

The role of social support among urban migrants in Jordan and Kazakhstan

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Abstract

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Through conceptualizing migration as a social process, this dissertation examines the role of social support among urban migrants. Existing research examining social support is often framed in North American or European contexts and ignores its connectivity with migration or mobility. There remains critical opportunity for research to examine how social support paradigms function in Low and Middle Income Countries (LMICs) and from the perspective of urban migrants, including refugees and economic migrants. By expanding the frame of both migration and social support research, this dissertation endeavors to enrich the empirical knowledge surrounding the role of social support among urban migrants. To accomplish this, this dissertation examines the intersection of trauma, social support, and depression among two urban migrant populations. Through its integration of data from female Syrian refugees in Jordan and male economic migrants in Kazakhstan, this dissertation aims to describe social support, potentially traumatic events (PTEs), and depressive symptomology; identify the direct association of social support and depressive symptomology, and; examine the moderating role of social support on depressive symptomology related to PTEs. This dissertation is guided by the Push-Pull Theory, the Stress-Buffering Hypothesis, and van Brenda's conceptualization of resilience. Findings from this dissertation suggest that social support plays a critical role, both directly and indirectly, in influencing outcomes of depressive symptomology. Findings have several implications for social support measurement and direct practice of mental health clinicians, as well as informing how community-based interventions and mental-health policies within LMICs can integrate social support within their resiliency frameworks.

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Dedication

This dissertation is dedicated to the world's migrants who, by choice or obligation, strive for better lives in new lands.

Introduction

This three-paper dissertation examines the role of social support among two distinct groups of urban migrants from different parts of the globe: female Syrian refugees in Jordan and male economic migrants in Kazakhstan. By focusing on the perceived availability of functional social support (including material aid, emotional care, and information sharing), this dissertation examines both the direct and instrumental ways that functional social support may influence depressive symptomology among urban migrants.

There is a paucity of social support research among migration-affected populations, and the few existing studies often focus around periods of direct migration rather than pre- or post-migration (Hall et al., 2014; Pinto, 2016). The limited post-migration research on this topic tend to concentrate on the influence of structural social support (such as social networks characteristics) on economic outcomes (such as access to employment) (Beaman, 2012; Pinto, 2016; Poros, 2011). The notable gap in migration research on the perceived availability of functional social support is surprising given its researched comparative value on behavioral and health outcomes across a range of populations; non-migrant research demonstrates that social support, particularly functional social support, can modify the influence of stressors, such as Potentially Traumatic Events (PTEs) (Caplan, 1974; Cobb, 1976; Cohen, Underwood, & Gottlieb, 2000a; Cohen & Wills, 1985a).

PTEs, experiences that can result in psychological harm, are likely to be widespread in migratory populations given the variety and severity of potential traumas experienced before, during, and after migration (Boxer & Sloan-Power, 2013; Dubow, Huesmann, & Boxer, 2009; Silove, Sinnerbrink, Field, Manicavasagar, & Steel, 1997b; Silove, Ventevogel, & Rees, 2017; Steel et al., 2009). It is, thus, important to study the role of functional social support among migrants to contribute to the empirical understanding of functional social support's potential moderating role between PTEs and mental health outcomes, as well as to inform future intervention research and social policies tailored to the growing number of migrants in urban settings.

This dissertation uses secondary data from two studies to contribute to the scientific knowledge related to the role of functional social support on depressive symptomology among urban migrants who have experienced a range of PTEs. Two studies are included: 1) Silk Road (PI: Nabila El-Bassel), a longitudinal population-based study of 1,342 market vendors in Almaty, Kazakhstan; and, 2) Women ASPIRE (PIs: Nabila El-Bassel & Neeraj Kaushal), a cross-sectional study in Jordan among 507 Syrian refugee women living outside of refugee camps.

This theoretical framework of this dissertation is guided by the Push-Pull Theory (Lee, 1966), the Stress-Buffering Hypothesis (Cohen & Wills, 1985b), and van Breda's conceptualization of resilience (van Breda, 2018). The Push-Pull Theory proposes that migration decision making is determined through the net of individual push and pull factors associated to the overarching migration process and personal factors. The Stress-Buffering Hypothesis proposes that social support, particularly functional social support, influences outcomes by protecting individuals from the adverse effects of stress, such as PTEs (Caplan, 1974; Cobb, 1976; Cohen, Underwood, & Gottlieb, 2000a; Cohen & Wills, 1985a). The resilience framework

guided the “person-in-environment” interpretation of findings to inform future social support response efforts.

Through examining two groups of urban migrants, this dissertation is designed to:

- 1) Describe functional social support characteristics and classes of urban migrants in Jordan and Kazakhstan, and
- 2) Describe the intersection of functional social support, PTEs, and depressive symptomology among urban migrants in Jordan and Kazakhstan.

The findings from this dissertation have important implications for future research on the influence that social support plays in the migratory process. Moreover, it contributes to the growing body of Mental Health and Psychosocial Support (MHPSS) literature in both development and humanitarian settings. The findings have important implications for mainstreaming social support into practice, policy, intervention, and research related to urban migration, a phenomenon that is increasingly relevant as global displacement becomes more protracted and urbanized.¹

Rationale for the Dissertation

Through conceptualizing migration as a social process, this dissertation examines how social support influences depressive symptomology. Existing research examining social support is often framed in North American or European contexts and too frequently ignores the intersection of migration and social support. Little attention has been given to how social support paradigms function in Low and Middle Income Countries (LMICs) and from the perspective of

¹ Henceforth, the term “social support” in this dissertation represents the perceived availability of functional social support unless otherwise specified.

urban migrants, including refugees and economic migrants. By expanding the frame of both migration and social support research, this dissertation endeavors to enrich the empirical knowledge surrounding the role of social support among urban migrants.

The intersection of mental health, social support, and urban migration

While there is a growing recognition that social isolation is harmful both to individuals experiencing exclusion as well as to society writ large, most countries have not devoted serious resources to addressing this issue [for migrants] – either because it is considered less of a priority than employment or because there is limited evidence on what types of policies and programs work best. And with resources scarce, governments are also struggling to justify costly interventions in the absence of measurable ‘returns’ on these investments.

-Original quote in italics from Migration Policy Institute (Banulescu-Bogdan, 2020)

Migration is a global phenomenon and one that is becoming increasingly urbanized (IOM, 2015; UNHCR, 2018). Concurrent with the increase in urbanization, research and programming for migrants increasingly recognizes that urban migrants have unique needs compared to other migrants (Comission, 2016; Kamal, 2016; Murillo, 2017; Thöne, 2009). In 2014, UNHCR formally committed to pursuing evidence-based research and programming for urban contexts, especially in situations of protracted displacement (2014); thus, signifying an important shift in migration response to focus more intently on the unique and complex needs of urban migrants. Due to their sustained geographical and livelihood linkage to urban environments, many host governments treat refugees and economic migrants as similar groups. Both types of migration are often to urban areas in LMICs, countries that may already struggle to provide services to their citizens.

Migrants experience a range of PTEs, sometimes in relation to migration itself (Boxer & Sloan-Power, 2013; Dubow, Huesmann, & Boxer, 2009; Silove, Sinnerbrink, Field, Manicavasagar, & Steel, 1997b; Silove, Ventevogel, & Rees, 2017; Steel et al., 2009). Before migration, migrants may experience PTEs across the lifecourse (e.g. childhood sexual violence

or neglect). For refugees, pre-migration PTEs may also include the push-factors for migration (incl. conflict-related traumas like bombings or abductions). PTEs experienced during the migratory process can include experiences such as exploitation by officials or bodily harm experienced during physical migration. However, PTEs can also occur after the migration process as host communities may be discriminatory toward migrants (Laruelle, 2008; Yessenova, 2005) or intra-migrant violence (Wachter et al., 2017) may increase. Moreover, women are uniquely vulnerable to PTEs related to gender-based violence (GBV) (Wells, Steel, Abo-Hilal, Hassan, & Lawsin, 2016).

Compounding the challenges associated to PTEs, migrating to a new location alters social support for individuals and communities, as pre-migration social connections become strained during and after migration and new connections form with other migrants or host communities (Alfadhli & Drury, 2016). Migrants are likely have a relatively lower level of social support than prior levels in their area of origin, potentially prompting social isolation. In turn, social support may be a key issue for migrants in regards to integration, behavioral, and health outcomes (Shishehgar, Gholizadeh, DiGiacomo, Green, & Davidson, 2017a). However, the complex mechanisms underlying social support paradigms in migration contexts have not been extensively examined and few studies have considered a strengths based perspective of how social support can mitigate adverse outcomes related to migration and trauma.

While a lack of meaningful and effective social support has been shown to have mental health consequences, including stress, anxiety, and depression among migrants (Shishehgar, Gholizadeh, DiGiacomo, Green, & Davidson, 2017a; Simich, Beiser, & Mawani, 2003; Stewart et al., 2011), studies are limited in examining how migrant populations may express mental health differently and how these outcomes may vary across sociodemographic characteristics

(such as gender or migrant typology). Existing research argues that culturally tailored interventions have the ability to reduce the effects of trauma-induced mental distress (Almedom, 2004); yet, there is less research examining the MHPSS needs of migrant populations and avenues for successful interventions. Despite existing interventions aiming to mitigate adverse mental health outcomes through fostering social support in non-migrant contexts (Cohen, Underwood, & Gottlieb, 2000a), there is a notable gap in research and application of similar or contextualized interventions for migrant populations. By exploring the role of social support, this dissertation seeks to improve the inclusion of social support in future practice, policy, programming, and research for urban migrants.

Scope of the Dissertation

Social support theories informing research aims

The integrated theoretical framework used in this dissertation incorporates the Push-Pull Theory (Lee, 1966), Stress-Buffering Hypothesis (Cohen & Wills, 1985b), and van Breda's conceptualization of resilience (van Breda, 2018). The Push-Pull Theory conceptualizes how factors may influence migrants both in their decision to migrate and their identification of lived traumas (i.e. PTEs). The Stress-Buffering Hypothesis examines how social support can moderate the relationship between PTEs and psychosocial outcomes. Resilience, in turn, outlines the process by which social support can mitigate against adverse outcomes and connect to future interventions and programming for urban migrants.

Building from the few preceding migration theories, the Push-Pull Theory was the first migration theory to consider the breadth of linkages across migration typologies including,

among others, circuitous migration, free migration, forced migration, and internal migration (Lee, 1966). Through providing a more generalized definition of migration – “permanent or semipermanent change of residence” – Lee was able to generalize trends in migration. Central to the Push-Pull Theory are the four factors which influence migration decision making including those related to the place of origin, during migration, and the place of destination, as well as personal factors (Lee, 1966). According to Lee, each of these four factors can be positively (pull) or negatively (push) influence the decision to migrate. The net decision to migration is ultimately determined through individual determination based off the interplay of these factors. Thus, certain factors may carry more weight across different migration typologies. For instance, refugees are likely to experience strong push factors from their place of origin (ex. persecution, violence, deprivation, etc.) which override any counteracting pull factors to remain in their host country. On the other hand, economic migrants may be heavily influenced by pull factors associated to the place of destination (e.g. improved livelihoods) to the extent that push factors in the place of destination (e.g. discrimination, violence, social isolation) do not sway the decision to migrate. Despite the varied motivations of each migrant, the influence of push and pull factors remain.

Stress is a socially embedded concept that is derived from discrete life events or chronic strains that impress upon an individual (Aneshensel, 1992). In the context of migration, for example, stress can arise from violence experienced during migration or familial fractures resulting from migration, as well as acute poverty or host community tensions in areas of relocation. Social resources, particularly social support, can influence throughout the continuum of a PTE and alter the consequences of stress (Cohen, Underwood, & Gottlieb, 2000; Cohen & Wills, 1985b). Given that a single stressor will not have uniform influence across individuals,

this dissertation specifically focuses on how potentially traumatic events (PTEs) influence depression and the moderating role of social support within that framing. PTEs can occur before migration (e.g. witnessing violence, surviving bombings, etc.), throughout physical migration (e.g. family separations, food insecurity, etc.), and post-migration (e.g. stigmatization, unemployment, etc.). This dissertation also considers how other experiences or sociodemographic characteristics may compound or influence the role of stressors (i.e. PTEs).

The Stress-Buffering Hypothesis proposes that social support influences outcomes by protecting individuals from the adverse effects of stress. The formation of the Stress-Buffering Hypothesis was derived from the idea that social support acts as a buffer to mitigate against the effects of stressful life events on health (Cohen & Wills, 1985b). Work from Cutrona and Russel (1990), highlights that specific supportive actions are only useful insofar as they compensate for the stressor. As an example, the influence of social support on depressive outcomes may be negligible in a population with minimal exposure to PTEs. The most notable opposition to the buffer effect was made by Thoits as he asserted the buffering effect is often cofounded and that the notion that support is, in itself, an overlooked etiological factor (Thoits, 1982). Thus, the Direct Effect hypothesizes there is a direct relationship between social support and psychosocial outcomes, while the Buffer Effect focuses on the role of social support on the relationship of stress and psychosocial outcomes. Research in the 1970 and 1980's was split between the two domains, but present day social support research is primarily framed around the role of social support through the Buffer Effect while also examining the Direct Effect. Despite some research conceptualizing the buffering role social support as a mediation, most research incorporates social support as a moderator (under the conceptualization that stress and mental health also have

a direct relationship). While the Stress-Buffering Hypothesis is well researched and also applied to behavioral outcomes, extensions to migration literature is negligible.

