

EXAMINING ASSOCIATIONS AMONG ASPECTS OF ETHNIC-RACIAL
IDENTITY DEVELOPMENT AND PEER NETWORK INTEGRATION IN
ADOLESCENCE

by

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Network Integration in Adolescence

A Thesis submitted in partial fulfillment of the requirements for the degree of Master of
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DEDICATION

This is dedicated to my supportive family and friends.

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I would like to thank the many friends, relatives, and supporters who have made this happen. Dr. Kornienko and the other members of my committee were of invaluable help.

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LIST OF ABBREVIATIONS

| | |
|---|-------|
| Ethnic-racial Identity | ERI |
| Social Network Analysis..... | SNA |
| The brief form of the Ethnic Identity Scale | EIS-B |

ABSTRACT

EXAMINING ASSOCIATIONS AMONG ASPECTS OF ETHNIC-RACIAL IDENTITY DEVELOPMENT AND PEER NETWORK INTEGRATION IN ADOLESCENCE

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George Mason University, 2022

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Ethnic-racial identity (ERI) development unfolds as a series of interrelated processes in which adolescents explore what it means to be a member of their ethnic-racial group, often in the context of peer relationships. This study examines how ERI exploration, ERI resolution, and ERI affirmation are associated with social network prestige and centrality, and tests whether this relationship differs as a function of grade and ethnic-racial background. The sample consisted of 279 sixth and 435 ninth graders from four public schools in a large metropolitan area in the Southwestern United States. Hierarchical multiple regression analyses were conducted to examine the associations between ERI exploration, resolution, and affirmation and the three measures of social integration derived from social network analysis (SNA). Results indicated that the number of mutual friendships was positively associated with ERI resolution and ERI affirmation. ERI affirmation was negatively related to proximity prestige, which is based on incoming ties and captures individuals' degree of popularity within their social

network . Additionally, ERI resolution and ERI affirmation were positively associated with Bonacich centrality, which is based on outgoing ties and captures individual's level of centrality within their social network . Moderation analyses were used to determine whether these associations varied as a function of grade (sixth or ninth) and self-reported ethnicity (White, 'other,' and Hispanic). Four significant interaction effects were found: (1) The relationship between ERI resolution development and the number of mutual friendships was stronger for sixth grade students compared to ninth grade students; (2) The relationship between ERI exploration development and the number of mutual friendships was stronger and positive for participants who identified as Hispanic ethnicity than participants who identified as White or 'other' ethnicity; (3) The relationship between ERI resolution development and proximity prestige was stronger and negative for participants who identified as other ethnicity, which encompassed participants who self-identified as Black or African American, Asian, American Indian, Pacific Islander, or 'other' ethnicity, compared to participants who identified as Hispanic or White ethnicity; and (4) The relationship between ERI resolution development and Bonacich centrality was stronger and negative for participants who identified as other ethnicity than participants who identified as Hispanic or White ethnicity. These results underscore the utility of social network analysis (SNA) in developmental research to elucidate the associations between specific aspects of ERI development and adolescents' integration within their peer social networks.

CHAPTER ONE: INTRODUCTION

Adolescence is a multifaceted and dynamic developmental stage when one cultivates fundamental aspects of ethnic and social identity (Adams & Marshall, 1996). During this sensitive transition period, individuals engage in increased experimental and exploratory behaviors while making decisions regarding various aspects of their physical and psychological selves (Adams & Marshall, 1996). At the same time, individuals begin to spend increased time with peers and rely more heavily on their support (Kindermann, 2016). Although research has documented a relationship between an individuals' identity development and their peer social networks, less information is known regarding the impact of specific aspects of ethnic-racial identity (ERI) development on adolescent integration within their peer networks. Social integration with peers increases adolescents' experiences of social support and discussions related to what it means to be a member of a particular racial or ethnic category (Syed & Juan, 2012). Thus, it is essential to understand individual factors related to peer network integration (Cohen & Syme, 1985). Previous research exploring the relationship between ERI development and social network integration in adolescence has been limited, especially concerning the impact of the adolescent stage (early versus middle) on this relationship.

The present study seeks to understand how distinct aspects of ERI development – namely, ERI exploration, resolution, and affirmation -- are related to several measures of

peer integration or connectedness with others, which captures the degree to which an individual is embedded in their social network (Kornienko et al., 2015). Thus, the first goal of this research is to determine if specific aspects of ERI development: exploration, resolution, and affirmation, are related to social integration, measured through the number of mutual nominations, proximity prestige, and Bonacich centrality.

Additionally, while there is some evidence of differences in ERI development across early, middle, and late adolescence, questions remain as to whether the relationship between specific aspects of ERI and the amount of social integration is influenced by grade. The second aim of this study is to determine if the associations between ERI development aspects and the measures of peer network integration vary between early and middle adolescence (sixth and ninth). The third goal of this study is to better understand whether these associations vary across self-reported ethnicity and race. In the following sections, I discuss the existing literature on ERI development, adolescence, ERI development during adolescence, peer relationships in adolescence, and the relationship between ERI development and measures of social integration.

Ethnic-Racial Identity as a Developmental Asset

Ethnic-racial identity (ERI) development unfolds as a series of interrelated processes in which adolescents explore their ethnic-racial group membership (ERI exploration), gain a sense of clarity regarding what it means to be a member of their ethnic-racial group (ERI resolution), and cultivate positive affect toward their ethnic-racial group (ERI affirmation; Umaña-Taylor et al., 2014). When examining ERI development it is crucial to consider that these processes occur within diverse contexts

and relationships. In adolescence, peers become particularly important for the development of ethnic-racial identity. Research has shown that while adolescents tend to befriend others with similar levels of ERI development, ultimately, the dynamic interchange experienced within these close relationships leads to high similarities in their ERI development (Rivas-Drake et al., 2017; Santos et al., 2017).

Additionally, ERI is associated with various indicators of positive youth development. French et al. (2006) reported higher exploration associated with decreased participation in risky behavior for youth of color in adolescence's early and middle stages. A systematic review of 51 studies by Yip and colleagues (2019) found a composite of ERI exploration and commitment to protect against the adverse effects of discrimination on individuals' psychological and academic adjustment for youth of color. Additionally, specific aspects of ERI development (ERI exploration and resolution) were positively related to self-esteem in adolescents self-identifying as African American, Latinx, and Asian American (Umaña-Taylor et al., 2004). These findings indicate a possible relationship between specific dimensions of ERI development and adolescents' self-concept or view of themselves. Research shows that individuals who possess a more positive view of themselves are more likely compared to individuals who hold an unfavorable view of themselves to have highly developed social skills, experience increased support, and maintain affirmative relationships with peers (Marshall et al., 2014; Hoffman et al., 2019). Peer relations theory states that an individual's perception of themselves is related to their ability to establish and maintain relationships with peers.

Hoffman et al. (2019) cite this theory in their belief that aspects of one's social identity, such as ERI, influence adolescents' social relationships.

Ethnic-Racial Identity Development in Adolescence

Adolescence, which is identified as a critical time for identity development (Erikson, 1968), is often divided into three stages: early (12-14), middle (15-17), and late (18-21). While ethnic-racial identity research has focused on exploring individuals' identity development throughout adolescence, findings have demonstrated that it is essential to discern differences occurring within each stage. For instance, Huang and Stormshak (2011) found the ERI components of exploration, resolution, and affirmation to increase from early (sixth grade) to middle (ninth grade) adolescence. Additionally, Smith et al. (2006) documented a tendency of ERI affirmation to increase during the transition from early to middle adolescence, and during school transitions, such as the move from middle to high school. Changes in adolescents' school context is related to ethnic-racial identity development, such as more exposure to diversity and increased self-segregation and can lead to increased salience and importance of one's ethnic identity (Huang & Stormshak, 2011).

Previous research has demonstrated that adolescence is a critical stage in ERI development. Furthermore, compared to individuals in early adolescence, who rely more on peers for constructing their identity, individuals in middle and late adolescence tend to rely less on others, and experience increased independence in their decision-making (Steinberg & Monahan, 2007). Umaña-Taylor et al. (2004) posit that middle and late adolescents explore their ethnicity more than early adolescents.

Individuals strive to foster a cohesive identity during adolescence by integrating the self and society (Erikson, 1994; Marcia, 1967). Therefore, to facilitate exploration and development of their social identity, youth spend more time with peers (Adams & Marshall, 1996). Social identity theory proposes that group membership increases individuals' sense of belonging, promotes positive self-esteem and self-concept, and sets the foundation for much of the research on ethnic-racial identity (Phinney, 1990). Ethnic-racial identity (ERI) refers to individuals' attitudes and beliefs about their ethnic-racial group membership. Differences related to ethnicity and race have been explored in ERI development research; however, most ERI research has focused on ERI development in non-white populations. ERI has been found to be an especially salient social identity for adolescents belonging to minoritized ethnic groups in the United States (Rivas-Drake et al., 2014; Umaña-Taylor et al., 2014).

Understanding Ethnic-Racial Identity Development

Ethnic-racial identity is a multidimensional construct, showing the significance an individual places on their ethnicity or race when defining who they are (Sellers et al., 1998; Umaña-Taylor et al., 2014). The components of ERI are related to either the ERI development process (the exploration and then resolution in the progression of ERI development) or ERI content (the thoughts and feelings that could be included in an individual's ERI). While these dimensions are fundamentally related, they should also be recognized as unique (Douglass & Umaña-Taylor, 2015; Umaña-Taylor et al., 2014).

The ERI development process has been conceptualized and measured in terms of exploration, which involves participating in behaviors to learn more about one's culture

and background, and resolution, the certainty an individual holds regarding the meaning of their ethnic-racial identity (Umaña-Taylor et al., 2014). Umaña-Taylor et al. (2014) state how Phinney's (1989) work exploring identity development in adolescence, rooted in the ideas of Erickson (1968) and Marcia (1994), are the basis for research on the ERI development process. Examination of the topic has found that adolescents can gain self-confidence by participating in exploration and resolution. The ERI development process is both universal and promotive, meaning it is relevant to all youth and is associated with developmental benefits (Umaña-Taylor, 2016).

ERI content constructs are informed by social identity theory and include such ideas as ERI affirmation, public regard, centrality, and salience. ERI affirmation refers to how good or bad someone feels about being a member of their ethnic-racial group(s). This is especially crucial for diverse adolescents because feeling good about oneself has been shown to buffer the adverse effects of stereotypes and discrimination (Umaña-Taylor, 2016). Additional aspects of ERI development are how an individual believes that other people view their ethnic-racial group(s) (public regard), how significant an individual considers their ethnicity or race is to their identity (centrality), and how important an individual feels their ethnicity or race is in different situations (salience; Umaña-Taylor et al., 2014).

Over the last 50 years, researchers have become more interested in understanding ERI development due to the increase of ethnically diverse individuals in Western countries (Phinney, 1990). This work has shown that ERI is significantly associated with socioemotional development, psychological health, and academic competencies during

adolescence (Yip et al., 2019). Additionally, ERI has been found to serve a protective and promotive role for youth of color. Specific aspects of ERI content can buffer the adverse effects of discrimination, while ERI process development is beneficial regardless of whether the individuals experience adverse treatment from others (Umaña-Taylor, 2016; Yip et al., 2019).

For adolescents identifying as white, less research has been conducted examining their ERI development and their ethnicity's implications on their experiences. There are known differences in the ERI development of individuals of different races and ethnicities. Research by Moffitt et al., 2021 has demonstrated the need to approach ERI development in white youth populations with measures that focus on whiteness separately from race and ethnicity. Thus, demonstrating how little we know about ERI development in white populations and the potential need for measures to differ depending on the population of interest. Additionally, the individual's ethnicity or race and their and their parent's comfort with the topic have been found to impact children's social experiences by limiting the racial heterogeneity of their friend groups (Garner, 2022). Overall, there is a need for more information regarding the ERI development and racial socialization of white children and adolescents.

