democrat is coded as 1, independent is coded as 2, and republican is coded as 3.

7.1 Results 1: Opportunity Beliefs

Table 7.2 reports the *z*-score from the Wilcoxon-Mann-Whitney test for all opportunity beliefs variables. Figure 7.1 presents the means of participants' perceptions of opportunity in both

Branch 1 and Branch 2 with the 95% confidence intervals. Figure 7.2 displays the means of perceptions of equality of opportunity for Branch 1 and Branch 2 with 95% confidence intervals. The results of perceptions of opportunity for both branches are similar. There are barely intervals overlaps for measures of perceptions of opportunity. Expectations for income (self) ($\bar{X}t_1$ = 3.57 vs. $\bar{X}c_1$ = 2.88, $\bar{X}t_2$ = 3.32 vs. $\bar{X}c_2$ = 2.84)[20], social status (self) ($\bar{X}t_1$ = 3.63 vs. $\bar{X}c_1$ = 2.77, $\bar{X}t_2$ = 3.24 vs. $\bar{X}c_2$ = 2.76), education for children ($\bar{X}t_1$ = 4.18 vs. $\bar{X}c_1$ = 3.03, $\bar{X}t_2$ = 3.99 vs. $\bar{X}c_2$ = 2.94), income for children ($\bar{X}t_1$ = 3.7 vs. $\bar{X}c_1$ = 2.74, $\bar{X}t_2$ = 3.62 vs. $\bar{X}c_2$ = 2.68), social status for children ($\bar{X}t_1$ = 3.67 vs. $\bar{X}c_1$ = 2.92, $\bar{X}t_2$ = 3.52 vs. $\bar{X}c_2$ = 2.87), opportunities for children ($\bar{X}t_1$ = 3.9 vs. $\bar{X}c_1$ = 2.91, $\bar{X}t_2$ = 3.72 vs. $\bar{X}c_2$ = 2.81) and the scale variable of perceptions of opportunity (total) ($\bar{X}t_1$ = 22.65 vs. $\bar{X}c_1$ = 17.26, $\bar{X}t_2$ = 21.41 vs. $\bar{X}c_2$ = 16.9) are significantly higher in the treatment group than in the control group in both branches. The difference is the p-values for expectations for income and social status for respondents themselves are lower in the Branch 1 ($p < .01$) than them in the Branch 2 ($p < .05$) (row 1 and row 2 in Table 7.2). According to the results from Figure 7.1 and the Wilcoxon-Mann-Whitney test (Table 7.2), participants in the treatment group (the well-maintained neighboorhood) in both branches perceived significantly more opportunities for themselves and their children than respondents in the control group (the badly-maintained neighborhood). *Hypothesis 1* is supported in both Branch 1 and Branch 2.

[20] $\bar{X}t_1$ denotes the sample mean in the treatment group (the tidy neighborhood) in Branch 1. $\bar{X}c_1$ denotes the sample mean in the control group (the untidy neighborhood) in Branch 1. $\bar{X}t_2$ denotes the sample mean in the treatment group (the tidy neighborhood) in Branch 2. $\bar{X}c_2$ denotes the sample mean in the control group (the untidy neighborhood) in Branch 2.

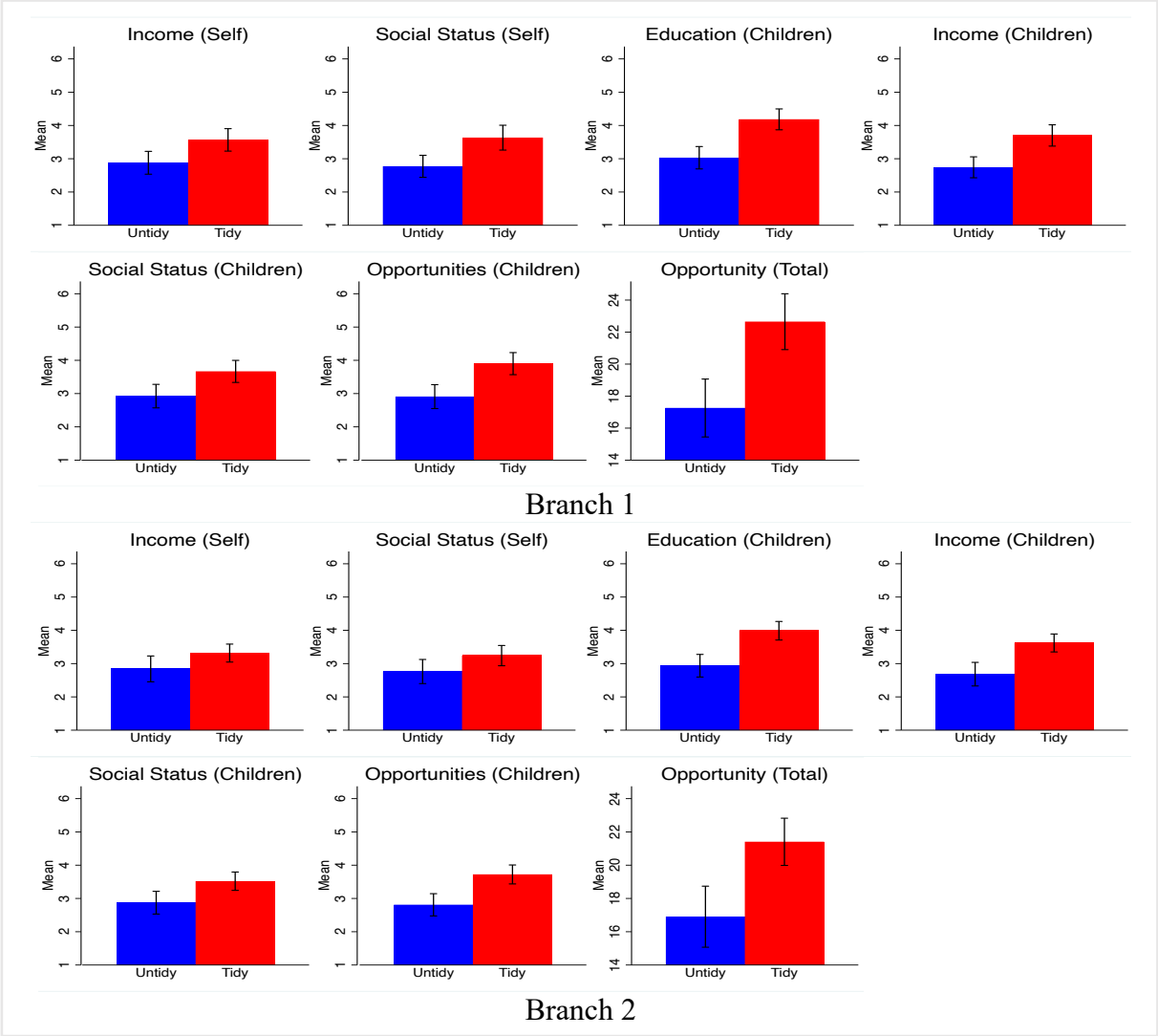

Figure 7.1 Means of Perceptions of Opportunity with 95% CI, 2021
Notes: The treatment group is the tidy neighborhood. The control group is the untidy neighborhood.

For perceptions of equality of opportunity, in both branches, respondents who saw the pictures of a tidy neighborhood were more likely to consider that they had equal opportunities for getting ahead in life like everyone else ("Equality of Opp. (Self)" in Figure 7.2, $\bar{X}t_1 = 3.57$ vs. $\bar{X}c_1 = 2.67$, $\bar{X}t_2 = 3.71$ vs. $\bar{X}c_2 = 2.94$), compared to people who were shown with an untidy neighborhood. Again, like the results from the survey experiment in 2019, when asking if respondents agreed/disagreed that nowadyas in the United States, everyone has equal

opportunites for getting ahead in life ("Equality of Opp. (Society)" in Figure 7.2, $\bar{X}t_1 = 3.47$ vs. $\bar{X}c_1 = 2.92$, $\bar{X}t_2 = 3.44$ vs. $\bar{X}c_2 = 3.48$), no significant differentiation has been found between the treatment and control groups in both branches. In Branch 1, the difference of two means of the total indicator of perceptions of equality of opportunity ("Equality of Opp. (Total)" in Figure 7.2, $\bar{X}t_1 = 7.03$ vs. $\bar{X}c_1 = 5.59$) has statistical significance. Thus, the results in Branch 1 show more support for *Hypothesis 2*. Respondents who saw a tidy neighborhood were more likely to agree that the opportunities are equally distributed, especially considering themselves having equal opportunities like everyone else.

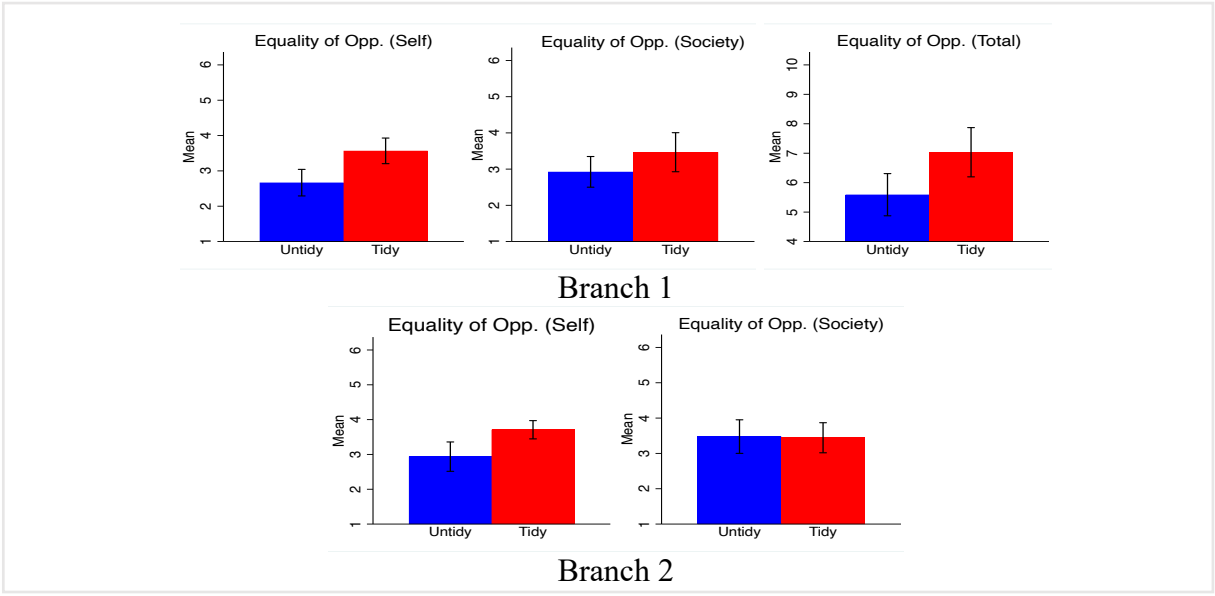

Figure 7.2 Means of Perceptions of Equality of Opportunity with 95% CI, 2021
Notes: The treatment group is the tidy neighborhood. The control group is the untidy neighborhood.