An important and missing component of the Stress-Buffering Hypothesis is the interpretation of *why* the moderating role of social support is important. Van Breda's definition of resilience as "[t]he multilevel process that systems engage in to obtain better-than-expected outcomes in the face or wake of adversity" is critical to the interpretation of social support findings from this dissertation (2018). This papers included in this dissertation will focus on how the social system (i.e. social support) functions as a resilience component to combat adversity (i.e. PTE). Counter to van Brenda's position, the papers of this dissertation examine the moderating role of social support rather than its mediating potential as there is little empirical evidence to support the notion that PTEs and directly associated to social support. However, both positions are deeply aligned with the importance of person-in-environment and systems perspectives in the social work profession, rather than explicit focus on the individual. While resiliency research is often framed around "personal agency" (Obschonka, Hahn, & Bajwa, 2018), it should be noted that this dissertation is guided by the belief that resiliency is an individual trait that can be informed through social and behavioral influences, such as the strength of one's social ties. Through examining the role of social support, this dissertation can inform future practices and policies aimed to foster proactive strengthening, rather than reactive restoration, of social support to protect against the adverse influence of stressors, such as PTEs.

Social Support Measurement

Social support can be categorized as functional (ex. the availability or role of ties) or structural (ex. the number of strong or weak ties). This dissertation focuses on functional social

support, due to empirical evidence regarding the comparative influence of functional support over structural social support on outcomes associated to stress (Cohen, Underwood, & Gottlieb, 2000). The perception of available social support, rather than the measurement of received social support, is to be examined within this dissertation. Perceived social support measures how much support is potentially available from existing social ties, while received social support assesses past utilization of support from social ties (Hupcey, 1998). The rationale for including perceived social support is twofold. First, measurement of received social support is biased toward to actual utilization of social support whereby higher utilization of social support would indicate a higher level of social support. As an example, if a man with a strong social support system did not utilize his social support system because there was not a perceived need, this sort of measurement would indicate he had low social support. Beyond the measurement challenges associated to received social support, research has highlighted that there is implicit power in subjective perception rather than actual utilization of social support (Wang, Mann, Lloyd-Evans, Ma, & Johnson, 2018).

Analysis for this dissertation integrates a previously validated social support measures among men in Kazakhstan (Vaglio et al., 2004), as well as operationalizes perceived social support from a range of indicators among women in Jordan. While the indicators are not mirrored, social support in all papers is to be operationalized by the perception of functional social support across five domains identified by Cohen, Underwood, and Gottlieb – emotional support, instrumental support, informational support, companionship support, and validation (S. Cohen, Underwood, & Gottlieb, 2000).

Each paper in this dissertation conceptualizes social support as a latent factor, as well as utilizes the most practical and relevant typology of latent framework analysis to guide the

analytical approach. Inference of construct identification, rather than an explicitly observing the construct, is a key component of a latent framework approach. Thus, the interpretation of this dissertation is guided by a latent framework approach, whereby unobserved constructs are examined (ex. social support) (Bartholomew, Knott, & Moustaki, 2011). Several analytical techniques fall under the umbrella of latent framework, such as this dissertation's use of latent class analysis (LCA), structural equation modeling (SEM), and item response theory (IRT).

Settings for this dissertation

Data from two countries in Asia, Jordan and Kazakhstan, are included in this dissertation. While from varied regions in Asia, both countries are migrant hubs in their respective region. Both countries classified as an "upper middle" country by the World Bank (WorldBank, 2020) and include specific policies for migrants. Kazakhstan is a signatory to the 1951 Refugee Convention, 1967 Refugee Protocol, 2000 Human Trafficking Protocol, and 2000 Migrant Smuggling Protocol (UNICEF). Of the same global policies, Jordan is only a signatory to the 2000 Human Trafficking Protocol (UNICEF). However, Jordan entered into the multi-lateral Jordan Compact agreement in 2016 which was a landmark migrant policy for its explicit focus on sustainable integration of Syrian refugees within the labor force and educational institutions. When comparing net migration, the most recent estimates indicate a positive net migration rate for Kazakhstan (0.4 migrant(s)/1,000 population) and negative net migration rate for Jordan (-11.3 migrant(s)/1,000 population) (CIA). The negative net migration rate for Jordan may be reflective of the increase rate of Syrians returning to Syria, as displacement flows to Jordan have lessened in the past years. However, Jordan still has a high rate of external migrants as its most recent census indicated that 31% of its population is foreign nationals (2,918,125 persons) (De

Bel-Air, 2016). Thus, Jordan is known to be a major migrant-receiving country in the region and the globe.

The first paper examines data collected in Jordan, a country hosting around one million displaced Syrians (UNHCR, 2018). In Jordan, most Syrian refugees live outside of camps in urban centers (84%) (UNHCR, 2019) which aligns with UNHCR's estimation that, on average, over half refugees live in urban areas (2018). Jordan has long hosted forced migrants from neighboring countries, most notably Palestinians and Iraqis. However, Jordan is not a signatory to the 1951 Convention relating to the Status of Refugees. Thus, while Syrians in Jordan are colloquially referred to as "refugees," the government of Jordan does not explicitly accept the refugee designation given by UNHCR to displaced Syrians in Jordan and, instead, uses the term "persons of concern." The lack of legal status, and documentation, in Jordan is one of many challenging factors for Syrian refugees in Jordan. Importantly Syrian refugees often live in poverty (UNHCR, 2015) and experience strains on pre-migration social norms (UN Women, 2018), often occurring in conjunction as economic hardships can challenge social norms around female employment. Researchers have notated the exceptional burden placed on Syrian refugee women in Jordan (UN Women, 2018), as they struggle to maintain household responsibilities while also increasingly encouraged to undertake more economic responsibilities (UN Women, 2017). This challenge, compounded by PTEs experienced across the lifecourse and in relation to migration from Syria, have contributed to a complex situation for Syrian refugee women in Jordan.

The second and third papers examine data collected in Kazakhstan. The economic downfall resulting from the collapse of the former Soviet Union in 1991 contributed to emigration from Tajikistan, Kyrgyzstan, and Uzbekistan to more economically prosperous

neighbors, like Kazakhstan (IOM, 2006). Moreover, interregional migration – a type of internal migration – has been a consistent behavior across Kazakhstan’s history (EBRD, 2010; Wandel & Kazbogarova, 2009). While there is a fairly even rate of male and female immigration (UNICEF), male economic migrants are often drawn to work in large marketplaces, such as Baraholka Market in the city of Almaty. The positive implications of migration on Kazakhstan’s economy has been well researched (Laruelle, 2008), but a more holistic understanding of migration’s implications is less known. Emerging research highlights that all migrant groups in Kazakhstan at an increased risk for discrimination (Laruelle, 2008; Yessenova, 2005); yet, there remains wide opportunities for research to further examine the lived experiences of Kazakhstan’s migrant population and the implications of those experiences are underexamined (El-Bassel et al., 2016).

Data used for this dissertation

This dissertation examines data from economic migrant men in Kazakhstan (Silk Road) and refugee women in Jordan (Women ASPIRE) to examine role of social support, especially on psychosocial outcomes for persons who have experienced a range of PTEs (i.e. the “Buffer Effect”). This dissertation study does not involve the collection of any primary data, as analysis utilizes secondary data from Silk Road and Women ASPIRE. Each set of data are cleaned and no new subjects were recruited. Both studies received approval from the Institutional Review Board (IRB) of Columbia University, as well as in-country ethics committees, to promote protection of human subjects and ensure rigor of the methodologies.

The first paper uses cross-sectional data collected from Women ASPIRE (PIs: Nabila El-Bassel & Neeraj Kaushal), a Jordan-based sexual and reproductive health study among 507

Syrian refugee women living outside of camps and their social networks of women not accessing health services. The study was led by senior faculty and staff at four institutions. Dr. Nabila El-Bassel and Dr. Neeraj Kaushal from Columbia University were the co-PIs with Dr. Anindita Dasgupta as co-investigator. The study was conducted in collaboration with faculty from the medical school at the University of Jordan. Dr. Maysa' Khadra was the in-country PI. Drs. Anindita Dasgupta, Raeda Qutob, Ruba Jaber, and Hana Abu-Hasan were co-investigators. Columbia University Global Center (CUGC) Amman served as Columbia University's local in-country representation in Amman. Participants were recruited from health clinics at the International Rescue Committee (IRC) and the Institute for Family Health (IFH); both are non-governmental organizations, have health clinics across Jordan, and are leaders in health service provision for Syrian refugees in Jordan. This project was a collaboration between faculty from Columbia University School of Social Work (CSSW), Columbia University Global Center (CUGC) in Amman, University of Jordan (UJ), IRC, and IFH. Data collection took place between March – November 2018 across four number of health clinics (n = 2 at IRC, n =2 at IFH) across Jordan.

The final two papers use longitudinal data from Silk Road (PI: Nabila El-Bassel), a population-based study of 1,342 market vendors in Kazakhstan. The Silk Road study aimed to examine the influence of multilevel factors on HIV risk behaviors among a representative sample male migrant market vendors in the largest marketplace in Almaty, Kazakhstan: Baraholka market. Findings from this study have had important implications for understanding the determinants of HIV risks and health challenges among migrant workers in Central Asia, and there exists abundant potential to examine the panel nature of this data. Data were collected at baseline, three-month, six-month, and 12-month time periods. Using respondent driven sampling

(RDS), sampling for Silk Road was initiated by 14 seeds inclusive of male market vendors who were either external migrants, internal migrants, or non-migrants. The vast majority (88%, n = 1181) of the sample was recruited after the fifth wave. The final sample consisted mostly of external (37%, n = 502) and internal (21%, n = 278) migrants, with 37% of the sample being non-migrants (n = 562) (El-Bassel et al., 2016). Papers #2 incorporates the entire sample and Paper #3 includes only the internal migrant sub-group.

Aims and Hypotheses

This dissertation seeks to describe social support commonalities and distinctions between migrant typologies (ex. male and female, internal and external, forced and economic, etc.); describe the prevalence and severity of PTEs and depressive symptomology, and; examine the Buffer Effect of social support on psychosocial outcomes related to PTEs. Paper #1 will examine the Buffer Effect of social support on depression related to PTEs among female urban refugees in Jordan. Paper #2 will examine patterns of social support across time and between non-migrant and migrant typologies among male market vendors in Almaty, Kazakhstan. Paper #3 will the Buffer Effect of social support on depression related to PTEs among male market vendors in Almaty, Kazakhstan. The overarching aims and hypotheses of this dissertation are:

Aim 1. Describe social support among urban migrants;

Aim 2. Examine the direct relationship between social support and depressive symptomology;

Aim 3. Examine to what extent social support moderates the relationship between PTEs to depressive symptomology using relevant covariates/confounders in the model.

H₁: Social support can be measured as a latent construct among urban migrants.

(Corresponds to Aim 1)

H₂: Migrants who report with strong social support will have less depressive outcomes than migrants with lower social support (Corresponds to Aim 2).

H₃: The direct relationship of PTEs to depressive outcomes will be significantly moderated by social support class (Corresponds to Aim 3).

Migrants, who experience cycles of migration because of Push-Pull factors, are expected to have more volatile social support than non-migrants. However, the construct of social support is predicted to be valid across migrant and non-migrant groups (H₁: Papers #1 and #2). Migrants who have stronger social support are predicted to be more likely to have reduced depressive symptomology (H₂: Papers #1 and #3). Through examining the role of the Buffer Effect among urban migrants, this dissertation will also examine the role of resilience in the social context as it relates to mitigating against depressive outcomes (H₃: Papers #1 and #3).

Paper Briefing

Paper 1: Examining the role of social support for Syrian refugee women in Jordan: Evidence using latent class analysis and structural equation modeling

Aims: The purpose of Paper 1 is to examine the intersection between PTEs, social support and depression among female Syrian refugees living in Jordan. Refugees, who inherently experience a range of push factors across their migratory path, are expected to report a range of PTEs such as political persecution, community violence, or family separation. This paper's

primary aim is to examine whether social support moderates the association between PTEs and depression using structural equation modeling (SEM). The latent construct of social support, measured through latent class analysis (LCA), is hypothesized to be valid among this sample (H₁). First, separate associations will be examined between PTEs and social support; PTEs and depression; as well as social support and depression. These associations will determine any direct pathways between variables and also examine whether moderation is a statistically appropriate conceptualization (i.e. assuming PTEs and social support are not directly associated). The moderation analysis will be conducted next to understand if social support moderates the association of PTEs and depressive outcomes (as a “Buffer Effect”). Through examining the role of the Buffer Effect among Syrian refugees in Jordan, this paper will examine the role of resilience in the social context as it relates to mitigating against adverse depressive symptomology (H_{2,3}).

Collaboration: This paper was supported by the achievements of the Women ASPIRE’s investigative team and contributions by fellow researchers: Nabila El-Bassel (co-PI), Neeraj Kaushal (co-PI), Maysa’ Khadra (country-PI), Anindita Dasgupta (co-PI), Raeda Qutob (co-PI), Ruba Jaber (co-PI), and Hana Abu-Hasan (co-PI), and Mingway Chang.

Sample: Women ASPIRE is a cross-sectional survey of 507 female Syrian refugees in Jordan. The quantitative survey collected data related to the mental and physical health needs of female Syrian refugees living outside of camps in Jordan. Data were collected at Institute for Family Health (IFH) and International Rescue Committee (IRC) clinics by research assistants (RAs) either with graduate degrees in medicine, public health, or sociology. Women visiting the health clinics were eligible to participate if they were Syrian refugee women, above the age of 18, living outside a refugee camp, and willing to participate. Study participants were recruited

through a clinic-based systematic sampling approach in both clinics (Elfil & Negida, 2017; Suresh, Thomas, & Suresh, 2011). RAs approached every 3rd or 5th female on a clinic waitlist that listed clinic patients based on check-in time (the exact recruitment interval varied across clinics due to varying numbers of Syrian refugee). The enrollment rate was 84%, yielding a final sample of 507 women.