Ethnic-racial identity development occurs concurrently with experiences of discrimination (Umaña-Taylor, 2014). Youth of color struggle to maintain their own culture and heritage while encountering and coping with discrimination and prejudice from adults, peers, and media in their lives (Phinney, 1990). The construct of ERI supports minoritized individuals by providing them a way of understanding their

ethnicity and supporting them when faced with discriminatory threats (Weinreich, 1983). There are documented differences in ethnically diverse individuals' ERI development.

The number of ethnically/racially diverse individuals under age 18 is increasing rapidly in the United States. These individuals encounter profound verbal and physical discrimination as they develop in a society where their ethnic/racial group(s) are underrepresented in positions of power (Phinney, 1990). Research has shown that ethnic-racial discrimination is negatively related to psychological and social adjustment (Niwa et al., 2011; Sellers et al., 2006). Additionally, research shows that over time, adolescents become more aware of their ethnicity/race and more attuned to racial discrimination due to the development of their cognitive abilities and further exposure to diverse environments (Phinney, 1989).

For adolescents, especially those belonging to minoritized groups in the United States, ERI becomes an increasingly salient aspect of their social identity (Umaña-Taylor et al., 2014). Of these individuals, those who possess a more positive view of their ethnicity (ERI affirmation) and believe their ethnic-racial identity to be a crucial part of who they are (ERI centrality) are more likely to exhibit favorable academic, psychological, and emotional outcomes (Rowley et al., 1998; Sellers et al., 2003). The more central an adolescent feels their ERI is to who they are, the more likely they will immerse themselves in activities and surround themselves with individuals related to their culture(s) (Kiang et al., 2010).

Social Integration in Adolescence

Peers play a significant role in adolescents' development (Brown & Larson, 2009). Research has consistently demonstrated a positive relationship between supportive peer relationships and social and emotional adjustment in adolescence (Pernice-Duca, 2010). For instance, adolescents are less likely to report feelings of depression, distress, and loneliness when they perceive more emotional support from peers (Azmitia et al., 2013; Flook et al., 2005). In adolescence, the size of individuals' peer networks often expands, and individuals place increased importance on close friendships (La Greca & Prinstein, 1999). Additionally, close peer relationships become adolescents' primary source of social support (Furman & Buhrmester, 1992).

Although peer relationships take many forms, social integration into peer social networks is an especially relevant experience during adolescence. The construct of social integration captures the degree to which an individual is embedded in their social network and has implications for the flow of social support and other relevant developmental resources available to an individual (Berkman, 2008). A structural perspective of social integration recognizes that humans develop within the context of a complex social system. Thus, these networks reveal how individuals' relationships with others impede or support the development of various attitudes, behaviors, and skills (Berkman, 2000; Cohen & Syme, 1985).

High social integration within social networks is related to decreased mortality and health risk and increased participation in health promotive behaviors (Berkman, 2000). Additionally, researchers have demonstrated how integration into a social network can provide adolescents with opportunities to acquire information and resources and

experience increased social support (Borgatti et al., 2009). During adolescence, the primary source of support moves from parents to peers, with children reporting that they receive more support from family, while adolescents report increased support from peers (Colarossi & Eccles, 2000; Levitt et al., 1993). Supportive peer relationships during adolescence are related to numerous psychological and physical benefits. Researchers have found peer social support to influence individuals' achievement, learning, and academic confidence and play a role in the etiology and treatment of physical and psychological illness (Cohen & Syme, 1985; Dennis et al., 2005). Therefore, there is reason to believe that social integration with peers may be crucial during adolescence.

Researchers have argued that it is essential for youth belonging to ethnic-racial minority groups to develop within supportive social networks (Umaña-Taylor et al., 2014). Through peer relationships, youth learn the interpersonal strategies necessary for interacting with members of other ethnic-racial groups, including the racial majority (Harrison et al., 1990). Levitt et al. (1993) examined the social support networks of ethnically diverse youth in the United States. The study revealed that regardless of ethnicity, the composition of networks endured normative transitions throughout childhood and adolescence. In middle childhood, peers emerge as crucial providers of support (Levitt et al., 1993). The networks of ethnically diverse youth differ regarding the specific functions and amount of support provided by the individuals within their network (Levitt et al., 1993). While ethnically diverse children and adolescents' social networks retain similar compositions, specific benefits from high integration within their networks may vary across ethnic-racial groups (Pernice-Duca, 2010).

Distinct Measures of Social Network Integration

Kornienko and colleagues (2015) discussed the benefits of employing social network analysis when evaluating the impact of peer social networks on adolescent ethnic-racial identity development. They described how a social network could be constructed by either obtaining the perspective of an individual and all individuals connected to them, or by asking all individuals within a specific context to designate their friends. They discuss how social network analysis can determine an individuals' degree of integration by examining an individuals' position within the network and the directionality and pattern of ties (Kornienko et al., 2015). Accordingly, the directionality of the social relations, which refers to the type of relationship held between two connected individuals, can be categorized as reciprocated, incoming, or outgoing (Kornienko et al., 2015). Two individuals who nominate each other as friends are designated as having a reciprocal relationship. Reciprocal ties typically denote a higher quality of friendship. Incoming and outgoing relations are categorized as unilateral, meaning that only one individual nominated another as a friend. In one-sided ties, the individual who reports friendship typically strives to form a reciprocated relationship with the individual of interest by adopting that specific peer's behaviors and attitudes (Prinstein, 2007). The bonds individuals hold with their peers designate their positioning within their social network, which indicates possible social support (Kornienko et al., 2015). Combining reports from different individuals within the studied social network on their affiliations provides researchers with more information regarding positioning and ties between individuals (Kornienko et al., 2015). The pattern of social ties reveals an

individual's relationship preferences regarding with whom they have a relationship and with whom they desire to affiliate (Kornienko & Santos, 2014). Therefore, gaining more information on the social ties within a social network provides researchers with a greater understanding of individuals' relationships with others, integration into their social system, and overall social status (Kornienko et al., 2015).

Walker et al. (1993) state that different aspects of an individuals' social ties, such as their directionality and proximity to others and their networks' density, impact their experience of social support. Thus, while the directionality and proximity of ties may indicate an individuals' level of peer support, the size of one's peer social network reveals their popularity (Walker et al., 1993). However, there is reason to believe that because network size has been found to relate to social support, peer popularity may also be related to the experience of peer social support (Walker et al., 1993). Walker et al. (1993) argue that these social network characteristics provide researchers with a greater understanding of an individuals' experiences of social support.

Ethnic-Racial Identity Development and Social Integration

Due to the ethnic and racial heterogeneity of the United States, ERI is made more salient and prominent during adolescence, when individuals spend more time developing their social identity (Tajfel, 1974). Youth pay more attention to others, taking more time to notice how people, who are or are not a part of their ethnic-racial group, act towards them. Also, adolescents pay increased attention to how their ethnic-racial group(s) are thought about and treated by society and the different systems created to uphold these beliefs, such as the public-school system (Rock et al., 2011). Thus, adolescence is a stage

of development when individuals learn more about themselves and what it means to be a member of a particular social group (Rock et al., 2011). Peer relationships become an essential arena for ERI development.

Adolescents often engage in discussions with peers regarding race and ethnicity and other topics related to their identity. Thus, the role of peers in ERI development needs to be better understood (Syed & Juan, 2012). Current research shows that one's identity, in general, ERI development, can promote a more positive self-concept and social skills, that in turn would enable them to be more successful in developing and maintaining supportive and positive relationships with peers (Marshall et al., 2014; Hoffman et al., 2019). Additionally, research shows that adolescents select their friends who are similar in ERI centrality. In the context of these friendships, they socialize each other to become similar on ERI centrality (Santos et al., 2017).

Additional research on ethnic-racial centrality and peer relationships has found that African American adolescents who report higher ERI centrality are more likely to be accepted and rated as popular by their African American peers (Rock et al., 2011). Overall, Rock et al. (2011) suggest that ethnic-group culture is related to peer relationships in adolescence.

Hoffman and colleagues (2019) investigated how Black and Latinx adolescents' degree of ethnic-racial centrality concurrently and prospectively impacted their perceptions of academic and emotional peer support. The study explored the progression of peer support throughout early adolescence (Hoffman et al., 2019). The findings suggest that the degree to which an adolescent believes their ethnicity or race is central to

their identity impacts the individual's perception of social support. Thus, when adolescents' centrality is high, their perception of social support progressively decreases throughout early adolescence (Hoffman et al., 2019). Therefore, as Hoffman et al. (2019) state, there is reason to believe that aspects of one's social identity, such as ERI, may influence adolescents' social relationships. However, questions remain regarding the causal relationship between individual characteristics related to ERI development, adolescents' experiences, and perceptions of peer social support (Azmita et al., 2013).

Hoffman et al. (2019) argue that the relationship between individuals' ERI and self-concept is meaningful because individuals who hold a more positive view of themselves are more likely to have positive peer relations and ultimately receive increased peer support (Dekovic & Meeus, 1997; Marshall et al., 2014). Hoffman et al. (2019) draw support for this notion from peer relations theory, which states that an individual's ability to develop and establish social skills and close relationships with peers is related to their perception of themselves (Berndt, 1982). Ultimately, Hoffman et al. (2019) suggest that adolescents with a positive sense of self are more likely to possess highly developed social skills and maintain close relationships with peers. In contrast, adolescents with weaker positive self-concepts are less likely to have advanced social skills and close peer relationships (Brown & Larson, 2009; Dekovic & Meeus, 1997). While this research shows that ERI centrality plays a role in adolescents' social support experiences, it is limited regarding how other aspects of ERI development impact adolescents' experiences with peers. Additional areas of ERI, such as exploration and affirmation, need to be examined to understand its effect on adolescents' experiences of

peer social support. For instance, it could be hypothesized that being high in exploration, which often involves spending more time with people in one's community, could facilitate peer relationships due to shared culture. Therefore, these individuals could experience increased social support. This research underscores that ERI development is likely to be associated with social integration in peer relationships during adolescence.

CHAPTER TWO: THE PRESENT STUDY

The current study examines how ERI exploration, resolution, and affirmation are associated with distinct aspects of social integration measured through several indices of social network integration (i.e., number of mutual friendships, proximity prestige and Bonacich centrality). For the first hypothesis, a positive association between specific aspects of ERI development and social integration was predicted. Furthermore, a stronger association between ERI exploration development and social integration was predicted given that ERI exploration development is other-oriented, which increases the relevance of peers while other aspects of ERI development: ERI resolution and ERI affirmation are more self-focused.

For the second hypothesis, I explored whether these associations between specific aspects of ERI development and measures of social integration differed between early and middle adolescents (sixth- and ninth graders). Age related differences between ERI development and individuals' social experiences have been documented. Longitudinal research studies have demonstrated that for most individuals' aspects of ERI development increase from early to middle adolescence (Huang & Stormshak, 2011). Therefore, it was hypothesized that the associations between specific aspects of ERI development and measures of social integration would differ between early and middle adolescents (sixth- and ninth graders).

Finally, for our third hypothesis we explored whether the associations between ERI development and measures of social integration would differ depending on self-

reported ethnicity, which included Hispanic, White, and ‘other’ ethnicity. Research has found ERI development to differ depending on the individual’s ethnicity and minority or majority status within their social network (Umaña-Taylor, 2016). I hypothesized that ethnicity would moderate the relationship between specific aspects of ERI development and social integration. However, given the limited research on the subject, no specific predictions were made regarding how belonging to either Hispanic, White, and ‘other’ ethnicity would impact the relationship between aspects of ERI development and social integration. Furthermore, it is important to note that in this study these relationships were explored in an ethnically and racially diverse sample of early and middle adolescents using multiple regression.

Method

Participants

Participants included a total of 714 sixth graders (N=279) and ninth graders (N=435) students from four public schools located in a Southwestern metropolitan city in the state of Arizona in the United States. The ethnicity of the participants was mostly congruent with the demographics reported by the Arizona public school system (Appendix I: Figure 1). 53% of the participants identified as Hispanic (N=345), 27% identified as White (N=176), 7% identified as Black or African American (N=46), 2% identified as Asian (N=13), another 2% identified as American Indian (N=13), less than 1% identified as Pacific Islander, and less than 1% identified as ‘other’ race/ethnicity. An additional 64 participants did not report on their ethnicity.