Table 7.2 Wilcoxon-Mann-Whitney Test of Opportunity Beliefs by Treatment, 2021[21]

Opportunity Beliefs	Branch 1	Branch 2
Expect higher income for themselves	-2.75**	-2.13*
Expect higher social status for themselves	-3.18**	-2.07*
Expect higher education for children	-4.54***	-4.44***
Expect higher income for children	-4.13***	-3.92***
Expect higher social status for children	-3.03**	-2.76**
Expect more opportunities for children	-3.81***	-3.94***
Perceptions of Opportunity (Total)	-4.01***	-3.55***
I have equal opportunities like everyone else	-3.47***	-2.99**
Everyone has equal opportunities in the society	-1.33	.05
Perceptions of Equal Opportunity (Total)	-2.41*	--

Notes: * p < .05 ** p < .01 ***p < .001

According to the results, the built environment of neighborhoods has deeper impacts on residents' perceptions of opportunity, but it affects people's perceptions of equality of opportunity in a limited way. General beliefs about fairness in society are different from perceptions about fairness for the self. People who imagined living in a well-maintained neighborhood are more likely to believe that they have equal opportunities compared to everyone else. However, the built environment in neighborhoods does not change people's general opinion towards the distributions of opportunities in the society. When people evaluate information about themselves, they are more likely to be affected by their environments. Previous research has demonstrated that compared to the general belief, the endorsement of the personal belief in a just world has a stronger positive correlation with positive moods (Dalbert 1999) and positive self-presentations (Alves and Correia 2010b). In the 2021 survey experiment, a decent neighborhood environment brought respondents positive attitudes about themselves. Respondents' perceptions

[21] Two independent samples *t*-test results please see Table C6 in the Appendix C. The results are similar with Wilcoxon-Mann-Whitney test results.

of equal opportunity for themselves significantly increased when they had the positive emotional arousals. In contrast, the built environment and emotional arousals did not have significant impacts on respondents' general beliefs of equal opportunity. Additionally, the differences between Branch 1 and Branch 2 are not noticeable. Therefore, involving self-efficacy variables in Branch 1 did not contaminate the impact of the treatement on outcomes. I will explore the mediation effects from self-efficacy in Branch 1 rigorously in section 7.2 Results 2.

7.2 Results 2: Mediators

According to the Opportunity Beliefs Theory, the built environment in people's living area affect the residents' opportunity beliefs through affecting their self-efficacy. To explore the causal mechanism between the built environment in neighborhoods and opportunity beliefs, self-efficacy variables were involved in the survey experiment as mediators. I argue that emotions are the main source for self-efficacy in this case, so I incorporated emotional variables in the survey experiment and will explore the impacts of treatment on self-efficacy via emotions in this section.

7.2.1 Causal Mediation Analysis: The Mediator of Self-Efficacy

First, I compared the means of all self-efficacy variables for people from the treatment and control groups with the data of Branch 1 (Figure 7.3). Checked by the Wilcoxon-Mann-Whitney test, there exist statistically significant differences between the two groups for all items of self-efficacy (Table 7.3). Giving the Opportunity Beliefs Theory, if people are living in a well-maintained neighborhood, they are more likely to experience positive emotions, then positive emotions can stimulate a higher evaluation of self-efficacy. In contrast, a poorly-maintained

neighborhood is more likely to deliver negative emotional messages to residents, and negative emotions can harm their self-efficacy. Based on the results in Figure 7.3, participants in the treatment group (a well-maintained neighborhood) have significantly higher levels of self-efficacy, compared to people in the control group (a badly-maintained neighborhood). Participants from the treatment group expressed that (1) they can energetically pursue their goals ($\bar{X}t_1$ = 3.9 vs. $\bar{X}c_1$ = 2.86), (2) if they find themselves in a jam, they can think of many ways to get out of it ($\bar{X}t_1$ = 4.3 vs. $\bar{X}c_1$ = 3.33), (3) they can meet their goals that they have set for themselves ($\bar{X}t_1$ = 4.18 vs. $\bar{X}c_1$ = 3.11), and (4) they believe that it is better to have aspirations for they family than to accept each day as it comes ($\bar{X}t_1$ = 4.33 vs. $\bar{X}c_1$ = 3.73). They are also less likely to (5) feel insecure about their ability to do things ($\bar{X}t_1$ = 2.87 vs. $\bar{X}c_1$ = 4.08), (6) give up easily ($\bar{X}t_1$ = 2.6 vs. $\bar{X}c_1$ = 3.59), or (7) believe that it is better to learn to accept the reality of things than to dream for a better future ($\bar{X}t_1$ = 2.7 vs. $\bar{X}c_1$ = 3.59). The scale variable of self-efficacy (total) ($\bar{X}t_1$ = 29.5 vs. $\bar{X}c_1$ = 22.77) is also significantly higher in the treatment group than under the control condition. These differences of means are all statistically significant according to Table 7.3. Therefore, *Hypothesis 3* is supported. Controlling for people's socioeconomic status, people who live in a neighborhood with better-maintained built environment, will have a higher-level of self-efficacy.

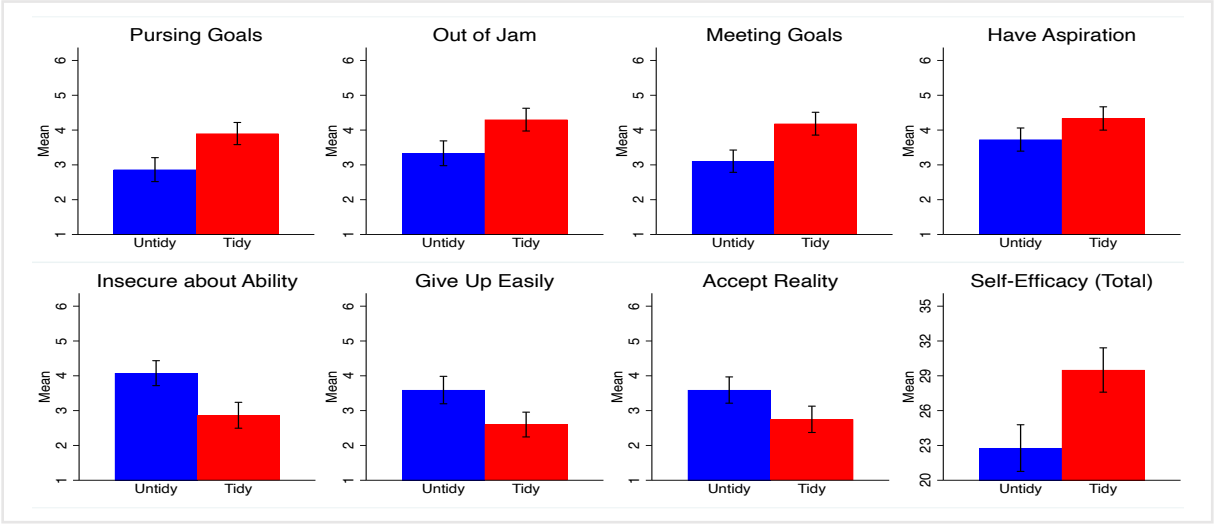

Figure 7.3 Means of Self-efficacy in Branch 1 with 95% CI, 2021
Notes: The treatment group is the tidy neighborhood. The control group is the untidy neighborhood.

Table 7.3 Wilcoxon-Mann-Whitney Test of Self-Efficacy by Treatment, Branch 1, 2021[22]

Self-Efficacy	*z*-Value
Pursuing Goals	-4.18***
Out of Jam	-3.74***
Meeting Goals	-4.32***
Have Aspiration	-2.49*
Insecure about Ability	4.35***
Give Up Easily	3.61***
Accept Reality	3.00**
Self-Efficacy (Total)	-4.43***

Notes: * p < .05 ** p < .01 ***p < .001

To understand if the self-efficacy significantly affects respondents' opportunity beliefs, I conducted the causal mediation analysis to detect the proportions of impacts on the outcomes from the treatment and mediators. The same as the survey experiment in 2019, all control

[22] Two independent samples *t*-test results please see Table C7 in the Appendix C. The results are similar with Wilcoxon-Mann-Whitney test results.

variables, including age, gender, race, marital status, whether having children under 18, education, employment status, family income, living area, political ideology, and party identity, have been incorporated in the causal mediation analysis for 2021 survey experimental data to increase the credibility of sequential ignorability. The no-interaction assumption was also relaxed here in order to examine the ACME in each different treatment status. In addition, I conducted the sensitivity analysis to test if the assumptions of sequential ignorability are satisfied.