Paper 2: Examining social support among male market vendors in Almaty, Kazakhstan:

Modeling measurement invariance of an ordinal scale

Aims: The purpose of Paper 2 is to test the measurement invariance of social support using the ENRICH Social Support Instrument (ESSI) among male market vendors in Almaty, Kazakhstan. Migrants, who experience cycles of migration because of Push-Pull factors, are expected to have more variable social support than non-migrants; however, less is known about the potential construction of social support across these populations. The primary aim is to test the longitudinal invariance of the ESSI (Vaglio et al., 2004) to ensure that the scale's psychometric properties are consistent across the two time points – baseline (t_0) and twelve-month (t_1). The secondary aim is to explore the validity of the ESSI among three subgroups of market vendors – internal migrants, external migrants, and non-migrants. The construct of social support was predicted to be valid across migrant and non-migrant groups (H_1). These tests of invariance assess equality of ESSI's factor loadings and item intercepts across time.

Collaboration: This paper was supported by the achievements of the Silk Road's investigative team and contributions by fellow researchers: Nabila El-Bassel (PI), Andrea Norcini Pala, and Mingway Chang.

Sample: Silk Road is a longitudinal population-based study of 1,342 economic migrants in Kazakhstan. The study aimed to examine the influence of multilevel factors on HIV risk behaviors among a representative sample of male migrant market vendors in the largest marketplace in Almaty, Kazakhstan: Baraholka market. Findings from this study have had important implications for understanding the determinants of HIV risks and health challenges among migrant workers in Central Asia, and there exists abundant potential to examine the panel nature of this data. Data were collected at baseline (t_1), three-month (t_2), six-month (t_3), and twelve-month (t_4) time periods. Using respondent driven sampling (RDS), sampling for Silk Road was initiated by 14 seeds inclusive of male market vendors who were either external migrants, internal migrants, or non-migrants. The vast majority (88%, $n = 1181$) of the sample was recruited after the fifth wave. The final sample consisted mostly of external (37%, $n = 502$) and internal (21%, $n = 278$) migrants, with 37% of the sample being non-migrants ($n = 562$) (El-Bassel et al., 2016).

Paper 3: Examining the role of social support for internal migrants in Almaty, Kazakhstan:

Evidence using structural equation modeling

Aims: The first aim of Paper 3 is to examine whether social support is negatively associated with depressive symptomology. To second aim is to examine whether social support moderates the association between PTEs and depressive symptomology. Internal migrants, who experience a range of push factors across their migratory path, are expected to have a high number of PTEs. Through examining the role of the Buffer Effect among male economic migrants in Kazakhstan, this paper will also examine the role of resilience in the social context as it relates to mitigating against adverse depressive symptomology across a one year period ($H_{2,3}$).

Collaboration: This paper was supported by the achievements of the Silk Road's investigative team and contributions by fellow researchers: Nabila El-Bassel (PI), Trena Mukherjee, Mingway Chang, and Brooke West.

Sample: Silk Road is a longitudinal population-based study of economic migrants in Kazakhstan. The study yielded a representative sample of 1,342 male migrant market vendors in the largest marketplace in Almaty, Kazakhstan: Baraholka market. Numerous studies have been published from the baseline data (El-Bassel et al., 2016; Ismayilova et al., 2014; Mergenova et al., 2016a; Michalopoulos et al., 2018; Ward, Shaw, Chang, & El-Bassel, 2018); yet there remains a wealth of opportunities to examine variables across time, given the panel nature of this data. Data were collected at baseline, three-month, six-month, and 12-month time periods. Using respondent driven sampling (RDS), sampling was initiated by 14 seeds inclusive of male market vendors who were either external migrants, internal migrants, or non-migrants. The vast majority (88%, n = 1181) of the sample was recruited after the fifth wave. The final sample consisted mostly of external (37%, n = 502) and internal (21%, n = 278) migrants, with 37% of the sample being non-migrants (n = 562) (El-Bassel et al., 2016).

Summary

This three-paper dissertation utilizes data from studies conducted in two settings to contribute to the scientific literature and fill three primary gaps in current research. Firstly, each of these papers fill a gap in migration studies, broadly, through using innovative methodologies to explicitly examine the moderating role of social support – a construct of increasing interest for policy and programs related to durable solutions. Secondly, the urban lens allows for a nuanced exploration into considerations related to urban migration, which tie directly to the increase in

urbanization literature and response related to global migration. Lastly and through focusing on migrants from the two sub-regions of Asia (Middle East and Central Asia), this dissertation provides evidence of social support in LMICs. Thus, this dissertation fosters critical dialogue around psychosocial prevention and responses efforts pertaining to the increasingly relevant phenomenon of urban migration.

Paper 1: Examining the role of social support for Syrian refugee women in Jordan: Evidence using latent class analysis and structural equation modeling

1.1 Introduction

Nearly half of Syria's population has been affected by forced migration since the onset of civil war in 2011, with around one million Syrians being displaced to Jordan (UNHCR, 2018). In Jordan, most refugees live outside of camps in urban centers (UNHCR, 2019). The International Organization for Migration (IOM) indicates that women and girls who migrate encounter “dual vulnerability” due to their migratory status and gender (IOM, 2013). In addition to the challenges faced from being a refugee, women may face unique gendered vulnerabilities due to social norms (such as negative perceptions around economic engagement) and societal expectations (such as household caregiving responsibilities) for women (IOM, 2013; UN Women, 2018).

Similar to the experiences of other refugees, displaced Syrians may be exposed to potentially traumatic events (PTEs) – broadly defined as distressing experiences that can result in psychological harm. PTEs can occur during their time in Syria (e.g. witnessing violence, surviving bombings, etc.), throughout their physical migration (e.g. family separations, food insecurity, etc.), and after resettling in Jordan (e.g. stigmatization, unemployment, etc.). According to Lee, a range of factors can positively (pull) or negatively (push) influence the

decision to migrate (Lee, 1966). Post-Migration Living Difficulties (PMLD) – including PTEs such as unemployment, family separation, discrimination, and poverty – are events that refugees may experience in host countries like Jordan. The PMLD scale measures exposure to PTEs after physical migration and has been used to study challenges faced by refugees in various global settings (Bogic, Njoku, & Priebe, 2015; Schick et al., 2018). While there is overlap in lived experiences, women and men are likely to experience different PMLDs. For example, Syrian women are less likely to be employed than Syrian men in Jordan. Research highlights that PTEs, such as PMLDs, have both acute and prolonged negative impact on mental health (Kartal, Alkemade, Eisenbruch, & Kissane, 2018; Li, Liddell, & Nickerson, 2016; Miller & Rasmussen, 2010).

Research highlights high rates of adverse mental health outcomes among the global refugee population (Bogic, Njoku, & Priebe, 2015; Karunakara et al., 2004; Steel et al., 2009; Turrini et al., 2017). However, rates vary as evident by the range of depression prevalence among refugees and asylum seekers – 4% (Fazel, Wheeler, & Danesh, 2005) to 44% (Lindert, Ehrenstein, Priebe, Mielck, & Brähler, 2009). While prevalence rates of depression among Syrian refugees have not been reported, published studies concerning mental health of Syrian refugees in Jordan corroborate high rates of overarching mental health needs (Al-Fahoum et al., 2015; Al-Smadi et al., 2016; Basheti, Qunaibi, & Malas, 2015; Krause et al., 2015; McKenzie, Spiegel, Khalifa, & Mateen, 2015; Mhaidat, 2016; Weinstein, Legate, & Khabbaz, 2016). However, no academic mental health study of Syrian refugees in Jordan has explicit gendered considerations, despite known differences between expressions of mental health among men and women (WHO, 2002) and increasing concerns related to the wellbeing of Syrian refugee women

(UN Women, 2018). Furthermore, mental health and psychosocial support (MHPSS) is an often-overlooked component to humanitarian response in host nations (HHI, 2011), including Jordan.

The literature shows that informal availability of functional social support (e.g. the fluid availability for transference of tangible or intangible material between friends and family members) can mitigate against adverse mental health outcomes among traumatized populations (Shishehgar, Gholizadeh, DiGiacomo, Green, & Davidson, 2017; Simich, Beiser, & Mawani, 2003; Stewart et al., 2011). However, there is a paucity of research examining functional social support among refugees or in low and middle income countries (LMICs). This paucity of research is alarming given the inherent changes to the social environment of refugees as a result of displacement and the known high rates of mental health needs among refugees. Furthermore, refugee women living outside of camps may be additionally vulnerable to insufficient social support if not integrated through employment or other means of community engagement (Banulescu-Bogdan, 2020).

With the exception of one study that highlighted how a “need-satisfaction” intervention could decrease depressive symptomology among adult Syrian refugees in Jordan (Weinstein, Legate, & Khabbaz, 2016), mental health research of adult Syrian refugees in Jordan does not include interventions or other pathway analyses examining mental health outcomes. Instead, most mental health research of adult Syrian refugees is descriptive in nature and does not focus on women (Al-Fahoum et al., 2015; Al-Smadi et al., 2016; Basheti, Qunaibi, & Malas, 2015; Krause et al., 2015; McKenzie, Spiegel, Khalifa, & Mateen, 2015; Mhaidat, 2016). A limited number of other social support papers have identified the direct association of social support to improved mental health and integration in refugee settings (Riederer, 2017; Stewart et al., 2011); however, the scientific literature on social support and refugees does not include an expansive

examination of the indirect role of social support on mental health (Renner, Laireiter, A.-R., & Maier, 2012). Overall, the complex mechanisms underlying the existence and strengthening of functional social support in forced displacement contexts, including in refugee settings, continues to be under-examined despite a foundational scientific knowledge of the potential influence of social support on mental health (Cohen, Underwood, & Gottlieb, 2000), including within resilience frameworks (van Breda, 2018).

Scientific theories indicate that social support can directly (*Main Effect*) or indirectly (*Buffer Effect*) connect to mental health outcomes (Cohen, Underwood, & Gottlieb, 2000). Main Effect theory hypothesizes that social support is continuously influential, while Buffer Effect theory concentrates on the instrumental role of social support in relation to stressors. Present day social support research is primarily framed around the instrumental role of functional social support through the Buffer Effect. Classical Buffer Effect theory posits that social support facilitates an instrumental role between the association of stress, such as PMLDs, and depression (Cohen & Wills, 1985; Thoits, 1982). Despite one study by Renner and colleagues (2012) that operationalized social support as a moderator when examining mental health outcomes among refugees and asylum seekers, there is a notable absence of research examining the Buffer Effect among refugee populations. However, researchers have hypothesized that “social support of the right type, provided at the right time and level, can mitigate the worst effects of war and displacement on victims/survivors.” (Almedom, 2004).

This paper seeks to empirically analyze the relationship between PMLDs, social support, and depression among Syrian refugee women living in Jordan. Guided by the Push-Pull Theory (Lee, 1966), Stress-Buffering Hypothesis (Cohen & Wills, 1985), and van Breda’s conceptualization of resilience (2018) this paper uses latent class analysis (LCA) and structural

equation modeling (SEM) to examine two overarching hypotheses related to the “Main Effect” and “Buffer Effect”:

Main Effect:

H_{1.1a}: Syrian refugee women living outside of camps in Jordan who have experienced higher of PMLDs are more likely to meet the criteria for depression than Syrian refugee women living outside of camps in Jordan who have experienced lower rates of PMLDs.

H_{1.1b}: Syrian refugee women living outside of camps in Jordan who have stronger availability of functional social support are less likely to meet the criteria for depression than Syrian refugee women living outside of camps in Jordan who have weaker availability of functional social support.

Buffer Effect:

H_{1.2}: The direct association of PMLDs to depression outcomes, among Syrian refugee women living outside of camps in Jordan, is moderated by social support class.

1.2 Methodology

Data Collection

Women ASPIRE is a cross-sectional survey of Syrian refugee women living outside of refugee camps in Jordan. This quantitative survey included questions on the mental and physical health needs of Syrian refugee women. Data were collected at Institute for Family Health (IFH) and International Rescue Committee (IRC) clinics in Amman, Zarqa, Mafraq, and Ramtha by

research assistants (RAs) with graduate degrees in medicine, public health, or sociology. Women visiting the health clinics were eligible to participate if they were Syrian refugee women, above the age of 18, living outside a refugee camp, willing to participate, and not presenting with cognitive impairment. Study participants were recruited through a clinic-based systematic sampling approach in all clinics (Elfil & Negida, 2017; Suresh, Thomas, & Suresh, 2011). The enrollment rate was 84%, yielding a final sample of 507 women. This study was approved by the Columbia University institutional review board (IRB) and the ethical review board at University of Jordan.

Measurement

Depression: Depression was measured as the outcome measure through the four-item Center for Epidemiologic Studies Depression Scale (CES-D) scale (Radloff, 1977). Based on a 7-day recall, respondents answered the frequency of occurrence of symptoms using a Likert scale of four options ranging from “rarely or none of the time (less than 1 day)” to “most all of the time (5-7 days)”. Symptoms include “I felt depressed,” “I felt lonely,” “I had crying spells,” and “I felt sad.” Acceptable internal reliability was determined ($\alpha \geq .7$). The dichotomous output variable separated women into either meeting the criteria of depression (based on a cutoff of 4) or not.

Social support: Social support was measured through LCA as a predictor variable ($H_{1.1b}$) and moderator ($H_{1.2}$). Classes of social support – low and moderate – were derived from seven questions related to perceived functional social support from friends and family. Respondents answered the following prompt: “How many friends or family members do you have currently from whom you can...” and options included “talk when you feel upset or angry or you need

help” (intimacy), “ask advice about personal problems you may be having” (advice), “ask to borrow money when you need it” (material), “ask to stay in for a while in their place” (practical), “ask for help with a task such as helping taking care of your kids” (integration), “ask for legal support” (cognitive guidance), and “ask to help you find a job” (problem solving). Responses were recoded into an ordinal variable by whether respondents reported no friends or family; one friend or family member; two, three, or four friends and/or family members, or; more than four friends and/or family members. Acceptable internal reliability was determined ($\alpha \geq .7$) and only one eigenvalue from polychoric factor analysis was greater than one.