For this study, the variable Ethnicity was coded as Hispanic, White, and ‘other.’ Therefore, participants who identified as Black or African American, Asian, American Indian, Pacific Islander or ‘other’ ethnicity were placed into the ‘other’ ethnicity group. While this is not optimal, it was done to improve statistical power. Additionally, compared to Hispanic and White, the ‘other’ ethnicity group represents the participants who make up the ethnic minority in their social network. Past research has noted the importance ethnic-minority and majority status has on one’s ERI development and social experiences. Thus, for this study it was optimal to divide the minority ethnicities into the ‘other’ ethnicity group.

Procedure

Parental consent forms for student participation were sent home in English and Spanish. All students received \$10 for returning their signed parental consents, regardless of their parent's decision to have their child participate in the study. School teachers prompted students to remind their parents to return signed parental consent letters. The researchers expressed their appreciation for the teacher's efforts by giving them \$50, regardless of the number of students who participated. Students were also asked to provide consent before participating in the study.

The assessment took place in December 2019 and early January 2020. Participants completed self-reported questionnaires during their regular school hours over two class periods (approximately 90 minutes in total). School staff and research project assistants answered any questions as participants completed the surveys.

Measures

Ethnic-Racial Identity (ERI)

To measure Ethnic-Racial Identity, participants completed the brief form of the Ethnic Identity Scale (EIS-B), a 9-item version that assesses three aspects of ethnic-racial identity: exploration (3 items), resolution (3 items), and affirmation (3 items; Douglass & Umaña-Taylor, 2015). The brief form of the Ethnic Identity Scale (EIS-B) is a shorter version of the original 17-item Ethnic Identity Scale (EIS). The 17-item Ethnic Identity Scale (EIS) was developed by Umaña-Taylor et al. (2004) and measures three components of ethnic identity: exploration (7 items), resolution (4 items), and affirmation (6 items). In two separate studies, Douglass and Umaña-Taylor (2015) developed The Brief Form of the Ethnic Identity Scale (EIS-B), which contains 9-items, three for each component of ethnic identity. All items selected for the brief version are the same as how they appear in the original version of the scale. Current findings indicate that the EIS-B comparably assesses ethnic-racial identity to the original version of the scale and supports the validity and reliability of the EIS-B (Douglass & Umaña-Taylor, 2015).

Exploration

Exploration was measured as a subscale of the brief form of the Ethnic Identity Scale (EIS-B; Douglass & Umaña-Taylor, 2015). The exploration subscale consists of three items that measure the degree to which individuals have participated in events and activities that have taught them about their ethnicity. Items are rated (1 = "does not describe me at all" to 4 = "describes me pretty well") so that higher scores represent greater ethnic-racial exploration. This includes items such as, "I have attended events that

have helped me learn more about my ethnicity." and "I have participated in activities that have taught me about my ethnicity." The alpha reliability estimate for the sixth grade was 0.718 and 0.798 for the ninth grade.

Resolution

ERI resolution was measured as a subscale of EIS-B (Douglass & Umaña-Taylor, 2015). The resolution subscale consists of three items that measure the degree to which individuals have a sense of what their ethnicity means to them. Items are rated (1 = "Not at all" to 4 = "Very well") so that higher scores represent greater ethnic-racial resolution. This includes items such as, "I know what my ethnicity means to me." and "I am clear about what my ethnicity means to me." The alpha reliability estimate for the sixth grade was 0.855 and 0.885 for the ninth grade.

Affirmation

Affirmation was measured as a subscale of EIS-B (Douglass & Umaña-Taylor, 2015). The affirmation subscale consists of three items that measure the degree to which individuals dislike or feel negatively about their ethnicity. Items are rated (1 = "does not describe me at all" to 4 = "describes me pretty well") and must be reversed so that higher scores represent greater ethnic-racial affirmation. This includes items such as "I dislike my ethnicity." and "I wish I were of a different ethnicity." The alpha reliability estimate for the sixth grade was 0.867 and 0.860 for the ninth grade.

Social Integration and Peer Networks

Social integration was operationally defined as the participant's global centrality, which was constructed through measures of network prestige (Proximity Prestige),

network centrality (Bonacich Centrality), and the number of reciprocal relationships (Wasserman & Faust, 1994). Participants' global centrality was assessed using a friendship network questionnaire. Participants responded to the question: "Please list the names of 10 FRIENDS from your grade, with whom you spend much time doing different activities and whom you can count on when you need help." Participants nominated up to 10 peers of either gender from their grade. Mutual friendship nominations, proximity prestige, and Bonacich centrality were used to construct the participant's social integration within their peer network.

The Number of Mutual Friendship Nominations

The friendship network questionnaire was used to compute a local measure of network centrality based on mutual nominations that captures the number of reciprocal ties an individual possesses within a social network. The number of mutual friendships is a direct measure of individuals dyadic relationships. It was calculated by weighing the incoming ties reported by the individual to the outgoing ties reported by peers within their social network (Wasserman & Faust, 1994).

Proximity Prestige

The friendship network questionnaire was used to compute proximity prestige, a global measure of network prestige based on unilateral incoming tie nominations. It is based on the social network of friendships and thus represents a greater social complexity compared to local measures. Proximity prestige indicates an individuals' degree of popularity and extraversion. Nominations are coded as incoming when peers' participant's prestige was calculated by weighing the participants' nominations of incoming ties

against their peers' nominations of ties within their social network (Wasserman & Faust, 1994). Proximity prestige captures an individual's positioning within their social network through a composite of the closeness and quantity of direct and indirect ties (Kornienko et al., 2015).

Bonacich Centrality

The friendship network questionnaire was used to compute Bonacich centrality, a global measure of network centrality based on outgoing nominations and captures the individual's connectedness within their social network. Bonacich centrality represents greater social complexity and is based on the social network of friendships. The measure captures the indirect and direct relationships of ties within the social network and considers the connectiveness of other's when calculating the connectedness of the individual (Kornienko et al., 2015). It was calculated by weighing the outgoing ties reported by the specific individual against their peers' nominations of ties within their social network (Wasserman & Faust, 1994).

Plan of Analysis

This study strives to understand the relationship between specific aspects of ERI development: exploration, resolution, affirmation, grade, ethnicity, and peer integration by examining three hypotheses. Our first hypothesis is that specific aspects of ERI development: exploration, resolution, and affirmation are related to social integration, measured through the number of mutual friendships, proximity prestige, and Bonacich centrality. A multiple regression will be conducted to examine the amount of variance ERI exploration, ERI resolution, and ERI affirmation independently account for in

mutual friendship nominations. An additional multiple regression will be conducted to examine the amount of variance ERI exploration, ERI resolution, and ERI affirmation independently account for in Bonacich centrality. Also, a multiple regression analysis will be conducted to examine the amount of variance ERI exploration, ERI resolution, and ERI affirmation independently account for in proximity prestige. Gender, grade, and ethnicity will be controlled for throughout the analyses. Additionally, multicollinearity will be tested.

Secondly, I hypothesized that the interactions between ERI exploration and grade, ERI resolution and grade, and ERI affirmation and grade (sixth and ninth) would be independently related to social integration, measured through the number of mutual friends, proximity prestige, and Bonacich centrality. Hierarchical multiple regression will be used to examine how grade (sixth and ninth) moderates the relationship between the different aspects of ERI: exploration, resolution, and affirmation and our measures of social integration: the number of mutual friendships, proximity prestige, and Bonacich centrality.

Our third hypothesis is that ethnicity (White, 'other,' and Hispanic) will moderate the relationship between ERI development and social integration. Three separate hierarchical multiple regression will be run to examine how ethnicity (White, 'other,' and Hispanic) moderates the relationship between ERI exploration, ERI resolution, and ERI affirmation development and measures of social integration: the number of mutual friendships, proximity prestige, and Bonacich centrality.

The following tests were performed to ensure that assumptions of regression were met. Standard residuals were analyzed to identify any outliers, after which six participants needed to be removed. Collinearity tests indicated that multicollinearity was not a concern because all the variable's tolerance levels were greater than .10, and the VIF for all variables was less than five. The data met the assumption of independent errors (Durbin-Watson value = 1.25). The histogram of standardized residuals indicated that the data contained approximately customarily distributed errors, as did the normal P-plot of standardized residuals, which showed points that were close to the line. The scatterplot of standardized residuals showed that the data met the assumptions of homogeneity of variance and linearity.

CHAPTER THREE: RESULTS

The current sample consists of 714 (51% female) sixth and ninth graders from four Arizona public schools. Table 1 provides the means, standard deviations, and correlations between grade, gender, ethnicity, ERI exploration, ERI resolution, ERI affirmation, and our measures of social integration: the number of mutual nominations, proximity prestige, and Bonacich centrality.

Grade was found to be significantly and negatively correlated with ERI exploration development (see Table 1): thus, the sixth graders engaged in higher ERI exploration development compared to the ninth-grade students. Additionally, grade was significantly and positively related to ERI resolution and ERI affirmation, meaning that ninth-grade students reported greater ethnic-racial resolution and affirmation. This is consistent with past findings regarding the developmental trajectory of ethnic-racial identity development, which states that as adolescents age, specific aspects of their ethnic-racial identity develop (Huang & Stormshak, 2011).

Grade was also significantly and negatively correlated to the number of mutual nominations and proximity prestige, which indicates that sixth-grade students experienced a higher number of mutual friendship nominations and more incoming nominations from peers than ninth-grade students. Thus, sixth-grade students were found to display a high degree of popularity and extraversion.

Female students were found to hold more mutual nominations or friendships than their male counterparts. This is consistent with prior research on gender differences in

friendship, which states that adolescent females report having a greater number of friends compared to their male counterparts (Kawachi & Berkman, 2001).

White students reported significantly lower development in ERI exploration, ERI affirmation, and ERI resolution, compared to participants who self-identified as Hispanic, Black or African American, Asian, American Indian, Pacific Islander or ‘other’ ethnicity. Additionally, Hispanic ethnicity significantly and positively correlated with all three aspects of ERI development.

In our sample, ERI exploration was not correlated with any of our measures of social integration. However, ERI resolution, which refers to the degree to which individuals have a sense of what their ethnicity means to them, was significantly and positively related to the number of mutually reported friendships and Bonacich centrality or outgoing ties. ERI affirmation was also significantly and positively correlated with the number of mutual nominations and Bonacich centrality; however, ERI affirmation or the degree to which individuals like or feel positively about their ethnicity was negatively related to proximity prestige. Thus, our data shows that the more incoming ties, which have been found to signal popularity and extraversion (Walker et al., 1993), the less positive individuals felt about their ethnicity.

Overall, these findings suggest that the different aspects of ERI development are correlated with grade, gender, ethnicity (White, ‘other,’ and Hispanic), the number of mutual nominations, proximity prestige, and Bonacich centrality.

Hypothesis 1: Associations between ERI Development and Social Integration

To test our first hypothesis that specific aspects of ERI development: exploration, resolution, affirmation, and grade and gender, are related to social integration, measured through the number of mutual friendships, proximity prestige, and Bonacich centrality, three multivariate regressions were conducted.

ERI Exploration, ERI Resolution, ERI Affirmation and Grade as Predictors of The Number of Mutual Friendships

A regression was conducted to determine the relationship between the predictor variables, grade, gender, ethnicity, ERI exploration, ERI resolution, and ERI affirmation and the outcome variable, the number of mutual friendships (See Table 2). The analysis showed that White ethnicity, 'other' ethnicity, Hispanic ethnicity, and ERI exploration did not significantly predict the number of mutual friendship nominations. The analysis shows that the variables, grade ($\beta = -.12, p = .00$), gender ($\beta = .14, p < .001$), ERI resolution ($\beta = .12, p = .01$), and ERI affirmation ($\beta = .08, p = .04$) significantly predicted the number of mutual friendships.