For perceptions of opportunity, Table 7.4 demonstrates that the mediator substantially affects the outcomes, and the direct effects do not have significant effect on the outcomes. For the model without interaction, 66% total effects are from mediation effects. The ACME and total effects are statistically significant. When the treatment-mediator interaction was added into the model, 77% total effects are from mediation effects under the control group, while only 48% total effects come from mediation effects under the treatment group. The mediator plays a larger role in the control group. The difference between the treatment and control groups are larger, compared to data of 2019 survey experiments (58% in the treatment group vs. 45% under the control condition). This larger gap of proportions between the treatment and groups in 2021 may be because adding more pictures of the neighborhood and pictures of the neighborhood in control group depicting a worse-maintained neighborhood than the pictured included in the 2019 survey experiment. A worse-maintained environment provoked stronger negative feelings for the respondents. I also tested if the treatment-mediator interaction is statistically meaningful. It is not statistically significant given that $p = .29$. No matter with or without the interaction, a high proportion of impacts on the perceptions of opportunity is from the mediator. *Hypothesis 4* is supported.

Table 7.4 Self-Efficacy Mediates Built Environment Treatment Effect on Perceptions of Opportunity, 2021

	Product of Coefficients		
	Perceptions of Opportunity (Total)		
Average Effect	No Interaction	With Interaction	
		Treatment	Control
Mediation	3.43***	2.55*	4.07***
	[1.52, 6.07]	[.03, 5.80]	[1.97, 6.26]
Direct	1.79	1.26	2.78
	[-1.18, 4.37]	[-1.02, 3.95]	[-.73, 7.16]
Total	5.22***	5.33***	
	[2.74, 7.64]	[2.68, 8.22]	
Proportion of Total Effect via Mediation	.66***	.48*	.77***
	[.31, 1.37]	[.004, 1.18]	[.41, 1.29]

Notes: * p < .05 ** p < .01 ***p < .001

1. The outcome variables is perceptions of opportunity (total). The mediator indicates individuals' self-efficacy (total). Each cell includes a point estimate with its 95% confidence intervals in brackets.

2. Party identity is not included in the linear regression model without interaction for estimating the self-efficacy mediation effects on perceptions of opportunity because of the problem of overfitting. The results of including the variable of party identity (no interaction) are similar: Mediation Effect = 3.49***, Direct Effect = 1.84, Total Effect = 5.33***, Proportion of Total Effect via Mediation = .66***.

Table 7.5 presents the mediation effects on perceptions of equality of opportunity. For the model without the interaction of treatment and mediation, the proportion of total effect via mediation is 61%. After adding the treatment-mediation interaction, the proportion of total effect via mediation is 66% in control group, higher than 51% in the treatment group. The statistical significance only exists in the control group. Also, the treatment-mediator interaction is not significant (p = .64). *Hypothesis 5* is supported in Branch 1. Residents living in a tidy neighborhood hold a higher level of self-efficacy, and are more likely to approve the perceptions of equality of opportunity. Therefore, Table 7.4 and Table 7.5 demonstrate that the built environment in a neighborhood influences the formation of residents' self-efficacy, then their

self-efficacy will affect their perceptions of opportunity and perceptions of equality of opportunity. The Opportunity Beliefs Theory is well supported.

Table 7.5 Self-Efficacy Mediates Built Environment Treatment Effect on Perceptions of Equality of Opportunity, 2021

	Product of Coefficients		
	Perceptions of Equality of Opportunity (Total)		
Average Effect	No Interaction	With Interaction	
		Treatment	Control
Mediation	.95***	.80	1.03***
	[.41, 1.69]	[-.22, 1.93]	[.42, 1.83]
Direct	.61	.51	.75
	[-.49, 1.60]	[-.71, 1.80]	[-.74, 2.36]
Total	1.56***	1.55**	
	[.60, 2.46]	[.46, 2.62]	
Proportion of Total Effect via Mediation	.61***	.51	.66**
	[.27, 1.63]	[-.15, 2.13]	[.25, 2.06]

Notes: * p < .05 ** p < .01 ***p < .001
The outcome variables is perceptions of equality of opportunity (total). The mediator indicates individuals' self-efficacy (total). Each cell includes a point estimate with its 95% confidence intervals in brackets.

7.2.2 Sensitivity Analysis: The Mediator of Self-Efficacy

I also conducted the sensitivity analysis for both outcome variables under the treatment or control conditions respectively (Figure 7.4 and Figure 7.5). Figure 7.4 displays the sensitivity analysis results for the outcome of perceptions of opportunity. The ACME is .68 when $\rho = 0$, under the control condition. The ACME is .51 when $\rho = 0$, in the treatment group. In the control group, the confidence intervals of the ACME covering 0 are related to a range of ρ from .59 to .74. Under the treatment circumstance, the confidence intervals of the ACME across 0 covers a range of ρ from .12 to .73. Thus, the estimated mediation effects for perceptions of opportunity in control group are not sensitive to the violation of the sequential ignorability assumption. The

treatment group is more sensitive to violate the sequential ignorability assumption compared to the control group. The results of sensitivity underscores the credibility of causal mediation analysis for self-efficacy and perceptions of opportunity strongly in the control group. *Hypothesis 4* is still supported.

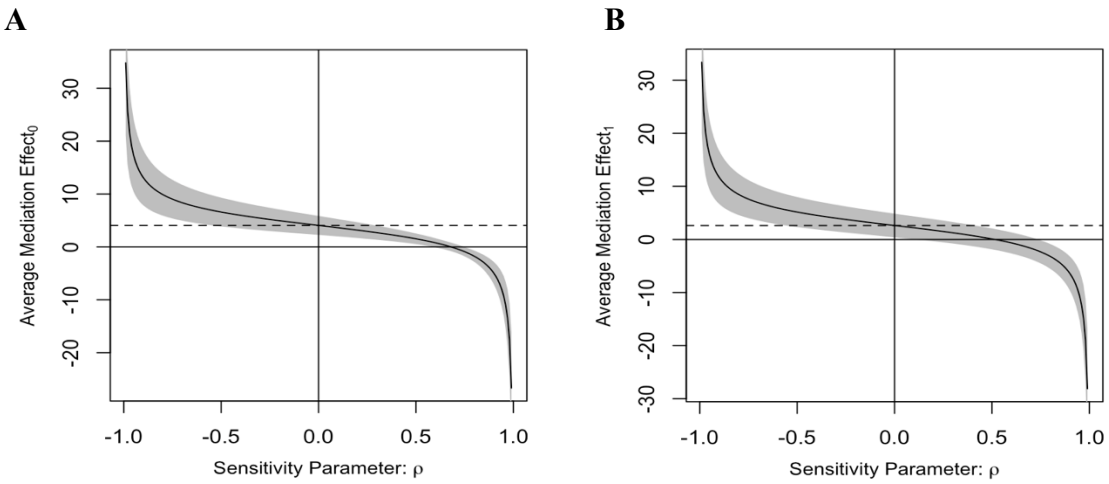

Figure 7.4 Sensitivity Analysis with Self-Efficacy and Perceptions of Opportunity (Total), 2021

Notes: Figure 7.4A shows the estimated average mediation effect in the control group, and Figure 7.4B estimates for the treatment group. The dashed line suggests the estimated mediation effect for ρ = 0. The grey areas are the 95% confidence interval for the estimated mediation effects at each value of ρ. The solid line is the estimated average mediation effect at different values of ρ. (Imai, Keele, and Tingley 2010)

Figure 7.5 demonstrates the results of sensitivity analysis for the outcome of perceptions of equality of opportunity. In the control group, the ACME is .46 at ρ = 0. In the treatment group, the ACME is .37 at ρ = 0. In the control group, the sequential ignorability assumption is fairly met. The confidence intervals of the ACME covering 0 appear with a range of ρ from .29 to .59. However, under the treatment condition, the confidence intervals of the ACME across 0 covers a range of ρ from -.01 to .63. The departure of ρ = 0 is really small then the ACME may equal to 0. Thus, the estimated mediation effects for perceptions of opportunity in the treatment group are

sensitive to the violation of the sequential ignorability assumption. *Hypothesis 5* is partially supported by the control group data.

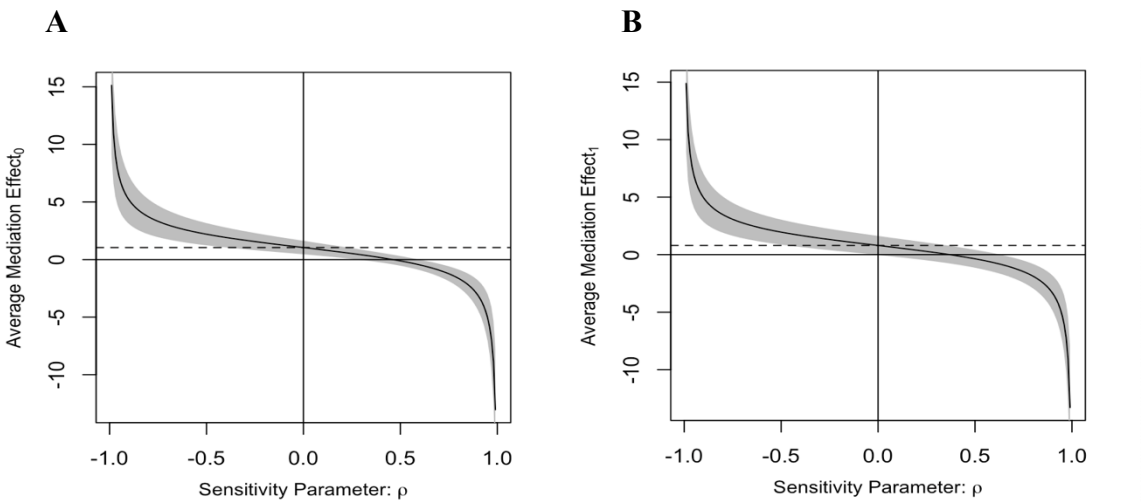

Figure 7.5 Sensitivity Analysis with Self-Efficacy and Perceptions of Equality of Opportunity (Total), 2021

Notes: Figure 7.5A shows the estimated average mediation effect in the control group, and Figure 7.5B estimates for the treatment group. The dashed line suggests the estimated mediation effect for ρ = 0. The grey areas are the 95% confidence interval for the estimated mediation effects at each value of ρ. The solid line is the estimated average mediation effect at different values of ρ. (Imai, Keele, and Tingley 2010)