Post-migration living difficulties: As the primary predictor variable ($H_{1.1a}$ and $H_{1.2}$), the Post-Migration Living Difficulties (PMLD) scale was used as a latent variable. The PMLD scale has consistently been identified as a predictor of mental health among displaced populations (Silove, Sinnerbrink, Field, Manicavasagar, & Steel, 1997; Steel, Silove, Bird, McGorry, & Mohan, 1999). Respondents answered the severity of each item using a Likert scale of five options, ranging from “no problem at all” to “big problem”. A sixth option, “not applicable,” was recoded as “no problem at all”. Questions include concepts like “Not being able to find work,” “Difficulty finding accommodation,” and “Discrimination from non-Syrian community.” One PMLD was excluded because it overlaps with the CES-D measure of loneliness. Another PMLD, “Challenges with immigration application,” was excluded after factor analysis. Sensitivity tests were conducted with this item included, as well, to confirm that its exclusion did not alter the direction or significance of results. Acceptable internal reliability coefficient of the twelve measures of the PMLD scale was determined ($\alpha \geq .7$) and only one eigenvalue from polychoric factor analysis was greater than one.

Sociodemographic characteristics: Sociodemographic characteristics used as exogenous predictor variables included age, education level, marital status, having children, and current governorate in Jordan. Age (in years) was a continuous variable. Dichotomous variables included marital status, having children, and education level. Marital status was dichotomized to married (marriage, common law marriage, and de facto marriage) or not married (divorced, cohabitating, widowed, or single); having children was dichotomized into having at least one child currently within the household or not; education level was dichotomized into less than primary education or at least primary education. The current governorates in Jordan included Amman, Irbid, Mafraq, Zarqa, and all other governorates.

Migration characteristics: Migration characteristics used as exogenous predictor variables included years living in Jordan, lived experience in refugee camp, and governorate of origin in Syria. Years living in Jordan was a continuous variable. Lived experience in a refugee camp was dichotomized into ever living in a refugee camp or not. The governorates of origin in Syria included Aleppo or Idlib; Al-Raqqah, Deir ez-Zor, or Hasaka; Damascus or Rif Dimashq; As-Suwayda, Daraa, or Qunitra, and; Hama or Homs.

Data Analysis

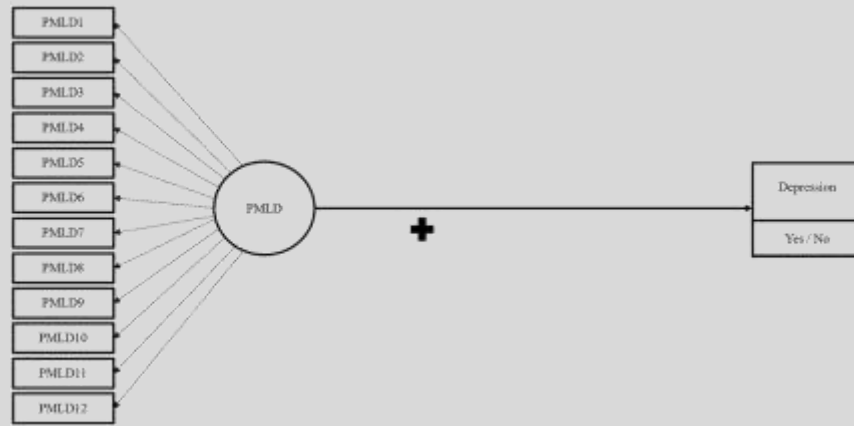
Before conducting hypotheses testing, variable distributions were assessed through analyzing univariate (skewness and kurtosis) and multivariate (Mardia's test) statistics. Given the rarity of missing data ($n = 20$; 3.94%) and concerns related estimate errors for imputation, missing data were dropped in the reported analysis (i.e. listwise deletion). However, extreme case imputation was conducted to confirm that results would not change in significance nor direction. All analyses were conducted using Stata (version 15).

In order address the ordinality of observed variable for PMLD and social support, polychoric analyses was used instead of the usual covariance matrix preferred for continuous variables. Through assessing correlation of each dyad of variables for PMLD and social support under the theoretical assumption of normal distribution, polychoric analyses confirmed a one factor model for both PMLD and social support. Then, latent classes analyses (LCA) was conducted (i.e. selecting the output with lowest Bayesian information criterion and Akaike information criterion via the GSEM command in Stata). Two classes of social support were derived from seven questions related to perceived functional social support from friends and family. Class 1 is referred to as the “low social support class” and Class 2 is referred to as the “moderate social support class;” these class names were given by the author, based on the distribution of classes.

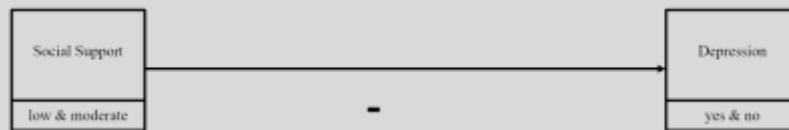
The hypothesis of a direct association (“Main Effect”) was analyzed using adjusted odds ratio (aOR) between PMLD scores and depression scores, as well as social support class and depression scores. The hypotheses of an indirect association (“Buffer Effect”) was analyzed through moderation analysis. See Figure 1.1 for visualization of hypotheses. Independent aOR models were conducted for each social support class, then z-scores were calculated to determine if there was a significant difference in the influence of PMLD on depression between models. Participants’ age, years in Jordan, lived experience in a refugee camp, governorate in Jordan, governorate in Syria, education level, children, and marital status were included in all direct effect and indirect effect models as control variables – specified as exogenous predictor variables.

Figure 1.1: Hypotheses for social support, PMLD, and depression.

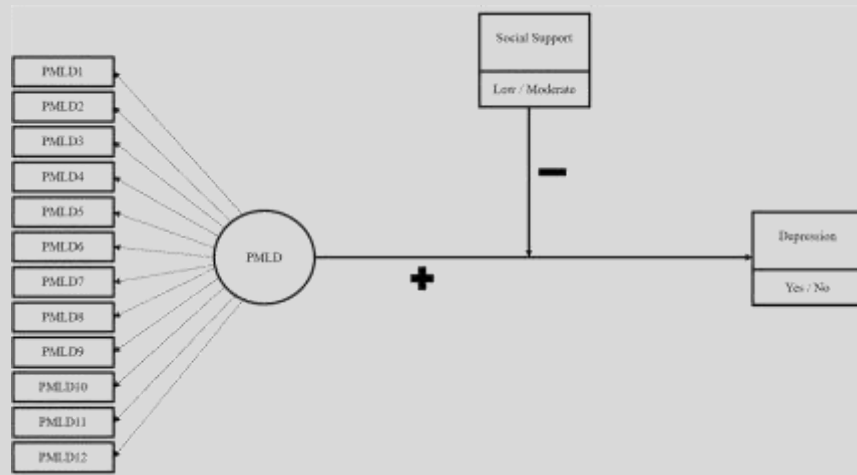
H_{1.1a}: Syrian refugee women living outside of camps in Jordan who have experienced higher PMLDs are more likely to meet the criteria for depression than Syrian refugee women living outside of camps in Jordan who have experienced lower rates of PMLDs.



H_{1.1b}: Syrian refugee women living outside of camps in Jordan who have stronger availability of functional social support are less likely to meet the criteria for depression than Syrian refugee women living outside of camps in Jordan who have weaker availability of functional social support.



H2.1: The direct association of PMLDs to depression outcomes, among Syrian refugee women living outside of camps in Jordan, is moderated by social support class.



1.3 Results

Descriptive analysis of the sample indicate the average age of participants at 33.83 years old (SD: 10.95). The vast majority of women were married (90.14%) and 67.56% had at least one child at home. Less than half of the sample received at least a primary education (40.04%). Most women lived in either Amman (29.57%), Zarqa (25.87%), Mafraq (23.41%), or Irbid (19.30%) with only 1.85% (n = 9) of respondents living in another governorate in Jordan. There was a fairly even distribution across governorates in Jordan with women from As-Suwayda, Daraa, or Qunitra (35.73%), Hama or Homes (23.00%), Aleppo or Idlib (18.48%), Damascus or Rif Dimashq (12.32%), or Ar Raqqa, Deir ez-Zor, or Hasaka (10.47%). Moreover, most women lived in a Syrian refugee camp in Jordan at some point (70.43%) and the average number of years in Jordan was 5.79 (SD: 1.36).

Descriptive analysis also highlighted that 63.04% women met the CES-D criteria for depression. While there were low rates of communication issues with the local non-Syrian community (mean: 1.73; SD: 1.00) and challenges with the immigration application (mean: 1.63; SD: 1.31), the most pervasive PMLD was poverty (mean: 4.14; SD: 1.20) and fears of being forced to return to Syria (mean: 4.08; SD: 1.31). Furthermore, the average number of friends or family members available for social support ranged from 0.48 (SD: 1.19) for legal support to 2.20 (SD: 1.98) for talking when feeling upset, angry, or in need of help.

Table 1.1: Descriptive statistics of Syrian refugee women living outside of camps in Jordan*.

Variable	Label	mean	SD
Age		33.83	10.95
Years in Jordan		5.79	1.36
Indicate if these are a problem for you in your current situation in Jordan:	Communication with local non-Syrian community	1.73	1.00
	Discrimination from local non-Syrian community	2.05	1.24
	Separation from family	2.99	1.72
	Worries about family back in Syria	3.91	1.36
	Unable to return home in emergency	3.82	1.36
	Not being able to find work	3.82	1.32
	Challenges with immigration application ⁺	1.63	1.31
	Fears of being forced to return to Syria	4.08	1.31
	Worries about not getting treatment for health problems	3.91	1.17
	Poor access to psychological counseling services	2.91	1.40
	Poverty	4.14	1.20
	Loneliness and boredom ⁺	3.53	1.38
	Isolation	3.23	1.51
	Poor access to schooling for children	3.51	1.64
How many friends or family members do you have currently with whom you can....	talk when you feel upset or angry or you need help	2.20	1.98
	ask advice about personal problems	1.70	2.48
	ask to borrow money when you need it	1.95	2.09
	ask to stay in for a while in their place	1.09	1.68
	ask for help with a task (ex. childcare)	1.55	1.72
	ask for legal support	0.48	1.19
	ask to help you find a job	0.89	1.93
Variable	Options	n	%
Depression	Does not meet CES-D criteria	180	36.96%
	Meets CES-D criteria	307	63.04%
Marital Status	Not married	48	9.86%
	Married	439	90.14%
Education	Less than primary	292	59.96%
	Primary or more	195	40.04%
Children	No	158	32.44%
	Yes	329	67.56%
Ever lived in refugee camp	No	144	29.57%
	Yes	343	70.43%
Governorate of origin in Syria	Aleppo or Idlib	90	18.48%
	Al-Raqqah, Deir ez-Zor, or Hasaka	51	10.47%
	Damascus or Rif Dimashq	60	12.32%
	As-Suwayda, Daraa, or Qunitra	174	35.73%
	Hama or Homs	112	23.00%

Current governorate in Jordan	Amman	144	29.57%
	Mafraq	114	23.41%
	Zarqa	126	25.87%
	Irbid	94	19.30%
	Other	9	1.85%

*Excluded from factor analysis on post-migration living difficulties (PMLD)

After confirming a one factor model using polychoric analysis, an LCA identified two classes of social support that the author designated as low social support (class 1) and moderate social support (class 2). There were no outstanding trends of significance between social support class and sociodemographic nor migration characteristics. Similarly, there were no outstanding trends when examining the correlations between social support class and PMLD items.

Upon examination of the two class model (Table 1.2), the distinction between each class was consistent. On average when compared to the other class, respondents in the low social support class (class 1, n = 255) were more likely to be without any friends or family members to provide social support for all items. Following this trend, respondents in the moderate social support class (class 2, n = 232) were more likely, on average, to have more than one friend(s) and/or family member(s) to provide social support for a given variable when compared to the low social support class. The only option with variance was having only one friend or family member; whereby, the low social support class was more likely to report only one friend or family member for five of the items (intimacy, advice, material, practical, and integration) and the moderate social support class was more likely to report only one friend for two of the items (cognitive guidance and problem solving).

Table 1.2: Latent classes of social support among Syrian refugee women living outside of camps in Jordan.

Variable	Options	Class 1 (low social support) n=255	Class 2 (moderate social support) n=232	Difference (Class 1 – Class 2)	
		Margin	Margin	Direction	Amount
Intimacy	None	22.63%	1.44%	+	0.21
	Only 1	43.09%	13.87%	+	0.29
	2-4 supports	32.18%	67.19%	-	0.35
	More than 4	2.11%	17.50%	-	0.15
Advice	None	35.27%	3.93%	+	0.31
	Only 1	50.08%	22.56%	+	0.28
	2-4 supports	14.27%	64.02%	-	0.50
	More than 4	0.38%	9.49%	-	0.09
Material	None	33.86%	4.62%	+	0.29
	Only 1	39.38%	19.66%	+	0.20
	2-4 supports	23.28%	61.02%	-	0.38
	More than 4	3.48%	14.70%	-	0.11
Practical	None	59.56%	31.11%	+	0.28
	Only 1	30.54%	29.80%	+	0.01
	2-4 supports	9.91%	30.05%	-	0.20
	More than 4	0.00%	9.05%	-	0.09
Integration	None	45.20%	9.40%	+	0.36
	Only 1	36.43%	22.04%	+	0.14
	2-4 supports	18.38%	56.50%	-	0.38
	More than 4	0.00%	12.06%	-	0.12
Cognitive Guidance	None	85.61%	64.54%	+	0.21
	Only 1	9.55%	18.38%	-	0.09
	2-4 supports	4.84%	13.21%	-	0.08
	More than 4	0.00%	3.88%	-	0.04
Problem Solving	None	80.34%	48.78%	+	0.32
	Only 1	12.05%	15.20%	-	0.03
	2-4 supports	6.76%	28.33%	-	0.22
	More than 4	0.85%	7.69%	-	0.07

After confirming a one factor model using polychoric analysis, PMLD items were used to create the latent variable. Using SEM to test the Main Effect hypothesis, the association between the PMLD latent variable and the dichotomous depression outcome were examined to confirm a direct association between PMLD and depression (Table 1.3). All items were significantly correlated and the overall latent variable was significantly associated to depression ($p < 0.001$). When converting the coefficient to the adjusted odds ratios, one increase in PMLD score is associated to a 2.87 higher odds of meeting the CES-D criteria for depression (CIs: 2.10-3.93). Furthermore, respondents in the moderate social support class were significantly less likely to meet the CES-D criteria for depression (0.57 lower odds) than respondent in the low social support class (CIs: 0.38-0.83; $p < 0.01$). The Main Effect hypothesis for the relationship between PMLD and depression, as well as social support and depression, were supported by the analysis.