There was a negative association between grade and the number of mutual friendships, $r = -.09, p = .01$, students in ninth grade reported a lower number of mutual friendships compared to students in sixth grade. There was a positive relationship between gender and the number of mutual friendships, $r = .14, p < .001$, with females reporting more friendships compared to males. There was a positive association between ERI resolution and the number of mutual friendships, $r = .12, p = .002$, thus, as ERI resolution increased so did individual's number of mutual friendships. There was a positive relationship between ERI affirmation and the number of mutual friendships, $r =$

.08, $p = .02$. As an individual's ERI affirmation increased, so did the number of mutual friendships they possessed.

Overall, our model was significant with grade, gender, ethnicity, ERI exploration, ERI resolution, and ERI affirmation explaining a small but significant amount of the variance in the number of mutual friendships held by participants ($F(7, 613) = 4.66, p < .001, R^2 = .05, \text{Adjusted } R^2 = .04$).

ERI Exploration, ERI Resolution, ERI Affirmation and Grade as Predictors of Proximity Prestige

The amount of variance grade, gender, ethnicity, White ethnicity, 'other' ethnicity, Hispanic ethnicity, ERI exploration, ERI resolution, and ERI affirmation account for in proximity prestige was investigated using regression. The analysis showed that gender, White ethnicity, 'other' ethnicity, Hispanic ethnicity, ERI exploration, ERI resolution, and ERI affirmation did not significantly predict proximity prestige.

However, grade level (sixth or ninth) did significantly predict proximity prestige ($\beta = -.26, p < .001$). There was a negative association between the grade and proximity prestige, $r = -.27, p < .001$; therefore, students in ninth grade reported lower proximity prestige compared to students in sixth grade.

Overall, the model was significant with ERI exploration, ERI resolution, ERI affirmation, gender, and grade explaining a small, but significant amount of the variance in proximity prestige ($F(7, 613) = 7.64, p < .001, R^2 = .08, \text{Adjusted } R^2 = .07$).

ERI Exploration, ERI Resolution, ERI Affirmation and Grade as Predictors of Bonacich Centrality

A regression analysis was used to determine whether variance in grade, gender, White ethnicity, 'other' ethnicity, Hispanic ethnicity, ERI exploration, ERI resolution, and ERI affirmation account for variance in Bonacich Centrality. The analysis shows that grade, White ethnicity, 'other' ethnicity, Hispanic ethnicity, ERI exploration, and ERI affirmation did not significantly predict Bonacich centrality.

However, gender ($\beta = .08, p = .04$) and ERI resolution ($\beta = .16, p < .001$) did significantly predict Bonacich Centrality. Gender, $r = .08, p = .02$ was positively associated with Bonacich centrality; thus, female students reported a higher number of outgoing ties compared to male students. ERI resolution, $r = .17, p < .001$ was also positively associated with Bonacich centrality, which meant that as ERI resolution development increased, so did Bonacich centrality or the number of outgoing nominations an individual held.

Overall, our model was significant with grade, gender, ethnicity, ERI exploration, ERI resolution, and ERI affirmation explaining a small but statistically significant amount of the variance in Bonacich centrality ($F(7, 613) = 3.93, p < .001, R^2 = .04$, Adjusted $R^2 = .03$).

Hypothesis 2: Grade as a Moderator of the Association Between ERI Development and Social Integration

For our second hypothesis, a hierarchical multiple regression was conducted to understand the impact of grade (sixth or ninth) on the relationship between ERI development (exploration, resolution, and affirmation) and social integration (the number

of mutual friendships, proximity prestige, and Bonacich centrality). The variable grade was coded with sixth grade as 0 and ninth grade as 1.

Grade as a Moderator of Association Between ERI Development and The Number of Mutual Friendship Nominations

A two-stage hierarchical multiple regression was conducted to determine if the addition of the interaction between the different facets of ERI development (ERI exploration, ERI resolution, and ERI affirmation) and participant's grade (sixth or ninth) improved the prediction of the number of mutual friendships reported. The variables grade, gender, Hispanic ethnicity, other ethnicity, ERI exploration, ERI resolution, and ERI affirmation were entered at stage one of the regression. The interactions between ERI exploration development and grade level, ERI resolution development and grade level, and ERI affirmation development and grade level were entered in stage two. Intercorrelations between the multiple regression variables were reported in Table 1 and the regression statistics are in Table 3.

The hierarchical multiple regression revealed that at stage one, grade, gender, Hispanic ethnicity, other ethnicity, ERI exploration, ERI resolution, and ERI affirmation contributed significantly to the regression model, $F(7, 613) = 4.66, p < .001$ and accounted for 5.1% of the variation in the number of mutual friendships reported. Introducing the interaction variables explained an additional 1.0% of variation in the number of mutual friendships and this change in R^2 was not significant, $F(10, 610) = 3.84, p < .001$. The addition of the interaction variables did not lead to a statistically significant increase in R^2 of .01, $\Delta F(3, 610) = 1.87, P = .13$. Therefore, we did not find

ethnicity (Hispanic and other) to significantly moderate the relationship between the different facets of ERI development (ERI exploration, ERI resolution, and ERI affirmation) and the number of mutual friendships reported.

A significant interaction was found regarding the moderating effect of grade on the relationship between ERI resolution development and the number of mutual friendships reported. Further analysis was conducted to explore this significant interaction. A simple slope analysis revealed that for both sixth and ninth grade students, the number of mutual friendships reported was positively related to their degree of ERI resolution development (Appendix J: Figure 2).

Particularly for participants who were in sixth grade, as their degree of ERI resolution development increased, their number of mutual friendship nominations increased, much steeper than the rate for 9th grade students. Therefore, grade significantly moderated the relationship between the degree of ERI resolution development and the number of mutual friendships. Overall, these findings demonstrate the significant impact individual's grade has on their social experiences with peers and their degree of ERI exploration development.

Grade as a Moderator of Association Between ERI Development and Proximity Prestige

A two-stage hierarchical multiple regression was conducted to determine if the addition of the interaction between the different facets of ERI development (ERI exploration, ERI resolution, and ERI affirmation) and participant's grade (sixth or ninth) improved the prediction of the number of incoming ties or proximity prestige. The

variables grade, gender, Hispanic ethnicity, other ethnicity, ERI exploration, ERI resolution, and ERI affirmation were entered at stage one of the regression. The interactions between ERI exploration development and grade level, ERI resolution development and grade level, and ERI affirmation development and grade level were entered in stage two. Intercorrelations between the multiple regression variables were reported in Table 1 and the regression statistics are in Table 4.

The hierarchical multiple regression revealed that at stage one, grade, gender, Hispanic ethnicity, other ethnicity, ERI exploration, ERI resolution, and ERI affirmation contributed significantly to the regression model, $F(7, 613) = 7.64, p < .001$ and accounted for 8.0% of the variation in proximity prestige. Introducing the interaction variables explained an additional .30% of variation in the number of mutual friendships and this change in R^2 was not significant, $F(10, 610) = 5.55, p < .001$. The addition of the interaction variables did not lead to a statistically significant increase in R^2 of .00, $\Delta F(3, 610) = .70, P = .56$. Therefore, we did not find grade (sixth or ninth) to significantly moderate the relationship between the different facets of ERI development (ERI exploration, ERI resolution, and ERI affirmation) and proximity prestige or the number of incoming ties.

Grade as a Moderator of Association Between ERI Development and Bonacich Centrality

A two-stage hierarchical multiple regression was conducted to determine if the addition of the interaction between the different facets of ERI development (ERI exploration, ERI resolution, and ERI affirmation) and participant's grade (sixth or ninth)

improved the prediction of Bonacich Centrality or the number of outgoing ties. The variables grade, gender, Hispanic ethnicity, other ethnicity, ERI exploration, ERI resolution, and ERI affirmation were entered at stage one of the regression. The interactions between ERI exploration development and grade level, ERI resolution development and grade level, and ERI affirmation development and grade level were entered in stage two. Intercorrelations between the multiple regression variables were reported in Table 1 and the regression statistics are in Table 5.

The hierarchical multiple regression revealed that at stage one, grade, gender, Hispanic ethnicity, other ethnicity, ERI exploration, ERI resolution, and ERI affirmation contributed significantly to the regression model, $F(7, 613) = 3.93, p < .001$ and accounted for 4.30% of the variation in Bonacich centrality. Introducing the interaction variables explained an additional .40% of variation in the number of mutual friendships and this change in R^2 was not significant, $F(10, 610) = 3.04, p < .001$. The addition of the interaction variables did not lead to a statistically significant increase in R^2 of .00, $\Delta F(3, 610) = .41, P = .41$. Therefore, we did not find grade (sixth or ninth) to significantly moderate the relationship between the different facets of ERI development (ERI exploration, ERI resolution, and ERI affirmation) and Bonacich centrality or the number of outgoing ties.

Hypothesis 3: Ethnicity as a Moderator of Association Between ERI Development and Social Integration

Hierarchical multiple regression was used to test the third hypothesis that ethnicity, White, 'other,' and Hispanic, moderated the relationship between ERI

development and social integration. White encompassed participants who self-identified as White ethnicity. ‘Other’ was comprised of participants who self-identified as Black or African American, Asian, American Indian, Pacific Islander or ‘other’ ethnicity. Lastly, Hispanic included participants who self-identified as Hispanic. The variable ethnicity was dummy coded with White as the reference group.

Ethnicity as a Moderator of Association Between ERI Development and The Number of Mutual Friendship Nominations

A two-stage hierarchical multiple regression was conducted to determine if the addition of the interaction between the different facets of ERI development (ERI exploration, ERI resolution, and ERI affirmation) and ethnicity (Hispanic and other, which included participants who self-identified as Black or African American, Asian, American Indian, Pacific Islander or ‘other’ ethnicity) improved the prediction of the number of mutual friendships reported (see Table 6). The variables grade, gender, Hispanic ethnicity, other ethnicity, ERI exploration, ERI resolution, and ERI affirmation were entered at stage one of the regression. The interactions between ERI exploration development and Hispanic ethnicity, ERI resolution development and Hispanic ethnicity, ERI affirmation development and Hispanic ethnicity, ERI exploration development and other ethnicity, ERI resolution development and other ethnicity, and ERI affirmation development and other ethnicity were entered in stage two. Intercorrelations between the multiple regression variables were reported in Table 1 and the regression statistics are in Table 6.

The hierarchical multiple regression revealed that at stage one, grade, gender, Hispanic ethnicity, other ethnicity, ERI exploration, ERI resolution, and ERI affirmation contributed significantly to the regression model, $F(7, 613) = 4.66, p < .001$ and accounted for 5.1% of the variation in the number of mutual friendships reported. Introducing the interaction variables explained an additional 1.2% of variation in the number of mutual friendships and this change in R^2 was not significant, $F(13, 607) = 3.10, p < .001$. The addition of the interaction variables did not lead to a statistically significant increase in R^2 of .01, $\Delta F(6, 607) = 1.26, P = .28$. Therefore, we did not find ethnicity (Hispanic and other) to significantly moderate the relationship between the different facets of ERI development (ERI exploration, ERI resolution, and ERI affirmation) and the number of mutual friendships reported.

A significant interaction was found regarding the moderating effect of ethnicity on the relationship between ERI exploration development and the number of mutual friendships reported. Further analysis was conducted to explore this significant interaction. A simple slope analysis revealed that only for participants who identified as Hispanic, the number of mutual friendships reported was positively related to their degree of ERI exploration development (Appendix K: Figure 3). For the other two groups (white, other), there was a negative relationship between ERI exploration and number of mutual friendships.

Thus, for Hispanic participants as the number of mutual friendships reported increased, the degree of ERI exploration development increased, meaning that Hispanic participants held more mutual friendship nominations when they had a higher degree of ERI

exploration development. Overall, these findings demonstrate the significant impact individual's ethnicity has on their social experiences with peers and their degree of ERI exploration development.