7.2.3 Causal Mediation Analysis: The Mediator of Emotion

Figure 7.6 displays the means of emotions in the treatment group and control group respectively with the 95% confidence interval for Branch 1 and Branch 2. Table 7.6 reports the Wilcoxon-Mann-Whitney test results for each emotion and the aggregated variable of emotions. Both branches emerge same pattern. Participants in the treatment groups (a well-maintained neighborhood) significantly feel more positive emotions, such as hopeful ($\bar{X}t_1$ = 2.33 vs. $\bar{X}c_1$ = 1.5, $\bar{X}t_2$ = 2.27 vs. $\bar{X}c_2$ = 1.57), safe ($\bar{X}t_1$ = 2.72 vs. $\bar{X}c_1$ = 1.74, $\bar{X}t_2$ = 2.62 vs. $\bar{X}c_2$ = 1.79), or powerful ($\bar{X}t_1$ = 1.4 vs. $\bar{X}c_1$ = 1.15, $\bar{X}t_2$ = 1.48 vs. $\bar{X}c_2$ = 1.21), and less negative emotions, like depressed ($\bar{X}t_1$ = 1.67 vs. $\bar{X}c_1$ = 2.82, $\bar{X}t_2$ = 1.7 vs. $\bar{X}c_2$ = 2.7), anxious ($\bar{X}t_1$ = 1.52 vs. $\bar{X}c_1$ = 2.39,

$\bar{X}t_2 = 1.56$ vs. $\bar{X}c_2 = 2.48$), or disgusted ($\bar{X}t_1 = 1.27$ vs. $\bar{X}c_1 = 2.21$, $\bar{X}t_2 = 1.28$ vs. $\bar{X}c_2 = 2.14$), compared to their fellows in the control groups (a badly-maintained neighborhood). The means of the scale variable of emotion (total) ($\bar{X}t_1 = 17$ vs. $\bar{X}c_1 = 11.97$, $\bar{X}t_2 = 16.94$ vs. $\bar{X}c_2 = 12.25$) are significant higher in the treatment group than in the control condition. All of these differences of means in both branches are statistically significant according to Table 7.6. *Hypothesis 6* is supported. A well-maintained built environment generates positive emotions while a poorly-maintained built environment produces negative emotions.

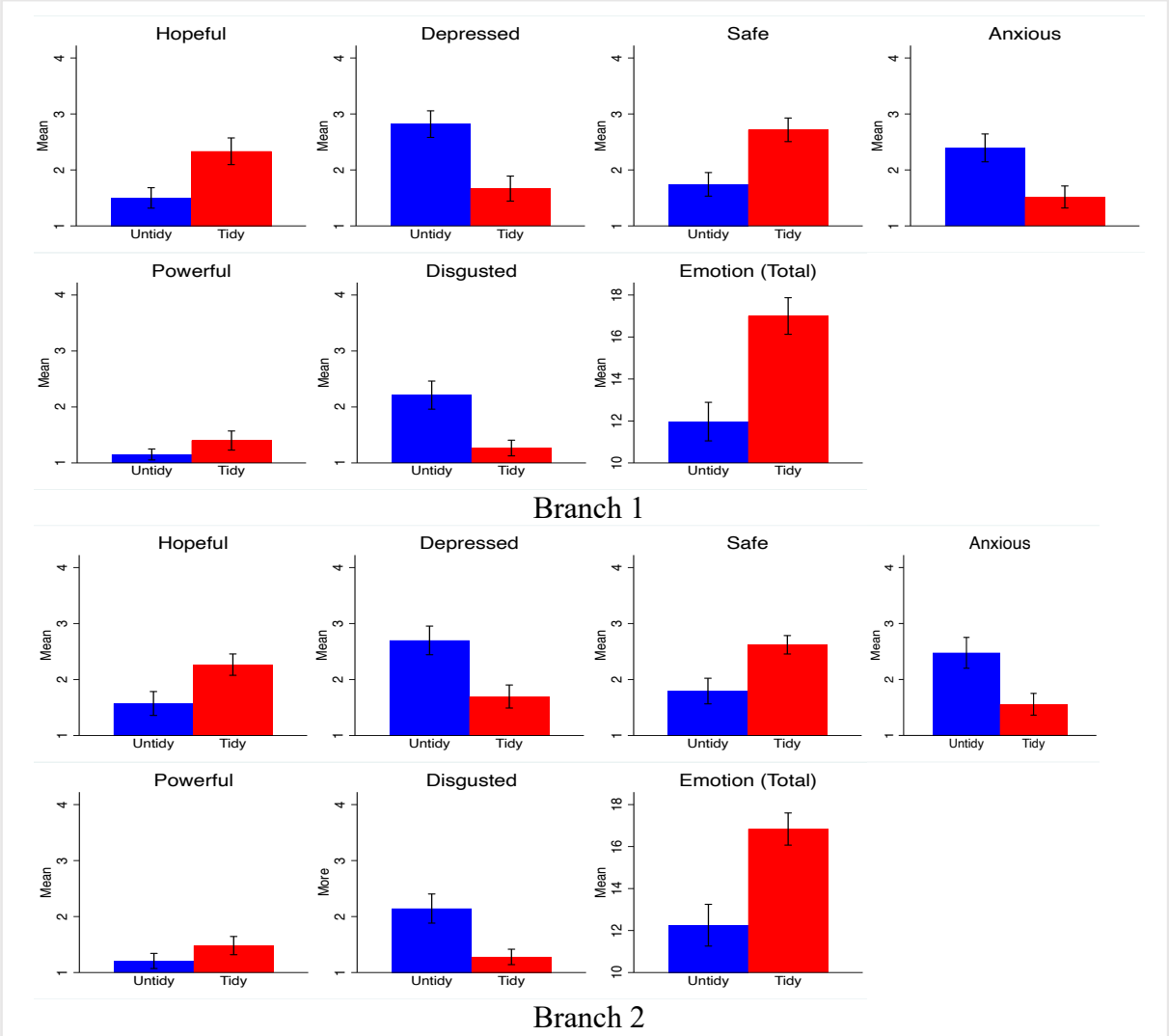

Figure 7.6 Means of Emotions with 95% CI, 2021

Notes: The treatment group is the tidy neighborhood. The control group is the untidy neighborhood.

Table 7.6 Wilcoxon-Mann-Whitney Test of Emotions by Treatment, 202123

Emotions	Branch 1	Branch 2
Hopeful	-5.25***	-4.79***
Depressed	5.99***	5.53***
Safe	-5.73***	-5.39***
Anxious	4.91***	5.15***
Powerful	-2.47*	-2.75**
Disgust	5.59***	5.72***
Emotion (Total)	-6.45***	-6.23***

Notes: * p < .05 ** p < .01 ***p < .001

7.2.4 Sensitivity Analysis: The Mediator of Emotion

I also conducted the causal mediation analysis while relaxing the no-interaction assumption to explore the emotions' impact between the built environment and self-efficacy with Branch 1 data. According to Table 7.7, in the control group, 87% of the impacts on self-efficacy is through emotional variables. The ACME, average direct effects, and total effects with interaction term of treatment-emotion are statistical meaningful for control group. In contrast, 25% proportion of total effects on self-efficacy is from emotions for the treatment group, and the statistical significance does not exist. The interaction effect of treatment-emotion is statistically significant (p = .05). Thus, the treatment has more influences on respondents' self-efficacy in the control group than people in the treatment group. Moreover, respondents in the control group formed stronger emotional reactions towards the built environment compared to respondents in the treatment group. This may due to the pictures in the control groups depict an exceedingly adverse built environment and arouse deeper emotional reactions among the respondents. Then,

[23] Two independent samples *t*-test results please see Table C8 in the Appendix C. The results are similar with Wilcoxon-Mann-Whitney test results.

the self-efficacy levels of respondents in the control group were largely affected by their emotional arousals. *Hypothesis 7* is partially supported by the control group.

Table 7.7 Emotion Mediates Built Environment Treatment Effect on Self-efficacy, 2021

	Product of Coefficients		
	Self-Efficacy (Total)		
Average Effect	No Interaction	With Interaction	
		Treatment	Control
Mediation	3.84**	1.56	5.38**
	[1.26, 6.81]	[-1.71, 5.16]	[2.17, 9.37]
Direct	2.39	.79	4.62*
	[-1.04, 5.93]	[-3.11]	[.38, 9.08]
Total	6.23***	6.18***	
	[3.23, 9.38]	[2.96, 9.65]	
Proportion of Total Effect via Mediation	.61**	.25	.87**
	[.21, 1.25]	[-.33, .92]	[.39, 1.68]

Notes: * p < .05 ** p < .01 ***p < .001
The outcome variables is self-efficacy (total). The mediator indicates individuals' emotions (total). Each cell includes a point estimate with its 95% confidence intervals in brackets.

Next, I ran a sensitivity analysis with the interaction item of treatment-emotion with Branch 1 data. Figure 7.7 shows the sensitivity analysis results. In the control group, the ACME is .51 at ρ = 0. Under the treatment state, ACME is only .17 when ρ = 0. For the control group, the confidence intervals of the ACME containing 0 correspond to a range of ρ from .31 to .65. The estimated mediation effects for self-efficacy via emotions in the control group are not sensitive to violate the sequential ignorability assumption. However, under the treatment setting, the confidence intervals of the ACME contain 0 within a range of ρ from -.12 to .42. The estimated mediation effects for self-efficacy via emotions in the treatment group should violate the sequential ignorability assumption. *Hypothesis 7* is supported by the control group data. Therefore, for respondents under the control state, living in a neighborhood with badly-

maintained built environment can generate negative emotions among residents and decrease their self-efficacy. Like I explained before, this is probably because the pictures in the control group made respondents exposed to a really unfavorable environment and aroused their strong negative emotions.