Table 1.3: Direct associations of post-migration living difficulties and social support with depression.*

		aOR	Sig.	Confidence Interval
PMLD		2.87	***	[2.10, 3.93]
Social Support	Class 1 (low social support)	omitted		
	Class 2 (moderate social support)	0.57	**	[0.38, 0.84]

*Separate models were conducted for post-migration living difficulties (PMLD) and social support classes. Each odds ratio adjusted (aOR) for age, years in Jordan, lived experience in a refugee camp, governorate in Jordan, governorate in Syria, education level, children, and marital status. Results are statistically significant at *p<0.05, **p<0.01, and ***p<0.001 (Sig.). Latent factors not included in table

Lastly, an additional SEM approach was used to test the Buffer Effect hypothesis through the examining the moderating role of social support on the association of PMLD and depression. By comparing the PMLD coefficients between dyads of the two classes (low vs. moderate), PMLD remained a significant predictor for increasing odds of depression for the low social support class ($p < 0.001$) and the moderate social support class ($p < 0.01$). Table 1.4 highlights that, on average, PMLD scores had higher odds of yielding depression outcomes for individuals with low social support (aOR: 4.06; CI: 2.39-6.07) relative to individuals with moderate social support (aOR: 2.07; CI: 1.37-3.13). Findings from the analysis reject the null hypothesis that that there is not a significant difference between classes when comparing z-scores derived from each model's coefficient and standard errors ($p < .05$). The Buffer Effect hypothesis for the moderating role of social support on the relationship between PMLD and depression was supported by the analysis.

Table 1.4: Moderation analysis of social support on the association of post-migration living difficulties and depression.*

	Class 1 (low social support; n=255)			Class 2 (moderate social support; n=232)			Cross-class comparison
	aOR	Sig.	Confidence Interval	aOR	Sig.	Confidence Interval	Sig.
PMLD	4.06	***	[2.39, 6.87]	2.07	**	[1.37, 3.13]	*

*Separate models were conducted to examine the effect of post-migration living difficulties (PMLD) for each class of social support. Each odds ratio adjusted (aOR) for age, years in Jordan, lived experience in a refugee camp, governorate in Jordan, governorate in Syria, education level, children, and marital status. Results are statistically significant at *p<0.05, **p<0.01, and ***p<0.001 (Sig.). Latent factors not included in table.

1.4 Discussion

Given the severity of the mental health burden for refugees themselves and its connectivity to integration efforts in host communities, this study addresses a gap in the literature on social support among an important yet understudied population— Syrian refugee women living outside of camps in Jordan. The findings indicate that few help-seeking Syrian refugee women in Jordan meet the Dunbar threshold of five persons available per need (Hill & Dunbar, 2003). This is particularly concerning in its connection to social isolation as the ramifications of social isolation can accrue negative impacts to the women and to subsequent generations through their children (Greenberg, Gelatt, Bolter, Workie, & Charo, 2018). Also alarmingly, respondents indicated high rates of PMLD (mean = 3.23). Given that the majority of women met the criteria for depression (63.04%), these rates exceed even the highest average prevalence rates reported by other research on refugee mental health (Lindert, Ehrenstein, Priebe, Mielck, & Brähler, 2009). The findings from this study contribute to previous refugee research indicating that secondary or daily stressors can be more impactful than stressors experienced in home countries (Rasmussen et al., 2010). The most common PMLD were related to experiences within Jordan – poverty (mean = 4.14) and fears of being forced to return to Syria (mean = 4.08).

The hypotheses of both a Main Effect (H_{1.1a} & H_{1.1b}) and Buffer Effect (H_{1.2}) were supported. Both PMLD, directly ($p < 0.001$), and high social support, inversely ($p < 0.01$), were associated with depression. Further, the research highlighted that social support contributes in moderating the relationship of PMLD on depression ($p < 0.05$). By identifying direct (*Main Effect*) and indirect (*Buffer Effect*) role of social support on depression, these findings contribute to specific responses for refugees in relation to practice, intervention, policy, and research.

Given the connection of social support and depressive symptomology, these findings can first inform practice approaches within the field of mental health in humanitarian settings. Health and social service agencies that work with refugees and other forced migrants may benefit from introducing screening around PMLDs into their mental health intakes. If refugees have experienced a high rate or severity of PMLDs, they may be more likely to need services related to depression. That in itself may help agencies identify the most “at risk” persons among a population who, by definition, experience many PMLDs. Furthermore, having this information may support the ability of agencies to advocate for funding mental health resources. Social workers or other mental health professionals should also collect key social support indicators – such as availability of functional social support – during psychosocial intakes. By having this information available after intake procedures, practitioners may be better equipped to identify and address functional social support gaps or strengths among clients. Furthermore, improving the inclusion of social support into response efforts could address the lack of resilience framing in many humanitarian initiatives by incorporating preventative care considerations within mental health programming (Shishehgar, Gholizadeh, DiGiacomo, Green, & Davidson, 2017).

In order to leverage the instrumental role of social support, these findings have implications for mental health and psychosocial (MHPSS) interventions related to depression. Given the numerous research interventions aiming to mitigate adverse mental health outcomes through fostering social support (Cohen, Underwood, & Gottlieb, 2000), there is a notable gap in research and programming regarding similar interventions for refugee populations. There are two main approaches to mental health interventions for refugees: the clinical trauma-focused approach and the psychosocial support approach (Alfadhli & Drury, 2016). The former is much more common, though the psychosocial support approach fosters a more holistic inclusion of

systems for participants. The psychosocial support approach enables a wide range of potential outcomes to foster longstanding influence, but these interventions are often not feasible within the short-timeframes seen in many clinical trauma-focused interventions with refugees.

Unfortunately, humanitarian response often focuses on short term results which may overlook the role that building social support may have in sustaining long-term outcomes (Silove, Ventevogel, & Rees, 2017). These potential psychosocial support interventions should also expand beyond individual level counseling. Group models, including family-level interventions, may be useful in reducing depression by building the social capital (incl. functional social support) of participants. Moreover, mental health interventions for depression may critically link with work-related or work-adjacent interventions (Banulescu-Bogdan, 2020) to both mitigate stigma associated to explicit MHPSS interventions (Salem-Pickartz, 2007) to coincide with outcomes that target the inherent poverty of this population (UNHCR, 2015).

Findings from this research can also inform more holistic resiliency and integration policies that take specific considerations for the overall health and welfare of refugees (including depression). Refugee policy reports that incorporate the social support lexicon (Beirens & Ahad, 2018) are often framed around institutional support provided by resettlement agencies rather than social support among or for the refugees themselves. One notable exception is Turkey's newly created Directorate of Psychosocial Support during Migration and Emergencies within the Ministry of Family and Social Policy which explicitly oversees the influence of policies on MHPSS matters. Explicit social support specific policies like those in Turkey and within other LMICs should be developed (Malawi, 2012) when possible, but what may be more feasible is explicit inclusion of social support in existing policies (such as education or employment). For example, the Jordan Compact should mainstream social support indicators across its activities to

ensure that social support is addressed across sectoral responses. No formal and explicit social support policy exists in Jordan nor is social support mentioned within the Jordan Compact (a landmark education and employment policy signed in 2016). The lack of representation of social support in policy does not equate lack of interest. Outspoken critiques of refugee policies have indicated that policies across sectors are inadequate in their consideration of social support (Stewart et al., 2008). On a broader scale, this research can inform how international policies related to resiliency and integration of refugees in host communities – like the Global Compact on Refugees – should prioritize the mainstreaming of social support within response efforts to not only build resilience but, also support integration efforts.

Considering the foundational knowledge base provided by findings from this study, the research community should further explore the instrumental role of social support between PTEs and mental health outcomes among migrants. While there may be potential for social support to enable the treatment of depression, most research is framed from the perspective of how social support can be preventative. Thus, the findings from this study also have important implications for prevention research. Given that newly arrived refugees are the most vulnerable in the establishment and maintenance of social networks (Stewart et al., 2008), early response is important. Research should examine how the early development of functional social support at the onset of arrival in host countries may reduce the impact of new stressors experienced within the host country, such as PMLD. If incorporating social network analyses, future research could also critically examine the role, functions, and connectivity of each member of a given network.

Furthermore, research should link with existing humanitarian response programs for women and girls – especially safe spaces – to examine how these programs establish and build community networks among participants. The development of safe spaces is advocated by the

MHPSS Inter-Agency Standing Committee (IASC) guidelines for humanitarian response (IASC, 2008). Moreover, the Global Toolkit for Women and Girls Safe Spaces indicates that the second objective of safe spaces is “[t]o support women’s and girls’ psychosocial wellbeing and creation of social networks.” (IMC & IRC, 2019). Therefore, there is potential for researchers to engage with ongoing and planned Safe Spaces to examine the programmatic value of Safe Spaces to build social support, as well as addressing MHPSS needs. The need for this integrated research is highlighted by the Harvard Humanitarian Action Summit that there needs to be stronger evidence-bases for MHPSS responses in humanitarian settings (HHI, 2011).

1.5 Limitations

Conclusions drawn from these findings should be considered alongside a few study limitations. Firstly, this study has temporal limitations. The cross-sectional nature of the data hinders the ability to confidently assert causality. This limitation is particularly relevant given the potential intersection of PMLD, social support, and depression. Further, social support is conceptualized a moderator even though it occurred *after* predictor variable. This aligns with previous Buffer Effect research but counters statistical preference for moderators to occur during or before predictor variables. Secondly, this research utilized available social support items within the Women ASPIRE survey to construct a measure of social support. Future studies should include standardized social support scales, both functional and structural. Finally, the study was conducted at health care setting and, thus, may not be representative of all out-of-camp Syrian refugee women in Jordan (e.g. these women exhibit help-seeking behavior). While research assistants were trained to reduce against biased responses, social desirability bias may have influenced responses related to mental health symptoms due to stigma and social norms

related to mental health. However, reported depression symptomology from respondents was higher than other studies in the region; thus, the paper does not assert any specific evidence that social desirability bias is notably more present within the measurement of depression for Women ASPIRE than other refugee studies in the region.

1.6 Conclusion

Despite the limitations of the study, the findings from this research highlight an innovative application to a well-researched topic that, if further validated across humanitarian contexts, would have important implications for practice, interventions, policies, and research for migrants. To our knowledge, this is the first paper of its kind to examine buffer effect among refugees in MENA and, specially, refugee women living outside of camps in Jordan. These findings add to the literature by not only reinforcing previous research identifying a direct association between social support and depression but also highlighting that social support has instrumental value in mitigating the influence of PMLD on depression outcomes among the sample of women. Through examining both the Main Effect and Buffer Effect of social support on depressive symptomology, this research informs the understanding of how and to what extent social support influences depression outcomes for Syrian refugee women who have experienced PMLDs and live outside of a refugee camp in Jordan. This study should foster advocacy around the multifaceted role of social support among refugees, particularly Syrian refugee women living outside of camps in Jordan. Despite international and Jordanian efforts to support the resilience of out-of-camp refugees, including the Jordan Compact, integration remains a challenge for Syrian refugees in Jordan. The findings from this paper have the potential of integrating

resilience-building within the social process of migration as it relates to mitigating against depressive symptomology.

Paper 2: Examining social support among male market vendors in Almaty, Kazakhstan: Modeling measurement invariance of an ordinal scale

2.1 Introduction

Labor markets in low- and middle-income countries (LMICs), including those within Central Asia, are bolstered by the inputs of economic migrants. With the collapse of the former Soviet Union in 1991, Central Asian countries experienced increasing rates of unemployment and poverty. The resulting economic downfall contributed to increased emigration from Tajikistan, Kyrgyzstan, and Uzbekistan (IOM, 2006). Counter to the economic trajectory of its neighbors, Kazakhstan's growing economy led it to be a major destination for migrants from neighboring Central Asian countries as well as remote Kazakhstani villages. These migrants often work in large marketplaces, such as Baraholka Market in the city of Almaty. While the positive influence of migrants on Kazakhstan's economy are well researched (Laruelle, 2008), less is known about the lived experiences of Kazakhstan's migrant population (El-Bassel et al., 2016).

Despite the fact that internal migrants have legal access to services available to non-migrants, research has shown that all migrant groups in Kazakhstan at an increased risk for

discrimination (Laruelle, 2008; Yessenova, 2005). However, there is a dearth of studies examining the potential protective factors – such as social support – among migratory populations in Kazakhstan. The measurement of social support is critical within the field of social work and, potentially, transformative for interventions tailored toward migrant populations. Despite the existence of numerous social support scales (1976), few have been validated among migratory populations outside western contexts (Hall et al., 2014; Seffren et al., 2018; Winstead, Derlega, Lewis, Sanchez-Hucles, & J., 1992).