Ethnicity as a Moderator of Association Between ERI Development and Proximity Prestige

A two-stage hierarchical multiple regression was conducted to determine if the addition of the interaction between the different facets of ERI development (ERI exploration, ERI resolution, and ERI affirmation) and ethnicity (Hispanic and other, which included participants who self-identified as Black or African American, Asian, American Indian, Pacific Islander or 'other' ethnicity) improved the prediction of proximity prestige or the number of incoming ties. The variables grade, gender, Hispanic ethnicity, other ethnicity, ERI exploration, ERI resolution, and ERI affirmation were entered at stage one of the regression. The interactions between ERI exploration development and Hispanic ethnicity, ERI resolution development and Hispanic ethnicity, ERI affirmation development and Hispanic ethnicity, ERI exploration development and other ethnicity, ERI resolution development and other ethnicity, and ERI affirmation development and other ethnicity were entered in stage two. Intercorrelations between the multiple regression variables were reported in Table 1 and the regression statistics are in Table 7.

The hierarchical multiple regression revealed that at stage one, grade, gender, Hispanic ethnicity, other ethnicity, ERI exploration, ERI resolution, and ERI affirmation contributed significantly to the regression model, $F(7, 613) = 7.64, p < .001$ and

accounted for 8.0% of the variation in proximity prestige. Introducing the interaction variables explained an additional 1.0% of variation in proximity prestige, $F(13, 607) = 4.60, p < .001$. The addition of the interaction variables did not lead to a statistically significant increase in R^2 of .01, $\Delta F(6, 607) = 1.06, P = .39$. Therefore, we did not find ethnicity (Hispanic and other) to significantly moderate the relationship between the different facets of ERI development (ERI exploration, ERI resolution, and ERI affirmation) and proximity prestige or the number of incoming ties.

A significant interaction was found regarding the moderating effect of ethnicity on the relationship between ERI Resolution development and the proximity prestige. Further analysis was conducted to explore this significant interaction. A simple slope analysis revealed that for participants who identified as ‘other’ ethnicity, the number of incoming ties was negatively related to their degree of ERI resolution development (Appendix L: Figure 4).

Thus, for participants who identified as ‘other’ ethnicity as the number of incoming ties increased, the degree of ERI resolution development decreased, meaning that ‘other’ ethnicity participants had a higher proximity prestige when they had a lower degree of ERI resolution development. Overall, these findings demonstrate the significant impact individual’s ethnicity has on their social experiences with peers and their degree of ERI resolution development.

Ethnicity as a Moderator of Association Between ERI Development and Bonacich Centrality

A two-stage hierarchical multiple regression was conducted to determine if the addition of the interaction between the different facets of ERI development (ERI exploration, ERI resolution, and ERI affirmation) and ethnicity (Hispanic and other, which included participants who self-identified as Black or African American, Asian, American Indian, Pacific Islander or ‘other’ ethnicity) improved the prediction of Bonacich centrality or the number of outgoing ties. The variables grade, gender, Hispanic ethnicity, other ethnicity, ERI exploration, ERI resolution, and ERI affirmation were entered at stage one of the regression. The interactions between ERI exploration development and Hispanic ethnicity, ERI resolution development and Hispanic ethnicity, ERI affirmation development and Hispanic ethnicity, ERI exploration development and other ethnicity, ERI resolution development and other ethnicity, and ERI affirmation development and other ethnicity were entered in stage two. Intercorrelations between the multiple regression variables were reported in Table 1 and the regression statistics are in Table 8.

The hierarchical multiple regression revealed that at stage one, grade, gender, Hispanic ethnicity, other ethnicity, ERI exploration, ERI resolution, and ERI affirmation contributed significantly to the regression model, $F(7, 613) = 3.93, p < .001$ and accounted for 4.3% of the variation in Bonacich centrality. Introducing the interaction variables explained an additional 1.4% of variation in Bonacich centrality, $F(13, 607) = 2.83, p < .001$. The addition of the interaction variables did not lead to a statistically significant increase in R^2 of .01, $\Delta F(6, 607) = 1.53, P = .17$. Therefore, we did not find ethnicity (Hispanic and other) to significantly moderate the relationship between the

different facets of ERI development (ERI exploration, ERI resolution, and ERI affirmation) and Bonacich centrality or the number of outgoing ties.

A significant interaction was found regarding the moderating effect of ‘other’ ethnicity on the relationship between ERI resolution development and Bonacich centrality. Further analysis was conducted to explore this significant interaction. A simple slope analysis revealed that for participants who identified as ‘other’ ethnicity the number of outgoing ties reported was negatively related to their degree of ERI resolution development (Appendix M: Figure 5).

Thus, for participants who identified as ‘other’ ethnicity, as the number of outgoing friendship ties reported increased, their degree of ERI resolution development decreased, meaning that these participants reported more outgoing friendship nominations when they had a lower degree of ERI resolution development. Overall, these findings demonstrate the significant impact individual’s ethnicity has on their social experiences with peers and their degree of ERI resolution development.

CHAPTER FOUR: DISCUSSION

The present study examined the association between specific aspects of ERI development and measures of friendship network integration as captured by social network analysis (SNA) in a sample of ethnically-racially diverse youth. Additionally, we examined how individual characteristics, such as grade and ethnicity, moderated these relationships. Results for hypothesis one showed that individual characteristics and features of ERI development are distinctly related to our SNA measures of social integration. The number of mutual friendships was positively associated with gender, ERI resolution, and ERI affirmation. The number of mutual friendships was also found to have a negative relationship with grade (sixth or ninth). The variables grade and ERI affirmation were negatively correlated with proximity prestige. Additionally, gender, ERI resolution, and ERI affirmation were positively associated with Bonacich centrality. None of our measures of social integration were found to be related to ERI exploration. For hypothesis two, we found the relationship between ERI resolution development and the number of mutual friendships was stronger for sixth grade students compared to ninth grade students. For hypothesis three, three significant interaction effects were found:

1. The relationship between ERI exploration development and the number of mutual friendships was stronger and positive for participants who identified as Hispanic ethnicity than participants who identified as White or 'other' ethnicity
2. The relationship between ERI resolution development and proximity prestige was stronger and negative for participants who identified as 'other' ethnicity compared to participants who identified as Hispanic or White ethnicity.

3. The relationship between ERI resolution development and Bonacich centrality was stronger and negative for participants who identified as ‘other’ ethnicity compared to participants who identified as Hispanic or White ethnicity.

Together our findings indicate that ERI exploration, ERI resolution, and ERI affirmation are distinctly related to social integration as captured by SNA measures. Additionally, an individual’s ethnicity was found to positively and negatively impact the relationship between ERI development and social integration. These findings advance developmental research by revealing the linkages between distinct aspects of ERI development on adolescents’ peer social networks in school settings.

Grade as a Moderator of the Association between ERI and Social Integration

Participants' grade was found to significantly moderate the relationship between ERI resolution development and the number of mutual friendships. The simple slope analysis revealed that for both sixth and ninth-grade students, the number of mutual friendships reported was positively related to their degree of ERI resolution development. However, this association was stronger for younger adolescents. Subsequently, none of our other regressions involving the moderating effect of grade (sixth or ninth) on the relationship between specific aspects of ERI development (exploration, resolution, or affirmation) and social integration (the number of mutual friendships, proximity prestige, and Bonacich centrality) were found to be significant.

In past studies, researchers have found ERI development (Huang & Stormshak, 2011) and social experiences (Johnson, 2004) to positively related to age in adolescent populations. However, our findings regarding the impact of stage of adolescence on the

relationship between ERI development and social integration did not support past findings. It is difficult to discern the reason for this difference due to the lack of prior research regarding the relationship among ERI development, age, and social experiences. Most studies have focused on only two out of these three variables at a time. Therefore, although individuals' ERI development and social experiences separately have both been found to be positively related to age, more studies need to be conducted to examine how all three of these variables are related. Overall, our results showed limited support regarding the how differences stage of adolescents impacts the relationship between aspects of ERI development and social integration.

Ethnicity as a Moderator of the Association between ERI and Social

Integration

We found evidence to support our third hypothesis that ethnicity (White, 'other,' and Hispanic) would moderate the relationship between specific aspects of ERI development (exploration, resolution, and affirmation) and social integration (the number of mutual friendships, proximity prestige, and Bonacich centrality). Results showed three significant interaction effects: (1) The relationship between ERI exploration development and the number of mutual friendships was stronger and positive for participants who identified as Hispanic ethnicity than participants who identified as White or 'other' ethnicity. (2) The relationship between ERI resolution development and proximity prestige was stronger and negative for participants who identified as 'other' ethnicity compared to participants who identified as Hispanic or White ethnicity. (3) The relationship between ERI resolution development and Bonacich centrality was stronger

and negative for participants who identified as ‘other’ ethnicity compared to participants who identified as Hispanic or White ethnicity.

Over 50% of our participants identified as ethnically Hispanic. Additionally, less than 15% of our sample identified as an ethnicity other than White or Hispanic.

Therefore, Hispanic ethnicity represented the numeric majority of students in this sample, while ‘other’ ethnicity represented the numeric minority. Ethnic minority and majority standing have been found to impact adolescent ERI development and social experiences with peers (Umaña-Taylor et al., 2014).

For participants who identified as Hispanic/Latino, ERI exploration, or how often an individual had participated in events and activities related to their ethnicity development, was positively associated with the number of reciprocal friends. Therefore, Hispanic youth held more mutual friendship nominations when displaying higher degrees of ERI exploration. In contrast, White and 'other' ethnicity youth who reported higher degrees of ERI exploration possessed fewer mutual friendships.

There is a known reciprocal relationship between ERI exploration and adolescent peer relationships. Individuals choose friends based on similar degrees of ERI development, and adolescents' friendships influence their ERI development (Rivas-Drake et al., 2017). Samter and colleagues' study on ethnicity and emotional support in same-sex friendships (1997) indicates that friendship varies depending on ethnicity, which is consistent with our findings that ethnicity is associated with individuals' experiences of mutual friendships. Overall, these findings demonstrate the significant impact individual's

ethnicity has on their social experiences with peers and their degree of ERI exploration development.

Over 50% of our sample self-identified as Hispanic ethnicity. Overall, suggesting that adolescents in this study regularly interact with and are surrounded by peers who identify as Hispanic. Feld (1981) 's research suggests that ethnically homogenous individuals occupy similar spaces, facilitating opportunities to meet, interact, and form relationships. In our sample, more individuals within the peer social network identify as Hispanic compared to individuals identifying as White or 'other' ethnicity. This might create a more Hispanic-salient context which allows for a higher number of same-group friendships to form; these types of relationships are of higher quality and more intimate (Block & Grund, 2014).

Essentially, 80% of our participants identified as either White or Hispanic; thus, individuals in the 'other' ethnicity group are the numeric minority within their peer social network. This information is critical because our results found that for participants who identified as 'other' ethnicity representing the sample's ethnic minority, there was a negative and significant moderating effect on the association between ERI resolution and proximity prestige and the relationship between ERI resolution and Bonacich centrality. The significant interactions indicate that for participants in the 'other' ethnicity group, the amount of clarity regarding the meaning of their ethnicity is negatively related to their degree of proximity prestige, which represents incoming ties, and Bonacich centrality, which represents outgoing ties. This means that for participants who identified as belonging to the ethnic minority in their social network and most likely their larger

community, having a more developed ethnic racial identity denoted their social integration within their peer social network.

It is essential to consider contextual demographics when discussing the study's findings regarding the impact of ethnicity on the relationship between ERI development and social integration. Research has shown how belonging to the ethnic and racial minority or majority groups in the United States influences an individual's ERI development and social experiences. However, the ERI development and social experiences of adolescents also vary due to the ethnic-racial composition of their school, community, and state.