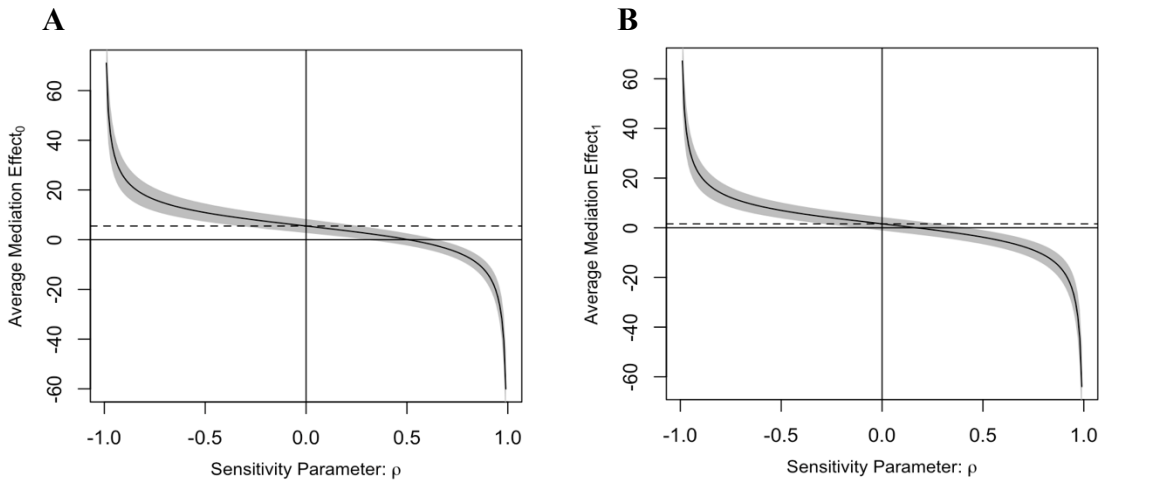

Figure 7.7 Sensitivity Analysis with Emotions and Self-Efficacy, 2021
Notes: Figure 7.7A shows the estimated average mediation effect in the control group, and Figure 7.7B estimates for the treatment group. The dashed line suggests the estimated mediation effect for $\rho = 0$. The grey areas are the 95% confidence interval for the estimated mediation effects at each value of ρ. The solid line is the estimated average mediation effect at different values of ρ. (Imai, Keele, and Tingley 2010)

7.3 Results 3: Subgroup Analysis

7.3.1 Gender

This section explores whether and how the built environment affects opportunity beliefs depending on gender or political ideology. Figure 7.8 presents the means of outcome variables for each gender group. Table 7.8 reports the Wilcoxon-Mann-Whitney test results for each gender subgroup. In Branch 1, the built environment in neighborhoods only statistically significantly affects females' opportunity beliefs. Female respondents were more likely to

perceive more opportunities ("Opportunity (Total)" in Branch 1, Figure 7.8, $\bar{X}t_1f = 22.32$ vs. $\bar{X}c_1f = 15.78$[24]) and believed that everyone has equal opportunity ("Equality of Opportunity (Self)" in Branch 1, $\bar{X}t_1f = 3.68$ vs. $\bar{X}c_1f = 2.58$, and "Equality of Opportunity (Total)" in Branch 1, $\bar{X}t_1f = 7.25$ vs. $\bar{X}c_1f = 5.45$, Figure 7.8) when they were assigned into the treatment group (a tidy neighborhood), compared to other females who were in the control group (an untidy neighborhood). However, in Branch 2, males in the treatment group perceived more opportunities than males from the control group ("Opportunity (Total)" in Branch 2, Figure 7.8, $\bar{X}t_2m = 22.27$ vs. $\bar{X}c_2m = 15.93$[25]). Also, males in the treatment group of Branch 2 were more likely to agree that they have equal opportunities like everyone else ("Equality of Opportunity (Self)" in Branch 2, Figure 7.8, $\bar{X}t_2m = 2.03$ vs. $\bar{X}c_2m = 1.65$). The "Equality of Opportunity (Society)" does not have statistical significance in both branches according the Wilcoxon-Mann-Whitney test results ($\bar{X}t_1m = 3.38$ vs. $\bar{X}c_1m = 3$, $\bar{X}t_1f = 3.57$ vs. $\bar{X}c_1f = 2.88$, $\bar{X}t_2m = 18$ vs. $\bar{X}c_2m = 3.46$, $\bar{X}t_2f = 3.43$ vs. $\bar{X}c_2f = 3.32$). Though the subgroup effects of gender are mixed, the results support *Hypothesis 1* and partially support *Hypothesis 2*. Generally, people living in a better-maintained neighborhood are more likely to perceive more opportunities and to agree that opportunities are distributed equally in society.

[24] $\bar{X}t_1m$ denotes the sample mean in the treatment group (the tidy neighborhood) for males in Branch 1, $\bar{X}c_1m$ denotes the sample mean in the control group (the untidy neighborhood) for males in Branch 1. $\bar{X}t_1f$ denotes the sample mean in the treatment group (the tidy neighborhood) for females in Branch 1, $\bar{X}c_1f$ denotes the sample mean in the control group (the untidy neighborhood) for females in Branch 1.

[25] $\bar{X}t_2m$ denotes the sample mean in the treatment group (the tidy neighborhood) for males in Branch 2, $\bar{X}c_2m$ denotes the sample mean in the control group (the untidy neighborhood) for males in Branch 2. $\bar{X}t_2f$ denotes the sample mean in the treatment group (the tidy neighborhood) for females in Branch 2, $\bar{X}c_2f$ denotes the sample mean in the control group (the untidy neighborhood) for females in Branch 2.

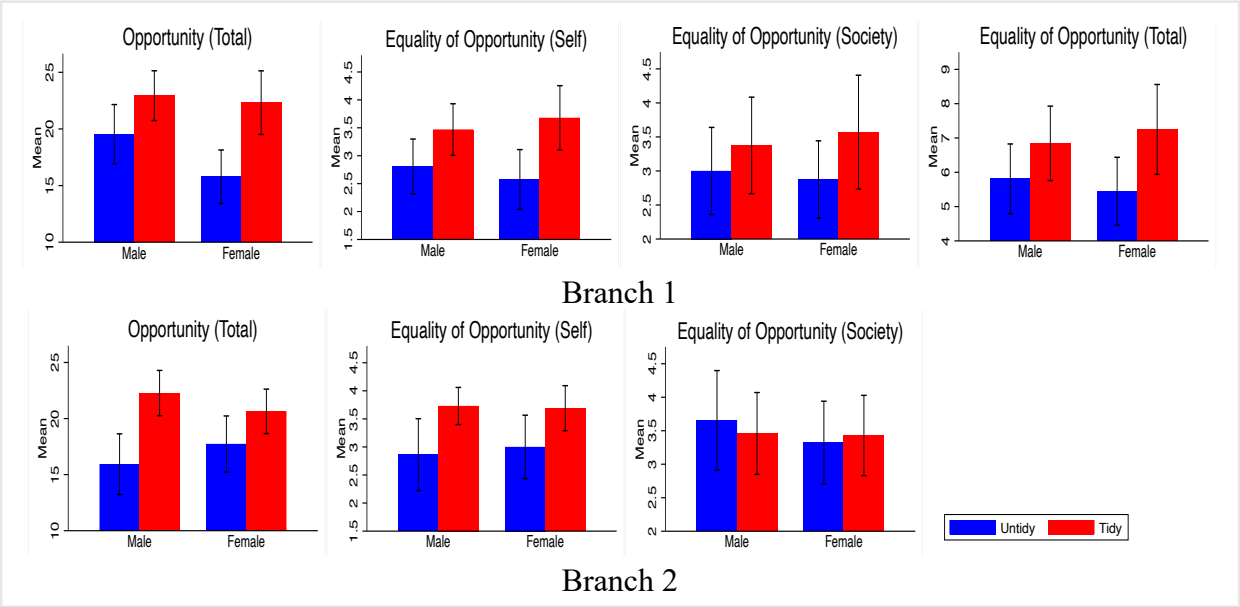

Figure 7.8 Means of Opportunity Beliefs by Gender with 95% CI, 2021

Notes: The treatment group is the tidy neighborhood. The control group is the untidy neighborhood.

Table 7.8 Wilcoxon-Mann-Whitney test of Opportunity Beliefs by Treatment and Gender, 2021[26]

	Branch 1	Branch 2
Perceptions of Opportunity (Total)		
Male	-1.71	-3.43***
Female	-3.37***	-1.61
Perceptions of Equality of Opportunity (Self)		
Male	-1.93	-2.44*
Female	-2.84**	-1.88
Perceptions of Equality of Opportunity (Society)		
Male	-.59	.31
Female	-1.22	-.18
Perceptions of Equality of Opportunity (Total)		
Male	-1.21	--
Female	-2.04*	--

Notes: * p < .05 ** p < .01 ***p < .001

[26] Two independent samples *t*-test results please see Table C9 in the Appendix C. The results are similar with Wilcoxon-Mann-Whitney test results.

7.3.2 Political Ideology

Figure 7.9 demonstrates the means of outcomes in each political ideology subgroup. Table 7.9 provides the Wilcoxon-Mann-Whitney test results. According to the Wilcoxon-Mann-Whitney test, the treatment only generated significant influence on liberals (the only exception is that conservatives under the treatment condition in Branch 1 perceive more opportunities than conservatives under the control condition in Branch 1, "Opportunity (Total)," $\bar{X}t_1c = 23.71$ vs. $\bar{X}c_1c = 17.77$[27]). Liberals in the treatment groups perceived significant more opportunities ($\bar{X}t_1l =$ 21.63 vs. $\bar{X}c_1l = 15.55$, $\bar{X}t_2l = 21.63$ vs. $\bar{X}c_2l = 15.13$[28]), and are significantly more likely to approve the equality of opportunity when compare themselves to others, than liberals under the control settings ($\bar{X}t_1l = 3.38$ vs. $\bar{X}c_1l = 3$, $\bar{X}t_2l = 3.47$ vs. $\bar{X}c_2l = 2.47$). Therefore, *Hypothesis 1* and *Hypothesis 2* got supported among people who are politically liberal. Overall, liberals are least likely to agree that opportunities are distributed equally, compared to people who consider themselves as conservative or moderate (the bars of liberals in the treatment and control groups are the lower than the bars of moderates and conservatives for "Equality of Opportunity (Self)," "Equality of Opportunity (Society)," and "Equality of Opportunity (Total)" correspondingly, in Figure 7.9). These results are consistent with the results from the 2018 CCES data and can be explained by higher standards of fairness held by the liberals.