Inclusive of functional social support – the perception that resources like materials, companionship, or information would be available if needed (Cohen, Underwood, & Gottlieb, 2000) – the ENRICHD Social Support Inventory (ESSI) measures key social support indicators that are applicable across populations in a variety of settings (Mitchell et al., 2003). Moreover, several research studies have incorporated the ESSI has to measure social support of migrant populations (Mergenova et al., 2016b; Okenwa-Emegwa, Saboonchi, Mittendorfer-Rutz, Helgesson, & Tinghög, 2019).

Rigorous validation of the ESSI is critical to draw adequate conclusions associated to its use. For example, if similarly interpreting social support scores across a population (e.g. market vendors), researchers are assuming that a given score is a reflection of the same magnitude of social support no matter the group membership (e.g. non-migrant vs. migrant). However, the implicit construction of social support may vary between groups which would, in turn, highlight that interpretation of scores should not be examined identically between groups (Dimitrov, 2010; Raykov, Marcoulides, & Millsap, 2013; Sass, 2011). Within the population of male vendors in Baraholka Market, the construction and role of social support may vary among groups based on migratory status. For instance, it is plausible that non-migrants would have more family ties

within Almaty compared to both internal and external migrants given their familial roots within Almaty. Conversely, an external migrant may be more reliant on friends or colleagues from the market who are native speakers of his respective language or dialect; while internal migrants might have a wider potential network given their comparative familiarity with the local dialect of Kazakh or Russian. Thus, tests of measurement invariance can ascertain the breadth of applicability for the ESSI, as a latent variable, across migrant groups and within each group across time.

The lack of adequate measurement invariance to inform social work research was articulated by Bowen and Masa and guided by their critical review of invariance studies (2015). Of the 57 articles reviewed only three were determined adequate in conducting invariance testing (Granillo, 2012; Muraki, 1992; Patterson Silver Wolf, Dulmus, Maguin, & Fava, 2014). This finding signifies that there exists great potential to improve the transparency rigorous design approaches for measurement invariance within the field. By examining measurement invariance among male market vendors in Kazakhstan, this paper will not only support future research examining the construction and validity of social support among migrant typologies but also enrich the documented methodological considerations available to social work researchers interested in measurement invariance – particularly for ordinal measures.

Measurement invariance uses structural equation modeling (SEM) to examine the measurement parameters of a latent variable model across time, groups, or both. There are numerous approaches to test measurement invariance, but the analysis within this paper utilizes a specific type of SEM – item response theory (IRT) – in order to reduce estimation error (Pastor, 2003). Measurement invariance grew from analyses with continuous data; however, mirrored measurement invariance approaches for continuous and ordinal data are not recommended

(Bollen, 1989; Jöreskog, 2005). The reason for this are based on the fundamental incongruity in values given that, unlike continuous responses, ordinal responses do not correspond to true quantitative values. Instead, the numerical attributions to ordinal data are ranked but, otherwise, arbitrary (ex. 1 = never, 2 = sometimes, 3 = always). With this in mind, special procedures are recommended to adapt historically continuous measurement invariance for ordinal data. For example, polytomous IRT can incorporate a generalized partial credit model (GPMC) to make tailored assumptions about variable distribution given the likelihood of non-normal distributions of ordinal items (Muraki, 1992).

The purpose this paper is to test the measurement invariance of the ESSi to ensure that the scale's psychometric properties are consistent across the two time points – baseline (t_0) and twelve-month (t_1) – within and across the full sample and five groups (not mutually exclusive) of male market vendors in Almaty, Kazakhstan: external migrants, internal migrants, non-migrants, migrants, and Kazakhstanis. Migrants, who experience cycles of migration because of Push-Pull factors, are expected to have more instable social support than non-migrants; however, less is known about the potential existence of social support within and across these groups. Findings from this measurement paper will inform modeling for the third paper of this dissertation.

Guided by the Push-Pull Theory (Lee, 1966), this paper uses SEM to examine two overarching hypotheses related to measurement invariance:

H_{2.1}: Evidence will support measurement invariance of social support for each migrant group.

H_{2.2}: Evidence will not support measurement invariance of social support across each migrant group.

2.2 Methodology

Study Data

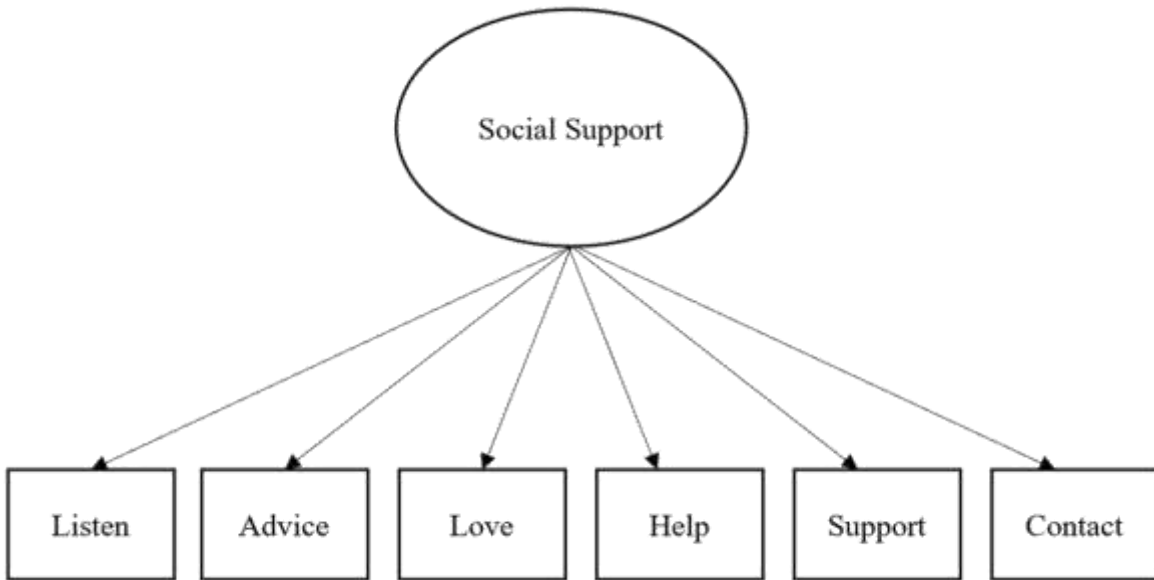
Silk Road is a longitudinal population-based study of 1,342 male market vendors in Kazakhstan. The study aimed to examine the influence of multilevel factors on HIV risk behaviors among a representative sample of male migrant market vendors in the largest marketplace in Almaty, Kazakhstan: Baraholka market. Findings from this study have had important implications for understanding the social determinants of health among migrant workers in Central Asia, and there exists abundant potential to examine the panel nature of this data. Data were collected at baseline, three-month, six-month, and twelve-month time periods, with social support variables collected at baseline (t_0) and twelve-months (t_1). Using respondent driven sampling (RDS), sampling for Silk Road was initiated by 14 seeds inclusive of male market vendors who were either external migrants, internal migrants, or non-migrants. The vast majority (88%, $n = 1181$) of the sample was recruited after the fifth wave. The final sample consisted mostly of external (37%, $n = 502$) and internal (21%, $n = 278$) migrants, with 37% of the sample being non-migrants ($n = 562$) (El-Bassel et al., 2016). Given that endline data was not missing at random (NMAR) for the Uzbek sub-sample, Uzbeks were excluded from analysis for this paper.

Variables

Social support: Perceived social support was measured using the ENRICHD Social Support Instrument (ESSI) (See *Figure 2*). The ESSI is a six-item scale rated on a five-point Likert scale ranging from 1 (“*none of the time*”) to 5 (“*all of the time*”) (Vaglio et al., 2004). The

items included : “Is there someone available to you whom you can count on to listen to you when you need to talk?”, “Is there someone available to give you good advice about a problem?”, “Is there someone available to you who shows you love and affection?”, “Is there someone available to help you with daily chores?”, “Can you count on anyone to provide you with emotional support (talking over problems or helping you make a difficult decision)?”, and “Do you have as much contact as you would like with someone you feel close to, someone in whom you can trust and confide?”. Another Silk Road study supported the internal reliability of the six-item ESSI, using the five-point Likert scale, at t_0 (Cronbach’s alpha of 0.89) (Ward, Shaw, Chang, & El-Bassel, 2018). To address potential interpretive bias of frequency measures across languages, this paper converted the five-item Likert scale into a three-item Likert scale whereby the three scaled frequency responses (“*a little of the time*”, “*some of the time*”, “*most of the time*”) were aggregated into one response category. The two absolute responses (“*none of the time*” and “*all of the time*”) remained as separate response categories. The modifications to the scale also increased fit measures within the full sample and across each group.

Figure 2.1: Latent Construct of Social Support using the ENRICHD Social Support Instrument.



Migrant group status: Migrant typology was assessed using two questions. The first assessed country of birth, to identify Kazakhstanis and non-Kazakhstanis (external migrants). The second question identified Kazakhstanis who moved to Almaty (internal migrants) and those who were born in Almaty (non-migrants). Using the answers to these questions, the following categories were created: non-migrant, internal migrant (Kazakhstani), external migrant (non-Kazakhstani), Kazakhstani (internal migrant and non-migrant) migrant (internal and external migrants). RDS weighting was based on these three primary groups: non-migrants, internal migrants, and external migrants. A sensitivity test was conducted for the non-migrant population, whereby the group was split based on geographical labor mobility. Non-migrants who reportedly spent at least one day outside of Almaty for work purposes between the three-months prior to baseline (t_0) until endline (t_1) were classified as “Mobile not-migrant.” The other group of respondents who never spent a day outside of Almaty for work purposes between the three-months prior to baseline (t_0) until endline (t_1) were classified as “Static not-migrant.”

Analysis

A 1-factor measurement invariance model was performed applying IRT approach to assess equivalence of the social support measure accuracy across time (i.e., longitudinal invariance) using MIRT package in Rstudio (Chalmers, 2012). Unlike some analyses where researchers are interested in statistically different parameter estimates based on hypothesized differences between groups, researchers who utilize measurement invariance tests are often hopeful to *not* find significant differences between models. Thus, significant differences indicate measurement non-invariance of a given model while absence of significance informs a stronger justification for measurement invariance.

In order to test various forms of measurement invariance, the paper first aims to test whether there is invariance within groups across time. If invariance is confirmed, it can be assumed that social support is measured in the same way across time within a given group. The analysis can then test if social support is measured the same way between groups. ESSi assessment at baseline (t_0) and 12-month (t_1) was used. The primary groups were the full sample and five not mutually exclusive groups of male market vendors in Almaty, Kazakhstan: external migrants, internal migrants, non-migrants, migrants, and Kazakhstanis. The non-migrant group was also split into mobile non-migrant and static non-migrant for sensitivity testing (outlined the *Variables* section).

Using a one factor model for each group, measures of fit were conducted on each group at each time. Measures of fit include comparative fit index (CFI), Tucker–Lewis Index (TLI), Standardized Root Mean Squared Residual (SRMSR), and root mean square error of approximation (RMSEA). Whereby acceptable levels of fit are at ≥ 0.05 for CFI and TLI, ≤ 0.08 for RMSEA, and ≤ 0.05 for SRMSR (Hu & Bentler, 1999). The underlying structure of the ESSi was examined for each group across time through item discrimination (a) and item location (b or difficulty parameters). Discrimination parameters indicate how much a given item in the ESSi correlates with the underlying latent factor of social support. Item discrimination values can be very low (0.01-0.34), low (0.35-0.64), moderate (0.65 -1.34), high (1.35 -1.69), or very high (1.70 and above) (Baker, 2001). Item difficulty parameters (b , or location) indicate the amount of social support required to elicit the probability of endorsing an ESSi item at 0.50 across response categories. Two difficulty parameters (b_1 , b_2) were estimated with GPMC. These difficulty parameters correspond with the three possible response categories of the ESSi. The first difficulty parameter (b_1) indicates the level of the underlying latent factor of social support,

where the probability of endorsing an item with a “0 or none of the time” instead of “1 or between none of the time and all of the time” or “2 or all of the time” is 0.50. The second difficulty parameter (b_2) is for the response of < 2 , where the probability of endorsing an item with a “0 or none of the time” or “1 or between none of the time and all of the time” instead of “2 or all of the time” is 0.50.

Testing measurement invariance is a pairwise sequential process whereby the fit of increasingly constrained nested models are compared (Dimitrov, 2010). A multiple imputation approach was used for measurement invariance given the requisite for imputation within the MIRT package, as well as to address missingness of the data across groups (12.81% - 20.14%). Three measures of invariance were included – configural, metric, and strict. Configural invariance examines whether unconstrained t_0 estimates of a one factor model is similar between time points. Metric invariance constrains the factor loadings across time points. Strong invariance constrains factor loadings and intercepts across time points (also called scalar invariance). Strict invariance, comparing error terms, was not tested as changes in a given respondent’s social support across time does not necessarily reflect response bias (ex. respondents may make new friends or start a romantic relationship between time points) (Moreira et al., 2018). Instead, the interest for this paper was the overall invariance of social support within and across groups rather than within individuals of a given group.

Based on findings of non-measurement invariance (*Table 2.6*), a sensitivity test was conducted for two sub-groups of the non-migrant group: mobile non-migrant and static non-migrant (*Table 2.7*). All analyses were repeated for each of these groups, separately, and their respective measurement invariance results are available in *Table 2.8*. A final sensitivity test included examining measurement invariance between groups at baseline (t_0). Longitudinal

measurement invariance across groups was not conducted, given the variability of findings within groups, including fit characteristics, and the weak strength of fit of the measurement invariance between groups at baseline.