Although Hispanic students may be the ethnic-racial minority in other schools and communities within the United States, they represent the numeric majority in our sample and the Arizona public school system. Therefore, the fact that the school and community context in which our sample is embedded is majority Hispanic informs our findings. Overall, adolescents having a more developed ethnic-racial identity can either help or hurt their social integration within their social network, depending on whether they belong to the ethnic minority or the majority of their social network. This supports past research, which suggests that for individuals belonging to an ethnic minority, a higher degree of ERI resolution development can lead to increased salience or awareness of their ethnic minority status. The increased knowledge of one's outer-group status often causes adolescents to feel more isolated from peers and subjects them to acts of discrimination, hostility, and marginalization (Umaña-Taylor et al., 2014). As a result, adolescents belonging to the ethnic minority, who are more resolved in their ethnicity, report fewer

outgoing ties and receive fewer incoming tie nominations compared to their counterparts who belong to the ethnic majority. Overall, suggesting that for students belonging to the ethnic minority, increased ERI development decreased their popularity and positioning within their social network. Research has demonstrated identity's fluidity and how ERI development aspects, such as exploration and centrality, are contextually sensitive (Williams et al., 2018). Therefore, to understand our results, we need to account for the contextual characteristics of ethnicity and race, school, and the geographical area composition, in which our sample is embedded. The ethnic-racial composition of our participants, which shows that most students identify as Hispanic, mirrors the ethnic characteristics of the Arizona public school system. Way and colleagues (2008) account for context by conducting longitudinal and mixed-methods studies on racial and ethnic identity development. Here, they found racial and ethnic identity to have a complex relationship with context (Way et al., 2008). Ethnic minority and majority status are related to context; thus, it is essential to consider the contextual demographics of the school and community when interpreting findings related to ethnicity.

CHAPTER FIVE: LIMITATIONS AND FUTURE DIRECTIONS

Ethnic-racial identity is a complex and multifaceted construct central to the normative development of ethnic and racial minority youth (Rivas-Drake et al., 2014). Research on ethnic and racial identity has continued to increase. However, we need to continue to examine how ERI development relates to individual differences and social experiences (Williams et al., 2018). In the current study, we examined the association between ERI development and social integration along with how individual differences might influence this relationship.

A significant limitation of this study is our formation of the variable ethnicity. In this study, when participants were asked to self-report their ethnicity, they were given the choices of White, Black or African American, Hispanic, Asian, American Indian, Pacific Islander, or 'other' ethnicity. It is essential to consider if these terms are equivalent in meaning or if they are being incorrectly used. For instance, an individual could identify as both Black and Hispanic. Furthermore, this lack of clarity regarding how this study conceptualized ethnicity is especially concerning, given that 64 participants left this question blank. This lack of clarity is not limited to our work. Across research and society, these terms are used in various ways to characterize groups of people. However, many agree that there is a need to clarify the conceptualization of ethnicity and race within research (Williams et al., 2018). Future work examining race and ethnicity needs to carefully consider how they conceptualize these terms and how the participants define race and ethnicity to avoid confusion and provide more accurate results.

Additionally, it is apparent that in ERI development research, terms are often defined differently depending on the study. While there is some consistency across the literature, the components of ERI development differ depending on the measure employed. For instance, while we used the brief form of the Ethnic Identity Scale (EIS-B) to assess three aspects of ERI development, other studies have used The Multigroup Ethnic Identity Measure (MEIM; Phinney, 1992) that taps into *process components* of ERI or the Multidimensional Model of Racial Identity (MMRI; Sellers et al., 1998) to measure *content components* of ethnic-racial identity. This difference is significant because some of these measures, such as the MMRI, have been developed to be used with a particular ethnic group and measuring content of ERI (ie, centrality, public regard, and private regard), highlighting a common feature in ethnic and racial development research where only peoples from a single ethnic group are included (Williams et al., 2018). In contrast, our work explores more general process-oriented aspects of ERI development in individuals of various ethnicities. Therefore, we must consider how ethnic and racial identity is measured when discussing how our results relate to past findings. Moreover, this raises questions regarding if researchers should focus on one ethnic and racial homogenous population at a time and what is gained or lost when approaching ERI development research in heterogeneous and homogeneous samples.

In ERI development and any developmental research, it is essential to note the context in which the participants are and the setting of the study—especially considering the significant implications ethnic minority and majority status, based on an individual's social network, had on the relationship between ERI development and social integration

in our study. Due to the importance the ethnic demographics of the surrounding individuals have on understanding findings, it is a limitation of this study that we do not know the ethnic-racial composition of the staff members and schools from which our sample derives. Therefore, future work must strive to collect information regarding the ethnic-racial identities of the staff and other students in the school to better understand the impact of minority and majority status on adolescents' development and social experiences. Specifically, given the implications of our findings, research should be done to examine the relationship between ERI exploration development and ERI resolution and social integration in individuals belonging to ethnic minority and majority groups.

Additionally, given our findings related to the relationships among an individual's ERI development, ethnicity, and social integration, future research needs to examine how aspects of ERI development are associated with the ethnic-racial composition of friends and how ethnicity impacts the structure of peer social networks in adolescence. Decisions regarding the statistical methods employed to analyze the data that were made to prevent over-parameterization limited the amount of information gained in the study.

Furthermore, few studies have investigated the relationship between ERI development and peer social networks using social network analysis to measure social integration. Kornienko and colleagues (2015) used data from peer friendship nominations and ERI centrality surveys to promote the theoretical and procedural benefits of using social network analysis (SNA) in ERI research. We chose to employ social network analysis (SNA) to measure adolescents' degree of social integration in our study. We examined the relationship between how ERI exploration, ERI resolution, and ERI

affirmation and measures of social ties: the number of mutual tie nominations, incoming tie nominations, and outgoing tie nominations. Our study provides insights regarding the promotive features of ERI exploration on individuals' positioning within their peer social network. Future researchers should conduct longitudinal studies employing social network analysis and measures of ERI development to better understand how their relationship changes over time and to examine selection and social influence dynamics in social networks (Kornienko et al., 2015).

In research it is essential to reflect on limitations and consider future improvements. There are decisions made regarding the relationships explored, hypotheses made, characteristics of the participants, methods, measures, and analysis done that limit the study's findings. However, given that there is very little research on the relationship among aspects of ERI development, grade, ethnicity, and social network analysis measures, this study aimed to enhance the discussion and provide a framework to inspire future work.

CHAPTER SIX: CONCLUSION

Overall, we found a significant relationship between specific aspects of ERI development and social integration. The number of mutual friendships was positively associated with ERI resolution and ERI affirmation. The variable ERI affirmation was negatively related to proximity prestige. Additionally, ERI resolution and ERI affirmation were positively associated with Bonacich centrality. Additional analyses were used to determine the influence of grade (sixth or ninth) and self-reported ethnicity (White, 'other' race, and Hispanic) on the relationship between aspects of ERI development and social network analysis (SNA) measures of social integration. Four significant interaction effects were found:

1. The relationship between ERI resolution development and the number of mutual friendships was stronger for sixth grade students compared to ninth grade students.
2. The relationship between ERI exploration development and the number of mutual friendships was stronger and positive for participants who identified as Hispanic ethnicity than participants who identified as White or 'other' ethnicity
3. The relationship between ERI resolution development and proximity prestige was stronger and negative for participants who identified as 'other' ethnicity compared to participants who identified as Hispanic or White ethnicity.

4. The relationship between ERI resolution development and Bonacich centrality was stronger and negative for participants who identified as ‘other’ ethnicity compared to participants who identified as Hispanic or White ethnicity.

Overall, our results demonstrate how certain aspects of ERI development are distinctly related to adolescents' reciprocal, incoming, and outgoing tie nominations within their peer network. Additionally, we found that ERI development can promote or impede social network integration for adolescents within a school setting depending on whether the individual belongs to the ethnic minority or majority of their social network, which is beneficial to researchers and educators. Further study is needed to understand how ERI exploration, ERI resolution, and ERI affirmation relate to adolescents' degree of social integration and how individual characteristics impact the relationship.

Appendix A

Table 1

Correlations Between Eight Predictor Variables and Three Measures of Social Integration.

| Variables | <i>M</i> | <i>SD</i> | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|--|----------|-----------|---------|--------|---------|---------|---------|--------|--------|-------|
| 1. Grade | .62 | .49 | | | | | | | | |
| 2. Female | .53 | .52 | .03 | | | | | | | |
| 3. Hispanic | .58 | .49 | -.17*** | .00 | | | | | | |
| 4. other | .12 | .32 | -.05 | .05 | -.43*** | | | | | |
| 5. White | .30 | .46 | .23*** | -.03 | -.78*** | -.24*** | | | | |
| 6. ERI Exploration | 2.18 | .89 | -.1** | .05 | .14*** | .06 | -.19*** | | | |
| 7. ERI Resolution | 3.05 | .84 | .08* | .02 | .06* | .01 | -.07** | .44*** | | |
| 8. ERI Affirmation | 3.67 | .63 | .12** | .01 | .13** | -.02 | -.12* | -.01** | .15*** | |
| Outcome Variables | | | | | | | | | | |
| The Number of Mutual Friendships | 2.16 | 1.70 | -.10** | .14*** | .02 | -.02 | -.01 | .05 | .12** | .08* |
| Proximity Prestige | .28 | .06 | -.27*** | .04 | .05 | .001 | -.05 | .06 | -.05 | -.07* |
| Bonacich Centrality | .89 | .50 | .01 | .08* | .01 | -.04 | .01 | .06 | .17*** | .09* |

Note. M and SD are used to represent mean and standard deviation, respectively.

The variables exploration, resolution, and affirmation were centered to reduce multicollinearity and the variables grade (sixth = 0, ninth = 1), ethnicity (White, other, and Hispanic), and gender (male = 0, female = 1) were dummy coded.

* Indicates $p < .05$. ** indicates $p < .01$. *** indicates $p < .001$.

Appendix B

Table 2

Results from Three OLS Regression Models that Examine ERI Dimensions as Predictors of Multiple Indices of Social Integration.

| Outcome Variable | Predictor Variable | b | SE | β | p-level | 95% CI | |
|----------------------------------|--------------------|------|-----|---------|---------|--------|------|
| | | | | | | LL | UL |
| The Number of Mutual Friendships | (constant) | 2.57 | .25 | | | 2.09 | 3.06 |
| | Grade | -.43 | .14 | -.12** | .00 | -.71 | -.15 |
| | Gender | .47 | .13 | .14*** | <.001 | .21 | .73 |
| | Hispanic | -.14 | .16 | -.04 | .40 | -.45 | .18 |
| | Other | -.25 | .24 | -.05 | .29 | -.72 | .21 |
| | ERI Exploration | .00 | .09 | .00 | .99 | -.17 | .18 |
| | ERI Resolution | .24 | .09 | .12* | .01 | .05 | .42 |
| | ERI Affirmation | .22 | .11 | .08* | .04 | .00 | .44 |
| Proximity Prestige | (constant) | .33 | .01 | | | .31 | .34 |
| | Grade | -.03 | .01 | -.26*** | <.001 | -.04 | -.02 |
| | Gender | .01 | .01 | .04 | .26 | -.00 | .01 |
| | Hispanic | -.00 | .01 | -.01 | .86 | -.01 | .01 |
| | Other | -.00 | .01 | -.02 | .63 | -.02 | .01 |
| | ERI Exploration | .00 | .00 | .07 | .14 | -.00 | .01 |
| | ERI Resolution | -.00 | .00 | -.05 | .22 | -.01 | .00 |
| | ERI Affirmation | -.00 | .00 | -.02 | .64 | -.01 | .01 |
| Bonacich Centrality | (constant) | .87 | .07 | | | .73 | 1.01 |
| | Grade | -.02 | .04 | -.02 | .72 | -.10 | .07 |
| | Gender | .08 | .04 | .08* | .04 | .00 | .16 |
| | Hispanic | -.04 | .05 | -.04 | .42 | -.13 | .05 |
| | Other | -.09 | .07 | -.06 | .19 | -.23 | .04 |
| | ERI Exploration | .00 | .03 | .00 | .99 | -.05 | .05 |
| | ERI Resolution | .10 | .03 | .16*** | <.001 | .05 | .15 |
| | ERI Affirmation | .06 | .03 | .07 | .09 | -.01 | .12 |

Note. M and SD are used to represent mean and standard deviation, respectively. The variables exploration, resolution, and affirmation were centered to reduce multicollinearity and the variables grade (sixth = 0, ninth = 1), ethnicity (White, other, and Hispanic), and gender (male = 0, female = 1) were dummy coded.