[27] $\bar{X}t_1c$ denotes the sample mean in the treatment group (the tidy neighborhood) for conservatives in Branch 1, $\bar{X}c_1c$ denotes the sample mean in the control group (the untidy neighborhood) for conservatives in Branch 1.

[28] $\bar{X}t_1l$ denotes the sample mean in the treatment group (the tidy neighborhood) for liberals in Branch 1, $\bar{X}c_1l$ denotes the sample mean in the control group (the untidy neighborhood) for liberals in Branch 1. $\bar{X}t_2l$ denotes the sample mean in the treatment group (the tidy neighborhood) for liberals in Branch 2, $\bar{X}c_2l$ denotes the sample mean in the control group (the untidy neighborhood) for liberals in Branch 2.

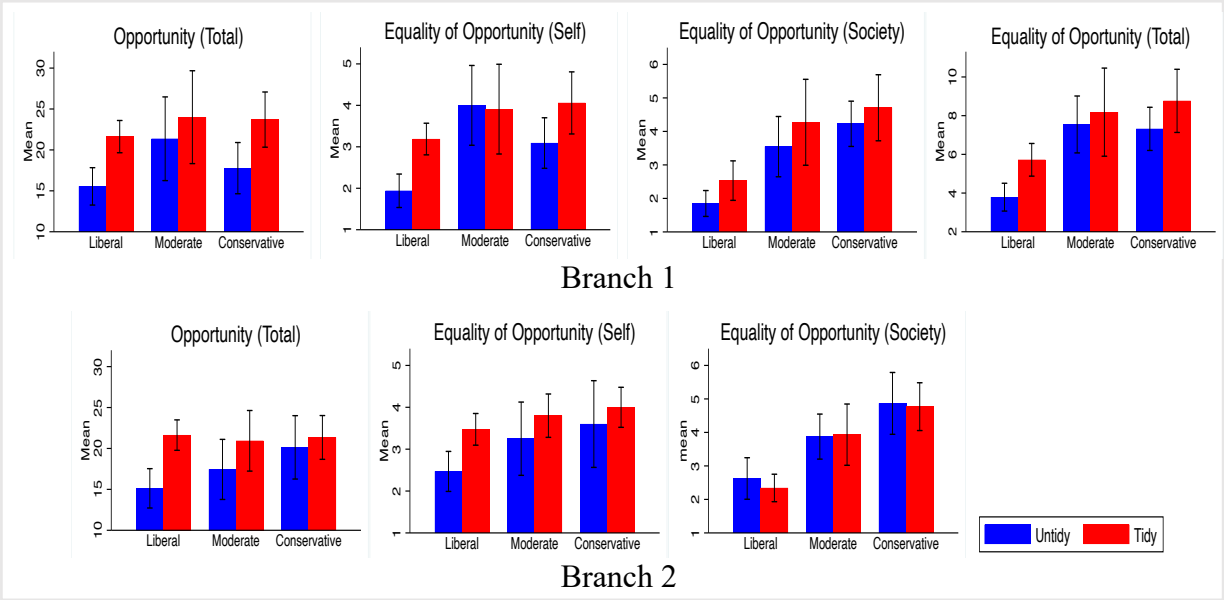

Figure 7.9 Means of Opportunity Beliefs by Ideology with 95% CI, 2021

Notes: The treatment group is the tidy neighborhood. The control group is the untidy neighborhood.

Table 7.9 Wilcoxon-Mann-Whitney test of Opportunity Beliefs by Treatment and Ideology, 2021[29]

	Branch 1	Branch 2
Perceptions of Opportunity (Total)		
Liberal	-3.48***	-3.83***
Moderate	-.72	-1.13
Conservative	-2.4*	-.14
Perceptions of Equality of Opportunity (Self)		
Liberal	-4.17***	-3.02**
Moderate	.07	-1.01
Conservative	-1.93	-.24
Perceptions of Equality of Opportunity (Society)		
Liberal	-1.71	.11
Moderate	-.89	-.06
Conservative	-.72	.22
Perceptions of Equality of Opportunity (Total)		
Liberal	-3.49***	--
Moderate	-.50	--
Conservative	-1.39	--

Notes: * $p < .05$ ** $p < .01$ ***$p < .001$

7.4 Discussion

With the two-rounded survey experiments, I have explored the causality and causal mechanism between the built environment in neighborhoods and opportunity beliefs. Overall, the hypotheses of the Opportunity Beliefs Theory are supported by the survey experimental data. The built environment of neighborhoods provides emotional signs for residents. People who live in a well-maintained neighborhood receive positive emotional signals, then generate high levels of self-efficacy. Their high levels of self-efficacy form their opportunity beliefs. They perceive that

[29] Two independent samples *t*-test results please see Table C10 in the Appendix C. The results are similar with Wilcoxon-Mann-Whitney test results.

there are more opportunities for themselves and their children for getting ahead in lives. They also believe that opportunities are equally distributed. For perceptions of equality of opportunity, with the 2021 survey experiment, the impacts of the built environment are stronger and statistically significant for respondents who were assigned into the control group in Branch 1.

In spite of the advantages of the survey experiments, they also have shortcomings. First, because they are not randomly sampled and the sample sizes are relatively small, the two survey experiments face a low external validity challenge, especially for the survey experiment in spring 2021 which loses a fair portion of data. The 2018 CCES has a high-level of external validity and can complement this disadvantage of survey experiments. Triangulation in this research minimizes the inadequacies of a single data source and enhances the credibility of this research. In addition, the small sample limits subgroup analysis because some subgroups contain just a few observations. For instance, only 17 out of 318 of black respondents are included in the 2019 survey experiment dataset and just 9 out of 268 black respondents are incorporated in the 2021 dataset. Only 25 respondents recognize their party identity as independent in Branch 1 of 2021 survey experiment and just 25 people categorize themselves as high income level in Branch 2. A small number of observations may lead to large bias for statistical analysis. Thus, this research only focuses on gender and political ideology to do the subgroup analysis. This disadvantage should be easily improved in future studies with collecting a larger sample. Last but not least, the survey experiments ask participants to imagine that they are living in a neighborhood like the pictures shown. The researchers can't know exactly about the conditions of respondents' own neighborhoods. To solve this problem, though I cannot tell the exact living environments for the respondents, I roughly collect information and understand that most of the participants of the survey experiment live in a richer neighborhood than the picture showed. In the survey

experiment in 2019, 84.85% respondents in the control group (badly-maintained) thought now they actually lived in a more or much more attractive neighborhoods compared to the neighborhoods shown by the picture, while 90.54% respondents in the treatment group (well-maintained) stated that their neighborhoods were about the same, more attractive, or much more attractive than the neighborhood exhibited in the picture. In the 2021 survey experiment, 84.85% people in the control group of Branch 1 and 93.65% participants under the control setting of Branch 2 considered their own neighborhoods were more or much more attractive than the neighborhood shown in the pictures. 95% respondents in the treatment group of Branch 1 and 89.87% participants under the treatment condition of Branch 2 reported they lived in a similar or more attractive neighborhoods compared to the pictured neighborhoods. Since most participants come from more pleasant neighborhoods in their real lives than the picture neighborhood, they probably hold a more unfavorable attitude towards poorly-maintained neighborhoods.

CHAPTER 8 CONSLUSIONS AND POLICY IMPLICATIONS

8.1 Conclusions

This study aims to examine the interaction between people and the environment. Particularly, this research probes how the living environment affects our thoughts and beliefs. With an exploration of the interaction between the environment and human beliefs towards themselves and the society, this research contributes to the theoretical development in social psychology and positive psychology. Individuals are largely affected by their environment. The positive or negative signals existing in their living environment form people's psychological arousal, self-evaluation, and even educational and occupational choices and experiences. Based on studies in social psychology and positive psychology, I develop the Opportunity Beliefs Theory, and argue that the living environment can rouse emotions consciously and subconsciously, and individuals respond to the incentives from their living environment when they evaluate their self-efficacy. Then these emotions and self-efficacy largely affect people's expectations for the future. According to the Opportunity Beliefs Theory, for people with low/middle income, those who live in a neighborhood with a better-maintained built environment are more likely to possess positive emotions and hold a high-level of self-efficacy. Furthermore, these residents will perceive more opportunities for themselves and their children to get ahead in life, and they are more likely to agree that the opportunities are distributed equally in the society. Based on the Opportunity Beliefs Theory, I put forward and test 7 hypotheses with three difference data sources.

To explore the causality between the built environment in neighborhoods and opportunity beliefs, mixed methods are deployed in this research to test hypotheses. Utilizing the

observational study and the online survey experiment, this research has demonstrated that the built environment of the living area has an important impact on people's opportunity beliefs. Generally, all hypotheses were supported/partially supported by the results. Living in a better-maintained neighborhood can arouse positive emotions and higher levels of self-efficacy among its residents. Then, the causal link between the built environment and the perceptions of opportunity is established by results from the survey experiments, while only the correlation between the built environment and perceptions of inequality of opportunity has been observed in the CCES data. On the whole, the Opportunity Beliefs Theory is underpinned with this research. Table 8.1 summarizes the results of testing each hypothesis in each data source.