2.3 Results

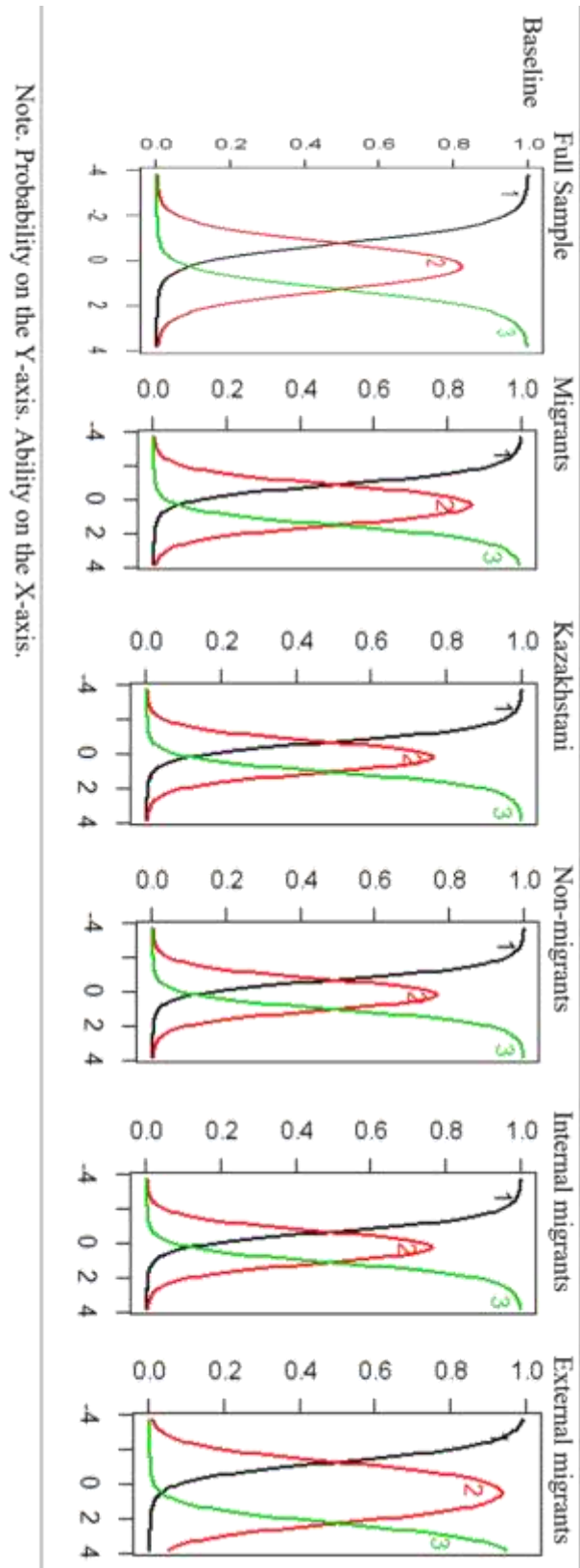
Outputs of model fit are varied. Each timeframe and group met the minimum acceptability of ≥ 0.95 for robust comparative fit index (CFI) and robust Tucker–Lewis Index (TLI) estimates, with the exception of one TLI estimate for non-migrants at t_1 (0.945). The minimum acceptability for Standardized Root Mean Squared Residual (SRMSR) and root mean square error of approximation (RMSEA) estimates is ≤ 0.05 . These thresholds were not met uniformly by any group. Only internal migrants at t_0 met all the fit indices requirements. However, previous research has demonstrated that models do not need to fully meet prespecified fit criteria in order to examine measurement invariance (Byrne, Shavelson, & Muthén, 1989; Raykov, Marcoulides, & Li, 2012).

Table 2.1: Fit indices across timeframes and groups.

	Full sample (n=1121)	Migrants (n=559)	Kazakhstani (n=840)	Non-migrants (n=562)	Internal Migrants (n=278)	External Migrants (n=281)
Baseline						
CFI	0.985	0.987	0.984	0.979	0.991	0.977
TLI	0.975	0.978	0.974	0.964	0.984	0.961
SRMSR	0.038	0.051	0.036	0.041	0.036	0.099
RMSEA	0.097	0.089	0.100	0.118	0.078	0.075
12-month follow up⁺						
	Full sample (n=948)	Migrants (n=467)	Kazakhstani (n=703)	Non-migrants (n=481)	Internal Migrants (n=222)	External Migrants (n=245)
CFI	0.984	0.996	0.979	0.967	0.989	1.000
TLI	0.974	0.993	0.965	0.945	0.981	1.004
SRMSR	0.055	0.080	0.044	0.052	0.091	0.145
RMSEA	0.109	0.055	0.129	0.164	0.091	0.024

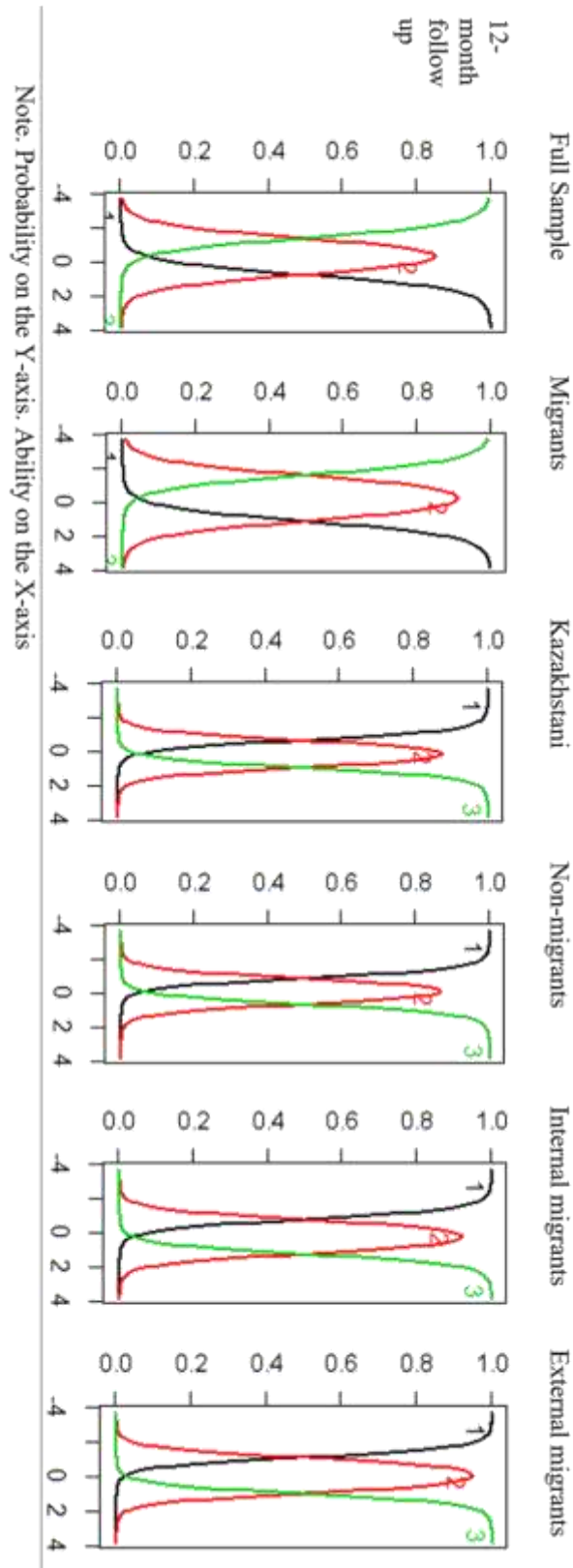
Note. CFI = comparative fit index; TLI = Tucker–Lewis Index; SRMSR = Standardized Root Mean Squared Residual; RMSEA = root mean square error of approximation. ⁺Complete case deletion

Figure 2.2: Item characteristic curves across timeframes at baseline



Note. Probability on the Y-axis. Ability on the X-axis.

Figure 2.3: Item characteristic curves across timeframes at endline



Item characteristic curves (ICC) across time point and groups demonstrate similar probabilities for each response option and acceptable distribution of ability between groups (*Figure 2.2 & Figure 2.3.*). Further, the vast majority of discrimination coefficients for t_0 are below the threshold of 3 for ordinal variables, with several exceptions. However, pairwise comparison of discrimination coefficients, between t_0 and t_1 variables, demonstrate that t_1 coefficients are uniformly larger. Most notably, item ESSI-6 for external migrants exhibits an irregularly high discrimination coefficient. Estimates of v_1 vs v_2 estimates are, on average, higher than v_2 vs v_3 . These uneven outputs indicate a potential skewness toward v_1 .

Table 2.4: Discrimination coefficients and item functioning across groups at baseline.

	Full sample (n=1121)	Migrants (n=559)	Kazakhstani (n=840)	Non-migrants (n=562)	Internal migrants (n=278)	External migrants (n=281)						
	Disc. Coef. v1 vs v2 v2 vs v3	Diff. v1 vs v2 v2 vs v3	Disc. Coef. v1 vs v2 v2 vs v3	Diff. v1 vs v2 v2 vs v3	Disc. Coef. v1 vs v2 v2 vs v3	Diff. v1 vs v2 v2 vs v3						
ESSI – item 1	2.061	1.723 0.907	2.045	1.952 1.121	2.028	1.387 0.828	2.029	1.504 0.653	2.062	1.271 1.053	1.839	2.369 1.899
ESSI – item 2	3.196	3.030 0.008	2.761	3.078 0.183	3.418	2.747 0.003	3.341	2.815 0.298	3.352	2.660 0.369	2.199	3.130 0.690
ESSI – item 3	3.106	3.115 0.776	3.121	3.313 0.706	3.312	2.984 0.723	3.166	3.015 0.987	3.201	2.820 0.370	3.385	3.720 0.373
ESSI – item 4	3.039	2.567 0.949	3.133	2.940 0.988	3.138	2.244 1.187	2.938	2.259 0.784	3.302	2.224 1.834	3.349	3.699 0.749
ESSI – item 5	3.180	2.600 0.825	3.374	3.155 0.919	3.371	2.264 0.934	3.104	2.214 0.644	4.491	2.753 1.583	2.444	3.104 1.107
ESSI – item 6	3.114	2.722 0.803	3.119	3.069 1.096	3.238	2.412 0.875	3.182	2.484 0.483	3.365	2.436 1.553	2.892	3.405 1.283

Note: Multiple imputations were used to adjust for missingness. Differential statistics are reported in absolute values.

Table 2.5: Discrimination coefficients and item functioning across groups at endline.

	Full sample (n=1121)	Migrants (n=559)	Kazakhstani (n=840)	Non-migrants (n=562)	Internal migrants (n=278)	External migrants (n=281)
	Disc. Coef.	Disc. Coef.	Disc. Coef.	Disc. Coef.	Disc. Coef.	Disc. Coef.
	Diff. v1 vs v2 v2 vs v3	Diff. v1 vs v2 v2 vs v3	Diff. v1 vs v2 v2 vs v3	Diff. v1 vs v2 v2 vs v3	Diff. v1 vs v2 v2 vs v3	Diff. v1 vs v2 v2 vs v3
ESSI – item 1	2.299 1.664 1.657	2.151 2.240 1.460	2.379 1.128 1.828	1.054 1.956 2.203	2.193 1.484 1.367	1.939 2.860 1.816
ESSI – item 2	3.145 2.861 0.912	2.674 3.397 0.401	3.347 2.231 1.176	3.804 2.203 1.518	2.938 2.658 0.215	2.638 4.322 1.125
ESSI – item 3	3.489 3.331 0.023	3.151 3.809 0.072	3.774 2.732 0.196	4.087 2.794 0.057	3.444 2.973 0.040	3.256 5.007 0.588
ESSI – item 4	3.508 2.749 1.789	3.523 3.833 1.437	3.541 1.958 2.114	3.815 1.799 2.239	3.274 2.565 1.481	4.228 5.838 1.670
ESSI – item 5	4.215 3.063 1.571	3.864 3.930 0.764	4.851 2.227 2.418	4.739 2.093 2.384	4.498 2.619 1.442	3.320 5.346 0.034
ESSI – item 6	4.362 2.925 2.324	6.005 5.371 1.672	4.424 1.909 2.918	1.681 2.897 4.130	5.480 2.957 2.146	14.134 18.375 1.415

Note: Multiple imputations were used to adjust for missingness. Differential statistics are reported in absolute values.

Measurement invariance between models (configural vs metric and metric vs strict) is not supported if significant differences exist between models ($p\text{-values} \leq 0.05$). Three groups – full sample, migrants, and internal migrants – demonstrated measurement invariance. The group of external migrants did not demonstrate any measurement invariance. While strict vs metric invariance was not significant for the Kazakhstani and non-migrant groups, significance between configural vs metric invariance yielded the strict vs metric comparison extraneous.

Table 2.6: Fit Measurement invariance across time.

Invariance Models	CFI	TLI	RMSEA	p-value
Full sample				
Configural	0.990	0.987	0.050	-
Metric vs Configural	0.988	0.986	0.052	
Strict vs Metric	0.987	0.987	0.050	
Migrants				
Configural	0.996	0.995	0.029	-
Metric vs Configural	0.994	0.993	0.035	
Strict vs Metric	0.992	0.991	0.039	
Kazakhstani				
Configural	0.987	0.982	0.059	-
Metric vs Configural	0.982	0.979	0.065	***
Strict vs Metric	0.001	0.001	0.002	
Non-migrants				
Configural	0.978	0.972	0.077	-
Metric vs Configural	0.973	0.969	0.079	***
Strict vs Metric	0.972	0.971	0.077	
Internal migrants				
Configural	0.994	0.992	0.039	-
Metric vs Configural	0.988	0.987	0.050	
Strict vs Metric	0.989	0.989	0.045	
External migrants				
Configural	0.995	0.993	0.034	-
Metric vs Configural	0.994	0.993	0.033	*
Strict vs Metric	0.994	0.994	0.030	**

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

Fit measures from first sensitivity test on the split non-migrant group (yielding the static non-migrant and mobile non-migrant subgroups) demonstrated that the overall fit of each subgroup was markedly worse than the aggregated non-migrant group. However, the sensitivity test demonstrated measurement invariance (configural vs metric and metric vs strict) within static non-migrants. Albeit weakly, a significant difference was found between the metric and configural models for mobile non-migrants.