* Indicates $p < .05$. ** indicates $p < .01$. *** indicates $p < .001$.

Appendix C

Table 3

Hypothesis 2: Summary of Hierarchical Regression Analysis for Variables Predicting the Number of Mutual Friendship

Nominations.

| Step and Predictor Variable | β | SE | <i>p</i> -level | 95% CI | | R^2 | ΔR^2 | <i>F</i> | ΔF |
|-----------------------------|---------|-----|-----------------|--------|------|-------|--------------|----------|------------|
| | | | | LL | UL | | | | |
| Step 1 | | | | | | .05 | | 4.66*** | |
| Grade | -.12** | .14 | .01 | -.71 | -.15 | | | | |
| Gender | .13*** | .14 | <.001 | .21 | .73 | | | | |
| Hispanic Ethnicity | -.04 | .16 | .40 | -.50 | .18 | | | | |
| Other Ethnicity | -.05 | .24 | .29 | -.72 | .21 | | | | |
| ERI Exploration | .00 | .09 | .99 | -.17 | .18 | | | | |
| ERI Resolution | .12* | .09 | .01 | .05 | .42 | | | | |
| ERI Affirmation | .08 | .11 | .05 | .00 | .44 | | | | |
| Step 2 | | | | | | .06 | .01 | 3.84*** | 1.87 |
| ERI Exploration*Grade | .33 | .19 | .05 | .00 | .73 | | | | |
| ERI Resolution*Grade | -.40* | .20 | .04 | -.79 | -.02 | | | | |
| ERI Affirmation*Grade | .07 | .22 | .74 | -.35 | .49 | | | | |

Note. M and SD are used to represent mean and standard deviation, respectively. The variables exploration, resolution, and affirmation were

centered to reduce multicollinearity and the variables grade (sixth = 0, ninth = 1), ethnicity (White, other, and Hispanic), and gender (male = 0, female = 1) were dummy coded.

* Indicates $p < .05$. ** indicates $p < .01$. *** indicates $p < .001$.

Appendix D

Table 4

Hypothesis 2: Summary of Hierarchical Regression Analysis for Variables Predicting Proximity Prestige.

| Step and Predictor Variable | β | SE | <i>p</i> -level | 95% CI | | R^2 | ΔR^2 | <i>F</i> | ΔF |
|-----------------------------|---------|-----|-----------------|--------|------|-------|--------------|----------|------------|
| | | | | LL | UL | | | | |
| Step 1 | | | | | | .08 | | 7.64*** | |
| Grade | -.26*** | .01 | <.001 | -.04 | -.02 | | | | |
| Gender | .04 | .01 | .26 | -.00 | .01 | | | | |
| Hispanic Ethnicity | -.01 | .01 | .86 | -.01 | .01 | | | | |
| Other Ethnicity | -.02 | .01 | .63 | -.02 | .01 | | | | |
| ERI Exploration | .07 | .00 | .15 | -.00 | .01 | | | | |
| ERI Resolution | -.05 | .00 | .22 | -.01 | .00 | | | | |
| ERI Affirmation | -.02 | .00 | .64 | -.01 | .01 | | | | |
| Step 2 | | | | | | .08 | .00 | 5.55*** | .70 |
| ERI Exploration*Grade | -.22 | .01 | .17 | -.02 | .00 | | | | |
| ERI Resolution*Grade | .12 | .01 | .45 | -.01 | .02 | | | | |
| ERI Affirmation*Grade | -.10 | .01 | .44 | -.02 | .01 | | | | |

Note. M and SD are used to represent mean and standard deviation, respectively. The variables exploration, resolution, and affirmation were centered to reduce multicollinearity and the variables grade (sixth = 0, ninth = 1), ethnicity (White, other, and Hispanic), and gender (male = 0, female = 1) were dummy coded.

* Indicates $p < .05$. ** indicates $p < .01$. *** indicates $p < .001$.

Appendix E

Table 5

Hypothesis 2: Summary of Hierarchical Regression Analysis for Variables Predicting Bonacich Centrality.

| Step and Predictor Variable | β | SE | <i>p-level</i> | 95% CI | | R^2 | ΔR^2 | <i>F</i> | ΔF |
|-----------------------------|---------|-----|----------------|--------|-----|-------|--------------|----------|------------|
| | | | | LL | UL | | | | |
| Step 1 | | | | | | .04 | | 3.93*** | |
| Grade | -.02 | .04 | .72 | -.10 | .07 | | | | |
| Gender | .08* | .04 | .04 | .00 | .15 | | | | |
| Hispanic Ethnicity | -.04 | .05 | .42 | -.13 | .05 | | | | |
| Other Ethnicity | -.06 | .07 | .19 | -.23 | .04 | | | | |
| ERI Exploration | .00 | .03 | .99 | -.05 | .05 | | | | |
| ERI Resolution | .16*** | .03 | <.001 | .05 | .15 | | | | |
| ERI Affirmation | .07 | .03 | .09 | -.01 | .12 | | | | |
| Step 2 | | | | | | .05 | .00 | 3.04*** | 1.00 |
| ERI Exploration*Grade | .22 | .06 | .20 | -.04 | .18 | | | | |
| ERI Resolution*Grade | -.22 | .06 | .18 | -.19 | .04 | | | | |
| ERI Affirmation*Grade | .14 | .06 | .27 | -.06 | .19 | | | | |

Note. M and SD are used to represent mean and standard deviation, respectively. The variables exploration, resolution, and affirmation were centered to reduce multicollinearity and the variables grade (sixth = 0, ninth = 1), ethnicity (White, other, and Hispanic), and gender (male = 0, female = 1) were dummy coded.

* Indicates $p < .05$. ** indicates $p < .01$. *** indicates $p < .001$.

Appendix F

Table 6

Hypothesis 3: Summary of Hierarchical Regression Analysis for Variables Predicting the Number of Mutual Friendship

Nominations.

| Step and Predictor Variable | β | SE | <i>p</i> -level | 95% CI | | R^2 | ΔR^2 | <i>F</i> | ΔF |
|------------------------------------|---------|-----|-----------------|--------|------|-------|--------------|----------|------------|
| | | | | LL | UL | | | | |
| Step 1 | | | | | | .05 | | 4.66*** | |
| Grade | -.12** | .14 | .01 | -.71 | -.15 | | | | |
| Gender | .13*** | .14 | <.001 | .21 | .73 | | | | |
| Hispanic Ethnicity | -.04 | .16 | .40 | -.50 | .18 | | | | |
| Other Ethnicity | -.05 | .24 | .29 | -.72 | .21 | | | | |
| ERI Exploration | .00 | .09 | .99 | -.17 | .18 | | | | |
| ERI Resolution | .12* | .09 | .01 | .05 | .42 | | | | |
| ERI Affirmation | .08 | .11 | .05 | .00 | .44 | | | | |
| Step 2 | | | | | | .06 | .01 | 3.10*** | 4.66 |
| ERI Exploration*Hispanic Ethnicity | .17* | .20 | .03 | .04 | .84 | | | | |
| ERI Resolution*Hispanic Ethnicity | -.02 | .21 | .84 | -.46 | .38 | | | | |
| ERI Affirmation*Hispanic Ethnicity | .02 | .24 | .35 | -.39 | .56 | | | | |
| ERI Exploration*Other Ethnicity | .03 | .29 | .51 | -.43 | .72 | | | | |
| ERI Resolution*Other Ethnicity | -.05 | .30 | .90 | -.87 | .32 | | | | |
| ERI Affirmation*Other Ethnicity | .03 | .35 | .56 | -.49 | .88 | | | | |

Note. M and SD are used to represent mean and standard deviation, respectively. The variables exploration, resolution, and affirmation were

centered to reduce multicollinearity and the variables grade (sixth = 0, ninth = 1), ethnicity (White, other, and Hispanic), and gender (male = 0,

female = 1) were dummy coded.

* Indicates $p < .05$. ** indicates $p < .01$. *** indicates $p < .001$.

Appendix G

Table 7

Hypothesis 3: Summary of Hierarchical Regression Analysis for Variables Predicting Proximity Prestige.

| Step and Predictor Variable | β | SE | <i>p-level</i> | 95% CI | | R^2 | ΔR^2 | <i>F</i> | ΔF |
|------------------------------------|---------|-----|----------------|--------|------|-------|--------------|----------|------------|
| | | | | LL | UL | | | | |
| Step 1 | | | | | | .08 | | 7.64*** | |
| Grade | -.26*** | .01 | <.001 | -.04 | -.02 | | | | |
| Gender | .04 | .01 | .26 | -.00 | .01 | | | | |
| Hispanic Ethnicity | -.01 | .01 | .86 | -.01 | .01 | | | | |
| Other Ethnicity | -.02 | .01 | .63 | -.02 | .01 | | | | |
| ERI Exploration | .07 | .00 | .15 | -.00 | .01 | | | | |
| ERI Resolution | -.05 | .00 | .22 | -.01 | .00 | | | | |
| ERI Affirmation | -.02 | .00 | .64 | -.01 | .01 | | | | |
| Step 2 | | | | | | .09 | .07 | 4.60*** | 1.06 |
| ERI Exploration*Hispanic Ethnicity | .08 | .01 | .27 | -.01 | .02 | | | | |
| ERI Resolution*Hispanic Ethnicity | -.06 | .01 | .45 | -.02 | .01 | | | | |
| ERI Affirmation*Hispanic Ethnicity | -.04 | .01 | .55 | -.02 | .01 | | | | |
| ERI Exploration*Other Ethnicity | .07 | .01 | .22 | -.01 | .03 | | | | |
| ERI Resolution*Other Ethnicity | -.12* | .01 | .04 | -.04 | -.00 | | | | |
| ERI Affirmation*Other Ethnicity | -.02 | .01 | .73 | -.03 | .02 | | | | |

Note. M and SD are used to represent mean and standard deviation, respectively. The variables exploration, resolution, and affirmation were centered to reduce multicollinearity and the variables grade (sixth = 0, ninth = 1), ethnicity (White, other, and Hispanic), and gender (male = 0, female = 1) were dummy coded.

* Indicates $p < .05$. ** indicates $p < .01$. *** indicates $p < .001$.

Appendix H

Table 8

Hypothesis 3: Summary of Hierarchical Regression Analysis for Variables Predicting Bonacich Centrality.

| Step and Predictor Variable | β | SE | <i>p-level</i> | <u>95% CI</u> | | R^2 | ΔR^2 | F | ΔF |
|------------------------------------|---------|-----|----------------|---------------|------|-------|--------------|---------|------------|
| | | | | LL | UL | | | | |
| <i>Step 1</i> | | | | | | .04 | | 3.93*** | |
| Grade | -.02 | .04 | .72 | -.10 | .07 | | | | |
| Gender | .08* | .04 | .04 | .00 | .15 | | | | |
| Hispanic Ethnicity | -.04 | .05 | .42 | -.13 | .05 | | | | |
| Other Ethnicity | -.06 | .07 | .19 | -.23 | .04 | | | | |
| ERI Exploration | .00 | .03 | .99 | -.05 | .05 | | | | |
| ERI Resolution | .16*** | .03 | <.001 | .05 | .15 | | | | |
| ERI Affirmation | .07 | .03 | .09 | -.01 | .12 | | | | |
| <i>Step 2</i> | | | | | | .06 | .01 | 2.83*** | 1.53 |
| ERI Exploration*Hispanic Ethnicity | .08 | .06 | .33 | -.06 | .18 | | | | |
| ERI Resolution*Hispanic Ethnicity | -.08 | .06 | .34 | -.18 | .06 | | | | |
| ERI Affirmation*Hispanic Ethnicity | -.05 | .07 | .38 | -.20 | .08 | | | | |
| ERI Exploration*Other Ethnicity | -.01 | .09 | .84 | -.19 | .15 | | | | |
| ERI Resolution*Other Ethnicity | -.12* | .09 | .04 | -.35 | -.00 | | | | |
| ERI Affirmation*Other Ethnicity | -.02 | .10 | .74 | -.23 | .17 | | | | |