Table 8.1 Hypotheses Testing Results Summary

	2018 CCES	2019 Survey Experiment	2021 Survey Experiment
H1 Perceptions of opportunity, Tidy > Untidy	No	Yes	Yes
H2 Perceptions of equality of opportunity, Tidy > Untidy	Yes	No	Yes (partially)
H3 Self-efficacy, Tidy > Untidy	N/A	Yes	Yes
H4 Perceptions of opportunity, High self-efficacy > Low self-efficacy	N/A	Yes	Yes
H5 Perceptions of equality of opportunity, High self-efficacy > Low self-efficacy	N/A	No	Yes
H6 Positive emotions, Tidy > Untidy	N/A	Yes	Yes
H7 Self-efficacy, Positive emotion > Negative emotion	N/A	Yes	Yes (partially)

Notes: The treatment variable of the built environment in a neighborhood is denoted as Tidy (the treatment group) versus Untidy (the control group).

According to Table 8.1, the CCES study finds the positive correlation between the built environment in neighborhoods and perceptions of equality of opportunity, but no significant relationship between the built environment and perceptions of opportunity has been detected.

The question narrative may lead to the insignificance of the influence of the built environment on the perceptions of opportunity from the CCES data analysis. In the CCES, I asked people whether they agree or disagree that "children today have more opportunities for getting ahead in life compared to children from my own generation." The narrative may lead the respondents to evaluate the opportunities for children today in the whole society compared to children in their own generation, rather than specifically thinking about the opportunities which can be accessed by their own children. To overcome this shortcoming, in the online survey experiments, I designed 4 questions in the 2019 survey experiment and 6 question in the 2021 survey experiment to measure the concept of perceptions of opportunity. The question narrative has also been changed in the survey experiments. The respondents were asked to assess the opportunities for their own children and themselves. With these changes, the built environment plays a significant role in shaping residents' perceptions of opportunity.

One potential reason that *Hypothesis 2* and *Hypothesis 5* are not supported or partially supported in the survey experiments is because participants in the survey experiments were asked to imagine that they lived in the neighborhoods displayed in the pictures. The imagination of living in a neighborhood and forming opinions are different from the real context. To assess this disadvantage, I included the questions which asked respondents to evaluate whether their own neighborhood in real life is better, similar, or worse than the neighborhood shown in the pictures. With this question, I can roughly collect information about their neighborhoods. Most participants indicated that their own neighborhoods are better than the pictured neighborhood (control group), or better or about the same with the pictured neighborhood (treatment group). Therefore, most participants in both treatment and control groups live in a better neighborhood than the pictured working-class neighborhood in their real lives. One or two pictures may not

provide enough incentives to change participants' general beliefs about fairness. Thus, the results of the impacts of the built environment on perceptions of equality of opportunity are not encouraging in the survey experiments. The CCES survey does not share this disadvantage because the CCES study has a nation-wide sample and a high level of external validity. Respondents were asked about the built environments of the neighborhoods they are living, then they reported their opportunity beliefs. The positive correlation between the physical environment of a neighborhood and perceptions of equality of opportunity has been detected with the CCES survey data.

As a next step, I plan to employ some other technologies, such as Virtual Reality (VR) technology, in my experiment to provide more substantial incentives for the participants. In addition, triangulation of multiple quantitative and qualitive methods should produce more solid arguments and improve the valid inference for this research. I also expect to invite residents from local communities to participate in interviews and focus groups to discuss the physical and social environments of their neighborhoods, the trust among neighbors, self-efficacy and opportunity beliefs.

The research also locates other factors which have important impacts on the opportunity beliefs. The most important three elements are political ideology, opinions towards meritocracy, and racial composition in a neighborhood. People who are liberal hold a more negative stance when evaluating opportunities for the next generation and opportunity distributions, compared to people who are moderate or conservative. Meanwhile, people who accept meritocratic beliefs are more likely to carry a more positive attitude towards opportunities for children and agree that there is an equal distribution of opportunities. Additionally, residents from a more racially diverse neighborhoods are more likely to perceive more opportunities for children and approve

the perceptions of equality of opportunity. In addition, education, home ownership, family income changes, and opinions on income gap also have influences on opportunity beliefs. In future study, I will collect a larger sample to ensure that each subgroup has a considerable sample size so that I can conduct more valid subgroup analyses to explore how the built environment affects opportunity beliefs conditioning on other pretreatment covariates, such as race. Moreover, I will make use of a hierarchical model in future studies considering different historical backgrounds and policies in each state.

8.2 Policy Implications

Improving people's quality of life is an essential goal for governments and it requires continuous efforts. The World Health Organization (WHO) defines Quality of Life as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns." (World Health Organization 1998) Self-evaluation and physical environment are important indicators to evaluate individuals' quality of life (World Health Organization 1998). This research provides a solid and comprehensive exploration of the interaction of built environment and psychological states and puts forward a practical and efficient method to improve quality of life, reduce poverty, stimulate social mobility, and then promote social justice. It has significant implications for neighborhood revitalization, neighborhood governance, public health, poverty reduction, and redistributive policy.

Development economists have pointed out that to get out of the poverty traps, not only external constraints, but also the internal constraints (such as limited aspirations) play a vital role in the process (Ray 2006). This research enhances knowledge about factors that shape

individuals' opinions about opportunity for upward social mobility and fairness. It provides insights to the fields of income inequality, social mobility, and political stability. This study demonstrates that increasing public investments for improving the physical environment of impoverished neighborhoods, such as a good maintenance of roads, streets, and buildings in neighborhoods, is beneficial for the residents in these neighborhoods in multiple ways. When we talk about neighborhood maintenance, it is important to remember that neighborhood condition is an impure public good. The maintenance of the built environment of a neighborhood not only relies on individual residents, but also the community and support from the governments and nonprofit organizations, especially for those underprivileged neighborhoods. First, the public investments will directly increase the unfavorable living conditions of the disadvantaged groups and provide the residents with a clean and healthy living environment. At the same time, prior research has demonstrated that a better physical neighborhood environment will improve social relationships among neighbors and promote residents' sense of community and social cohesion (Wilkerson et al. 2012; Brown, Perkins, and Brown 2003; Plas and Lewis 1996). Residents will also engage in more physical activities (Saelens, Sallis and Frank 2003; Franzini et al. 2009). All these improvements will contribute to enhancing residents' physical and mental health conditions (Wilkerson et al. 2012; Saelens, Sallis and Frank 2003; Franzini et al. 2009; Ellen, Mijanovich, and Dillman 2001). More importantly, this research suggests that these citizens will obtain a more optimistic view towards themselves and their children. Residents' self-efficacy may be increased if the built environment of their neighborhoods are enhanced. They will have greater confidence in their abilities and be more willing to pursue their goals and live better lives. In addition, they will have higher expectations for the future of themselves and their children. Since the built environment can increase self-efficacy, enhance perceptions of opportunity, and

promote the perceptions of equality of opportunity, building a built environment is an important component of serving poorer neighborhoods. Social workers, volunteers, and neighborhood-based associations and other nonprofit organizations should be more actively involved in this process of assisting the residents to renovate the built environment of their neighborhoods, and in this way, to help and support the residents build up their confidence about their capabilities and promote more prospects for better lives in the future. Nevertheless, neighborhoods upkeep is not a panacea, and it should be accompanied by additional strategies to promote the quality of life for low-income individuals. For example, while the low-income residents are encouraged to be self-motivated through an enhanced built environment, policy-makers and nonprofit organizations should also provide more job training and educational programs or opportunities for these residents to strengthen their professional skills and abilities so that they will be more competitive on labor market.

Previous research has shown that programs, such as Moving to Opportunity, have positive impacts on children's achievement in the future (Chetty, Hendren, and Katz 2016), but moving to opportunity has limitations regarding personal preferences and conditions. This research demonstrates that renovating poorly-maintained neighborhoods can increase quality of life and promote fairness. These results are inspiring and deserve attentions from policy-makers and nonprofit organization leaders. Yet, one potential risk is that improving neighborhood conditions may increase the residential real estate price premium (Seo 2020) and cause gentrification. Gentrification is harmful from the perspective of the displaced poor and deviates from the goal of enhancing opportunity beliefs. Policies like inclusionary zoning are solutions to protect the rights of the low-income original residents. Through inclusionary zoning policies, governments require or encourage developers to provide a percentage of affordable residential units of any

new development for people from a designated income level, which is usually defined by median income, during an affordable period (Lerman 2006). Thus, inclusionary zoning policies are a mean for local governments to provide affordable housing, foster neighborhood integration, reduce residential segregation, and dilute poverty concentration (Kontokosta 2015; Lerman 2006; Mukhija et al. 2015). When the property values increase because of the improvement of the built environment in neighborhoods as I proposed in this research, the local governments can design and implement policies like inclusionary zone ordinances to prevent the economically disadvantaged residents being driven out of their original neighborhoods. Previous research has indicated that neighborhood income integration brings positive social impacts (Rosenbaum, Stroh, and Flynn 1996; Brophy and Smith 1997). For example, Rosenbaum, Stroh, and Flynn (1996) examines a mixed-income housing project, Lake Parc Place, administered by the Chicago Housing Authority, and finds that the project provides safer housing for both low-income and working-class residents. With the inclusionary zone ordinances, the original residents can enjoy the benefits of improving their neighborhoods. This practice is meaningful for achieving social justice.

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APPENDIX A SHAPIRO-WILK TEST FOR NORMALITY

Table A1 Shapiro-Wilk Test for Normality, 2019

	Treatment Group	Control Group
	W	*W*
Dependent Variables		
Higher Education	.97***	.97**
Higher Income	.99	.98*
Higher Social Status	1.00	.98*
More Opportunities	.99	.98*
Perception of Opportunity (Total)	.98*	.98**
Perceptions of Equality of Opportunity	.97**	.97***
Mediator		
Pursuing Goals	.97**	.99
Out of Jam	.97***	1.00
Meeting Goals	.98*	.98
Have Aspiration	.96***	.99
Insecure about Ability	.98*	.99
Give Up Easily	.95***	.98*
Accept Reality	.98*	.98*
Self-Efficacy (Total)	.97**	.99
Emotional Items		
Hopeful	.98*	.97***
Depressed	.99	.97***
Safe	.98*	.96***
Carefree	.99	.97***
Powerful	.99	.97***
Emotion (Total)	.99	.98**
Observations	148	170

Notes: * p < .05 ** p < .01 ***p < .001
we reject that the variable is normally distributed when P < .5.

Table A2 Shapiro-Wilk Test for Normality, 2021

	Branch1		Branch2	
	Treatment	Control	Treatment	Control
	W	*W*	*W*	*W*
Dependent Variables				
High Income (Self)	.99	.96*	1.00	.96
High Social Status (Self)	.99	.96*	.99	.96*
Higher Education (Child)	.99	.98	.97	.96*
Higher Income (Child)	1.00	.97	.99	.95*
Higher Social Status (Child)	1.00	.97	.99	.95*
More Opportunities (Child)	.99	.97	1.00	.96*
Perceptions of Opportunity (Total)	.99	.97	.99	.95*
Equality of Opportunity (Self)	.99	.96*	1.00	.96*
Equality of Opportunity (Society)	.96*	.94**	.96*	.94**
Perceptions of Equality of Opportunity (Total)	.97	.95*	--	--
Mediator				
Pursuing Goals	.99	.98	--	--
Out of Jam	.95*	.98	--	--
Meeting Goals	.98	.99	--	--
Have Aspiration	.97	1.00	--	--
Insecure about Ability	.96	.96*	--	--
Give Up Easily	.94**	.99	--	--
Accept Reality	.94**	.99	--	--
Self-Efficacy (Total)	.96	.99	--	--
Emotional Items				
Hopeful	.99	.86***	.99	.86***
Depressed	.88***	.99	.92***	1.00
Safe	.98	.92***	.99	.92***
Anxious	.88***	.99	.89***	1.00
Powerful	.84***	.77***	.87***	.72***
Disgust	.82***	.98	.81***	.98
Emotion (Total)	.98	.97	.96*	.98
Observations	60	66	79	63

APPENDIX B BALANCE TEST

Table B1 Balance Test, Wilcoxon-Mann-Whitney Test of Mean Comparison of Outcomes, Mediators and Emotions, by Employment Status in the Treatment and Control Group, 2019

Employed vs. Not employed	*z*-value	
	Treatment	Control
Outcomes		
Higher Education	.58	-.62
Higher Income	-.09	-.37
Higher Social Status	-.73	-.41
More Opportunities	.04	-.46
Perception of Opportunity (Total)	-.15	-.40
Perceptions of Equality of Opportunity	-1.06	-1.64
Mediator		
Pursuing Goals	.39	-.57
Out of Jam	.45	-1.15
Meeting Goals	.69	.62
Have Aspiration	.01	.30
Insecure about Ability	.91	.95
Give Up Easily	-.50	1.24
Accept Reality	-.57	-.12
Self-Efficacy (Total)	.18	-.39
Emotional Items		
Hopeful	.40	.09
Depressed	.22	-1.63
Safe	.43	.37
Carefree	-.19	.18
Powerful	-.16	.19
Emotion (Total)	.00	.88

Notes: * p < .05 ** p < .01 ***p < .001

Table B2 Balance Test, Wilcoxon-Mann-Whitney Test of Mean Comparison of Outcomes, Mediators and Emotions, by Living Area in the Treatment and Control Group, 2021 Branch 2

Urban vs. Suburban vs. Rural	x^2(*df* = 2)		x^2(*df* = 2) with ties	
	Treatment	Control	Treatment	Control
Outcomes				
High Income (Self)	3.42	.16	3.67	.17
High Social Status (Self)	1.39	.72	1.46	.76
Higher Education (Child)	4.05	.85	4.37	.89
Higher Income (Child)	5.41	.07	5.78	.07
Higher Social Status (Child)	1.79	1.20	1.93	1.28
More Opportunities (Child)	3.98	.30	4.20	.31
Perceptions of Opportunity (Total)	5.14	.08	5.16	.08
Equality of Opportunity (Self)	5.04	.59	5.37	.61
Equality of Opportunity (Society)	1.33	.31	1.37	.33
Emotional Items				
Hopeful	.83	.48	.94	.66
Depressed	.03	.12	.04	.13
Safe	.42	.89	.54	1.04
Anxious	.43	.59	.59	.63
Powerful	1.07	1.18	1.48	2.93
Disgust	1.87	.62	3.81	.68
Emotion (Total)	.28	.01	.29	.01

Notes: * p < .05 ** p < .01 ***p < .001
The null hypothesis is all means are equal. Reject the null hypothesis when p < .5.

APPENDIX C TWO INDEPENDENT SAMPLES T-TEST (TWO-TAILED) RESULTS

Table C1 Two Independent Samples *t*-test (Two-Tailed) Results of Opportunity Beliefs by Treatment, 2019

Opportunity Beliefs	*t*-Value
Expect higher education for children	-6.36***
Expect higher income for children	-4.48***
Expect higher social status for children	-3.95***
Expect more opportunities for children	-5.29***
Perceptions of Opportunity (Total)	-5.43***
Perceptions of Equality of Opportunity	-.02

Notes: * p < .05 ** p < .01 ***p < .001

Table C2 Two Independent Samples *t*-test (Two-Tailed) Results of Self-Efficacy by Treatment, 2019

Self-Efficacy	*t*-Value
Pursuing Goals	-4.90***
Out of Jam	-4.63***
Meeting Goals	-5.79***
Have Aspiration	-2.38*
Insecure about Ability	5.50***
Give Up Easily	3.77***
Accept Reality	1.89
Self-Efficacy (Total)	-5.20***

Notes: * p < .05 ** p < .01 ***p < .001

Table C3 Two Independent Samples *t*-test (Two-Tailed) of Emotional Variables by Treatment, 2019

Emotions	*t*-Value
Hopeful	-8.77***
Depressed	6.39***
Safe	-9.75***
Carefree	-7.72***
Powerful	-7.84***
Emotion (Total)	-9.86***

Notes: * p < .05 ** p < .01 ***p < .001

Table C4 Two Independent Samples *t*-test (Two-Tailed) of Opportunity Beliefs by Treatment and Gender, 2019

	t-value
Perceptions of Opportunity (Total)	
Male	-5.09***
Female	-2.32*
Perceptions of Equality of Opportunity	
Male	-.25
Female	.30

Notes: * p < .05 ** p < .01 ***p < .001

Table C5 Two Independent Samples *t*-test (Two-Tailed) of Opportunity Beliefs by Treatment and Ideology, 2019

	t-value
Perceptions of Opportunity (Total)	
Liberal	-4.55***
Moderate	-1.01
Conservative	-3.37**
Perceptions of Equality of Opportunity	
Liberal	-.53
Moderate	1.45
Conservative	-.92

Notes: * p < .05 ** p < .01 ***p < .001

Table C6 Two Independent Samples *t*-test (Two-Tailed) of Opportunity Beliefs by Treatment, 2021

Opportunity Beliefs	Branch 1	Branch 2
Expect higher income for themselves	-2.82**	-2.04*
Expect higher social status for themselves	-3.43***	-2.01*
Expect higher education for children	-4.93***	-4.76***
Expect higher income for children	-4.21***	-4.24***
Expect higher social status for children	-3.02**	-2.94**
Expect more opportunities for children	-3.99***	-4.13***
Perceptions of Opportunity (Total)	-4.23***	-3.90***
I have equal opportunities like everyone else	-3.40***	-3.20**
Everyone has equal opportunities in the society	-1.58	.10
Perceptions of Equal Opportunity (Total)	-2.61*	--

Notes: * p < .05 ** p < .01 ***p < .001

Table C7 Two Independent Samples *t*-test (Two-Tailed) of Self-Efficacy by Treatment, Branch 1, 2021

Self-Efficacy	*t*-Value
Pursuing Goals	-4.35***
Out of Jam	-3.93***
Meeting Goals	-4.65***
Have Aspiration	-2.54*
Insecure about Ability	4.63***
Give Up Easily	3.67***
Accept Reality	3.11**
Self-Efficacy (Total)	-4.78***

Notes: * p < .05 ** p < .01 ***p < .001

Table C8 Two Independent Samples *t*-test (Two-Tailed) of Emotions by Treatment, 2021

Emotions	Branch 1	Branch 2
Hopeful	-5.55***	-4.80***
Depressed	6.94***	6.11***
Safe	-6.45***	-5.94***
Anxious	5.40***	5.54***
Powerful	-2.55*	-2.48*
Disgust	6.34***	6.13***
Emotion (Total)	-7.82***	-7.34***

Notes: * p < .05 ** p < .01 ***p < .001

Table C9 Two Independent Samples *t*-test (Two-Tailed) of Opportunity Beliefs by Treatment and Gender, 2021

	Branch 1	Branch 2
Perceptions of Opportunity (Total)		
Male	-1.98	-3.79***
Female	-3.53***	-1.83
Perceptions of Equality of Opportunity (Self)		
Male	-1.93	-2.53*
Female	-2.73**	-2.02*
Perceptions of Equality of Opportunity (Society)		
Male	-.76	.41
Female	-1.42	-.24
Perceptions of Equality of Opportunity (Total)		
Male	-1.35	--
Female	-2.21*	--

Notes: * p < .05 ** p < .01 ***p < .001

Table C10 Two Independent Samples *t*-test (Two-Tailed) of Opportunity Beliefs by Treatment and Ideology, 2021

	Branch 1	Branch 2
Perceptions of Opportunity (Total)		
Liberal	-3.98***	-4.30***
Moderate	-.68	-1.32
Conservative	-2.53*	-.52
Perceptions of Equality of Opportunity		
Liberal	-4.44***	-3.30**
Moderate	.12	-1.05
Conservative	-2.00	-.79
Perceptions of Equality of Opportunity		
Liberal	-1.93	.77
Moderate	-.92	-.10
Conservative	-.82	.16
Perceptions of Equality of Opportunity		
Liberal	-3.45**	--
Moderate	-.46	--
Conservative	-1.50	--

Notes: * $p < .05$ ** $p < .01$ ***$p < .001$