Note. M and SD are used to represent mean and standard deviation, respectively. The variables exploration, resolution, and affirmation were

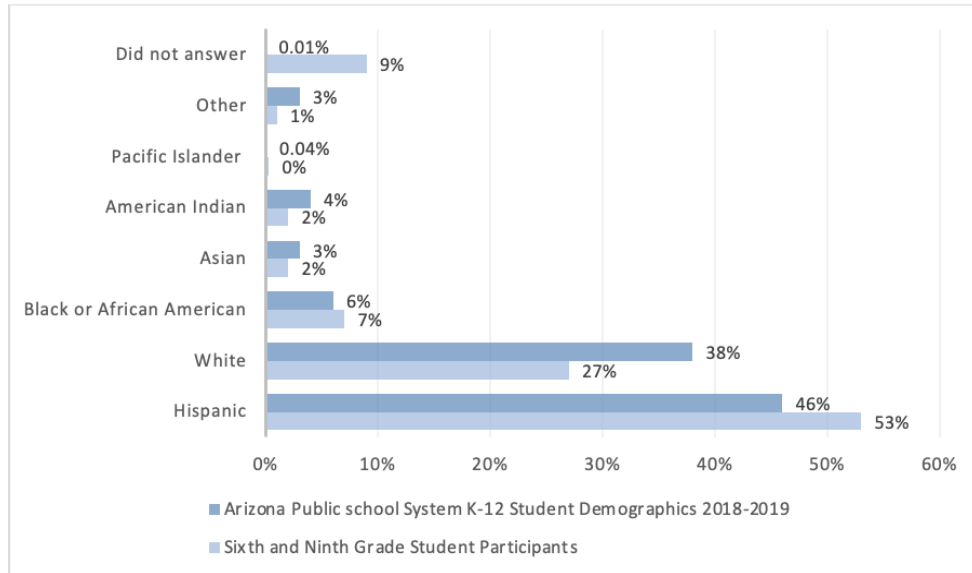
centered to reduce multicollinearity and the variables grade (sixth = 0, ninth = 1), ethnicity (White, other, and Hispanic), and gender (male = 0, female = 1) were dummy coded.

* Indicates $p < .05$. ** indicates $p < .01$. *** indicates $p < .001$.

Appendix I

Figure 1

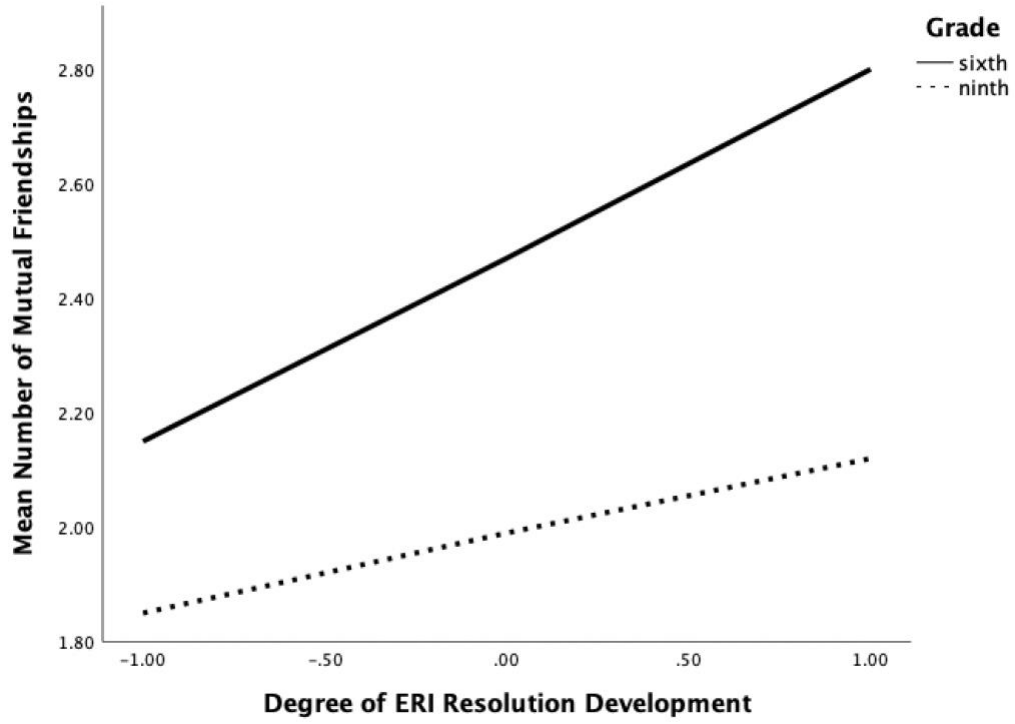
Ethnic demographics of the Arizona public school system and study participants.



Appendix J

Figure 2

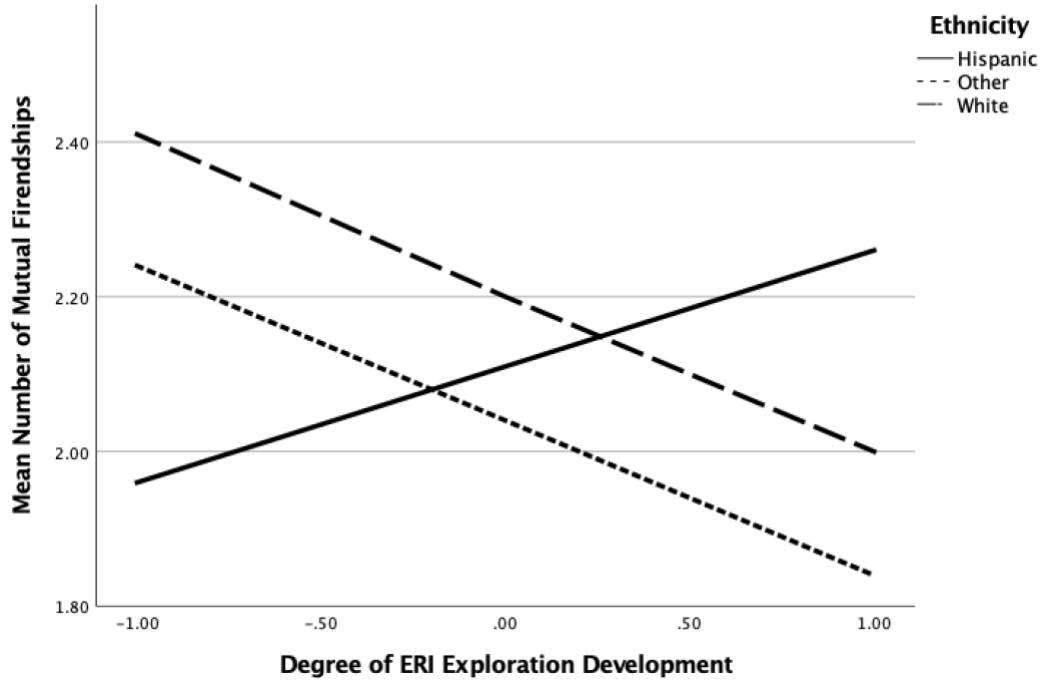
Mean plot illustrating the interaction of ERI resolution and grade.



Appendix K

Figure 3

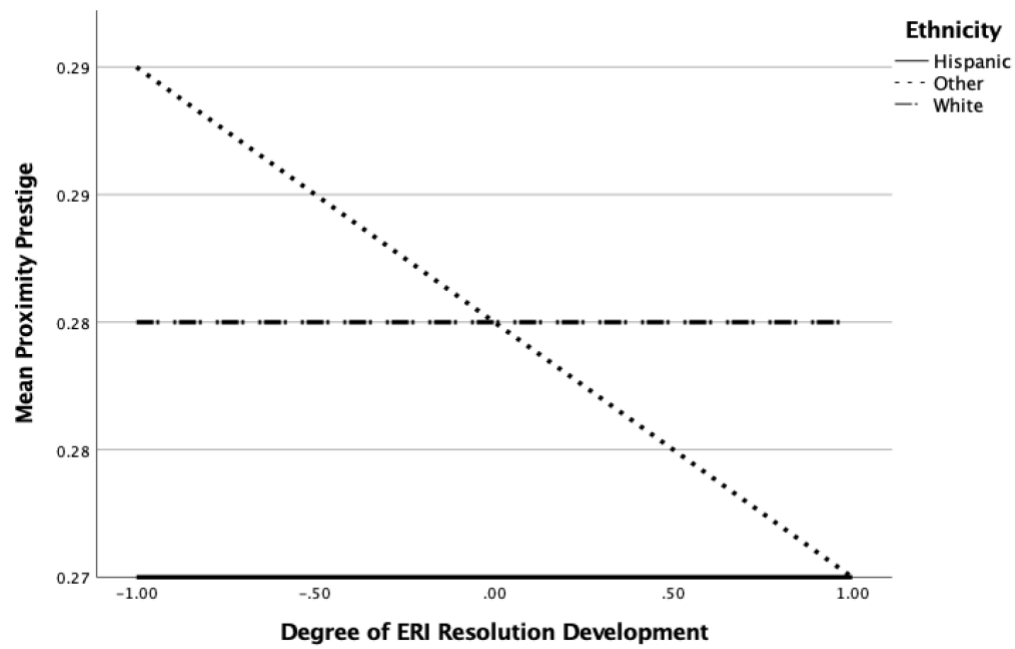
Mean plot illustrating the interaction of ERI exploration development and ethnicity.



Appendix L

Figure 4

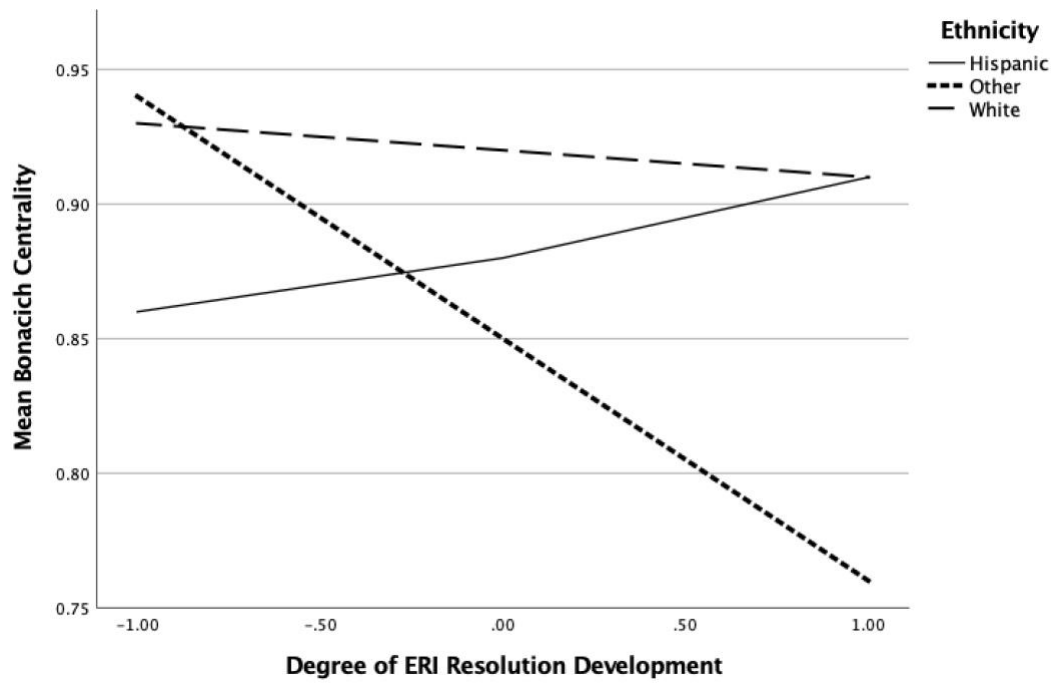
Mean plot illustrating the interaction of ERI resolution development and ethnicity.



Appendix M

Figure 5

Mean plot illustrating the interaction of ERI resolution development and ethnicity.



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BIOGRAPHY

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