Table 2.7: Fit test and measurement invariance across time (sensitivity test).

Invariance Models	CFI	TLI	SRMSR	RMSEA	p-value
Static non-migrants					
Baseline (n=333)	0.963	0.938	0.054	0.167	-
Endline (n=244)	0.964	0.94	0.169	0.134	-
Configural	0.987	0.982	-	0.058	-
Metric vs Configural	0.973	0.969	-	0.077	-
Strict vs Metric	0.973	0.973	-	0.072	-
Mobile non-migrants					
Baseline (n=291)	0.963	0.938	0.054	0.167	-
Endline (n=237)	0.964	0.941	0.062	0.169	-
Configural	0.996	0.995	-	0.034	-
Metric vs Configural	0.986	0.983	-	0.060	*
Strict vs Metric	0.983	0.983	-	0.061	-

Note. ***p<.001 **p<.01 * p<.05. N/A = not applicable because significance met between metric and configural invariance.

The second sensitivity test focused on measurement invariance within groups at baseline. The findings highlighted that measurement invariance was supported for all of the models, except any model that included external migrants.

Table 2.8: Measurement invariance between groups at baseline (sensitivity test).

Invariance Models	CFI	TLI	RMSEA	p-value
Groups 1, 2, 3, 4				
Configural	0.985	0.956	0.046	-
Metric vs Configural	0.953	0.943	0.053	
Strict vs Metric	0.938	0.966	0.041	***
Groups 1, 2, 3				
Configural	0.990	0.971	0.046	-
Metric vs Configural	0.950	0.936	0.069	
Strict vs Metric	0.962	0.977	0.041	
Groups 1, 2, 4				
Configural	0.983	0.948	0.056	-
Metric vs Configural	0.945	0.929	0.065	*
Strict vs Metric	0.929	0.957	0.051	***
Groups 2, 3, 4				
Configural	0.986	0.957	0.052	-
Metric vs Configural	0.986	0.982	0.034	
Strict vs Metric	0.965	0.979	0.036	***
Groups 1 & 2				
Configural	0.987	0.961	0.057	-
Metric vs Configural	0.919	0.879	0.101	
Strict vs Metric	0.918	0.938	0.072	
Groups 1 & 3				
Configural	0.984	0.951	0.064	-
Metric vs Configural	0.909	0.863	0.107	
Strict vs Metric	0.907	0.930	0.062	
Groups 1 & 4				
Configural	0.967	0.902	0.079	-
Metric vs Configural	0.900	0.851	0.097	
Strict vs Metric	0.870	0.903	0.078	***
Groups 2 & 3				
Configural	0.991	0.973	0.048	-
Metric vs Configural	0.987	0.980	0.041	
Strict vs Metric	1.000	1.002	0.000	
Groups 2 & 4				
Configural	0.975	0.926	0.068	-
Metric vs Configural	0.977	0.965	0.047	*
Strict vs Metric	0.896	0.922	0.070	***
Groups 3 & 4				
Configural	0.971	0.913	0.074	-

Metric vs Configural	0.977	0.966	0.046	
Strict vs Metric	0.934	0.950	0.056	***

2.4 Discussion

Given the inherent implications of including scales within scientific research modeling, it is imperative that researchers also examine the validity and construction of the underlining construct of those scales. Testing measurement invariance has an important statistical application for researchers, particularly those interested in the utilization of global scales among diverse populations. Given the gaps in testing measurement invariance of ordinal measures and among populations in LMICS, particularly migrants, this study has a twofold impact in building the scientific literature on employable methodologies for social work researchers as well as building the scientific knowledge related to the measurement of social support across various migrant typologies.

In combination, this paper can inform considerations of analytical techniques for measurement invariance and validity of measures, such as ESSI, on diverse populations, like migrant groups. The methodology clearly outlines the overall approach and considerations to inform potential replicability and transferability. Moreover, the findings highlight that baseline discrimination, difficulties, and fit indices were adequate for baseline data; however, endline findings were weaker. This incongruity may be due to missing data as imputing can result in more conservative estimates. While tests of measurement invariance were run for all groups to maintain consistency, the lack of model fit (ex. for external migrants) would put into question any confirmatory measurement invariance results. When applying the stepwise tests of measurement invariance, configural invariance was evident in some of the samples. Metric and configural invariance was also found for the full sample and migrant group, the only group with both consistent metric and configural invariance across groups was internal migrants. Thus, the findings indicate that ESSI may be an appropriate measure for internal migrants (H_{2.1}). This

finding can support the emerging literature that measures social support of internal migrants (Lin et al., 2016; Lu, 2010). Considerations for the applicability of the ESSI within other groups is included below.

After splitting the non-migrant group into static and mobile non-migrants, this finding supports the interpretation that there is some inherent function of mobility and migration that influences the dimensions of social support (H_{2.2}). While measurement invariance tests are limited among migratory populations, past research has indicated variability of other measures (e.g. personality) between immigrants and non-immigrants (Kim & Sasaki, 2017). The lack of measurement invariance within the external migrant group may also support that finding, albeit less directly. One explanation for the lack of measurement invariance within external migrants may be that prolonged migration may strain social support ties within their home country; hence, the group would, on average, experience a reduction in social support, if those gaps were not filled by new or existing social support, and tests of measurement invariance would not withstand. Another potential factor is that the missingness of t₁ data may be indicative of those migrants returning home who may experience a rejuvenation of their home-based social support. Without data for the group of external migrants who returned home, the estimates are skewed toward external migrants who remained in Almaty.

The overarching findings support, at least, the importance to carefully consider the varied migrant typologies within a population when examining the measurement of social support. Moreover, future social support research that is interested in aggregating migrant and non-migrant groups should examine if/how social support models may vary if disaggregated by migrant groups. Any more advanced models, such as latent class analysis, also necessitate the

examination of how models vary when aggregated across migrant groups versus disaggregated by migrant group.

Findings from this analysis, particularly for internal migrants, can inform future research into the direct and indirect role of social support within the lives of migrants. For instance, research has demonstrated that social support may have a direct association to self-worth and stability (Aneshensel, 1992). In addition to its direct associations, research has also demonstrated that social support may have an indirect role in mitigating the influence of trauma on mental health outcomes among migrants (Lu, 2012). If framed from a resilience and integration lens, future research could inform how social support intersects with the social process of migration, the condition that influence migration itself, and the outcomes associated to migration. On a more preliminary level, the continued exploration of psychometric properties could enable a more refined social support score (adjusted) that researchers could utilize if interested in a integrating all migrant groups within a model. Alternatively, future research could also examine the partial invariance across groups (esp. external migrant and non-migrant). Partial measurement invariance is often deemed an acceptable model analysis highlights that the proportion of noninvariant parameters to all parameters tested is small (Dimitrov, 2010; Sass, 2011). Along those lines, Dimitrov (2010) indicated that “less than 20% freed parameters seems acceptable in practical applications: (p. 127). A partial measurement invariance model may be particularly applicable for the external migrant group, given the incongruous discrimination coefficients for item-6 of the ESSI (Table 2.3).

2.5 Limitations

While the study is focuses only on males, market vendors in Almaty are rarely female. However, future research would benefit from including females within the market structure as well as including members of market vendor households (including intimate partners and spouses) to support a more comprehensive understanding of the social system. Given the need to use RDS to access the hidden populations within market vendors (i.e. migrants), the complex sampling design limits the representative nature of the results. The models of this paper were not weighted in order to best reflect the social support within this sample, but that same rationale further complicates the representativeness of the findings. Additionally, it was found that the Uzbek's were not missing at random (NMAR) at t_1 ; thus, the Uzbek group was dropped from all models that included external migrants. Another decision that was made with the sample in mind was adjusting the original five-item scale to a three-item scale. As mentioned in the measurement section, this adjustment was made to unify and varied understanding of subjective terms (i.e. “*a little of the time*”, “*some of the time*”, “*most of the time*”) across the various languages of the survey. The added value of this modification was seen by improved measures of fit across the sample and each group, especially RMSEA estimates. Tests of measurement invariance should be reconducted in any future analysis that examines the ESSi among a group with a singular language.

2.6 Conclusion

This paper is unique in its explicit examination of measurement invariance of social support among market vendors in Central Asia, particularly Kazakhstan. Whereas previous research has focused on baseline social support among this population, this paper contributed to

examining construction and validity of the measurement across time and between migrant groups (Ward, Shaw, Chang, & El-Bassel, 2018). The findings highlight that factors associated to mobility and migration influence the validity of the ESSI. Thus, future research and practice should consider how the construction and function of social support may also vary between groups impacted by mobility or migration. Given the growing interest of migration research, this study is timely in its feasibility to inform future research related to measurement of social support and the application of that measurement within analytical models and intervention research. While this research focuses on male market vendors in Almaty, this research methodology will have wide applicability and transferability in other migration settings, especially within LMICs.

Paper 3: Examining the role of social support for internal migrants in Almaty, Kazakhstan: Evidence using structural equation modeling

3.1 Introduction

The majority of external and internal migrants reside in low- and middle-income countries (LMICs) (UN, 2017). However, migration research tend to focus on high income countries (HICs) and, more specifically, immigrants to HICs. This is despite the fact that, with an estimated 740 million internal migrants (UNDP, 2009), three-in-every-four migrants across the globe is an internal migrant (either, forced or voluntary) (UN, 2017; UNDP, 2009). The prioritization of research interests on external migrants, or immigrants, also persists within LMICs, like Kazakhstan. Part of the dominating interest in Kazakhstan's emigration and immigration may be due, in part, to the volatility of external migration in the years leading up to and preceding Kazakhstan's independence in 1991. However, interregional migration – a type of internal migration – has been a consistent behavior across Kazakhstan's history.

The more recent migration from remote villages and towns to urban centers may be driven by Kazakhstan's growing and increasingly urbanized economy (EBRD, 2010; Wandel & Kazbogarova, 2009). Thus, what has historically been a migration related to pastoral livelihoods is now more commonly migration in search of employment within modern commerce as a result

of high regional economic and social disparities (Anderson & Pomfret, 2004; Dillinger, 2007). These disparities, in turn, influence the steady flow of internal migration into more economically prosperous regions (Aldashev & Dietz, 2011), such as the oil-rich regions of Atyrau and Mangistau or the commercial-centers of Almaty and Astana. According to Lee's Push-Pull theory, migration decision making is determined through the net of individual push and pull factors. Livelihoods can act both as a push and a pull (Lee, 1966), Urban areas of Kazakhstan, may pull potential migrants with the hopes of economic gains. On the other hand, the dearth of economic opportunity in rural areas of Kazakhstan may push residents who desire employment. Between 2000 and 2010, nearly one-percent of Kazakhstan's population (138,750 persons, on average) migrated each year within Kazakhstan (Anderson & Pomfret, 2004). These internal migrants often find work within large marketplaces, such as Baraholka Market in the city of Almaty. The limited research that does exist on internal migration in Kazakhstan tends to focus on the positive impact of internal migration on Kazakhstan's economy (Laruelle, 2008); however, the lived experiences of Kazakhstan's internal migrant population and the implications of those experiences are underexamined (El-Bassel et al., 2016).

Similar to other migrants across the globe, internal migrants in Kazakhstan are likely to encounter potentially traumatic events (PTEs) – broadly defined for the purpose of this paper as distressing experiences that can result in psychological harm – both directly and indirectly related to their migration (IOM, 2016). PTEs directly related to migration can include separation from family members, violence and exploitation during migration, and financial depletion. Moreover, research in Kazakhstan highlights that all migrant groups are at an increased risk for discrimination which may, in turn, increase their vulnerability to discrimination-related PTEs such as violence victimization or social exclusion (Laruelle, 2008; Yessenova, 2005). Given that

Almaty has the nation's highest unemployment rate (Aldashev & Dietz, 2011), internal migrants in Almaty may be additionally vulnerable to exploitative practices by employers due to the higher numbers of job-seekers, and resulting competition for employment, compared to other regions (i.e. *oblasts*) in Kazakhstan. The variance and confluence of PTEs have the potential to influence mental health outcomes across one's life. For example, research in other former Soviet Union countries demonstrates that PTEs can contribute to feelings of alienation and a low sense of personal control (Bobak, Pikkhart, Hertzman, Rose, & Marmot, 1998; Cockerham, Hinote, & Abbott, 2006).

Importantly, adverse mental health outcomes (incl. such as depression) can be mitigated by the informal availability of functional social support (e.g. the fluid availability for transference of tangible or intangible material between friends and family members) (Shishehgar, Gholizadeh, DiGiacomo, Green, & Davidson, 2017; Simich, Beiser, & Mawani, 2003; Stewart et al., 2011), but a limited number of studies examine the instrumental role of social support among migrants in LMICs and none focus exclusively on internal migrants. The measurement and examination of informal functional social support (i.e. social support) of internal migrants, including internal migrants in Almaty, is limited. However, there exists a body of scientific knowledge that underscores the potential influence of social support on mental health (van Breda, 2018). The Stress-Buffering Hypothesis by Cohen indicate that social support can be both directly (*Main Effect*) and indirectly (*Buffer Effect*) correlate to improved mental health outcomes (Cohen, Underwood, & Gottlieb, 2000; Cohen & Wills, 1985; Thoits, 1982).

To date, only one paper identifies that social support provides as both a Main Effect and Buffer Effect among this population in Kazakhstan (Ward, Shaw, Chang, & El-Bassel, 2018). This cross-sectional paper focused on both migrant and non-migrant workers in Almaty, and

strengthened the justification for examining the role of social support within Almaty's internal migrant population and for incorporating more advanced models to examine longitudinal Main Effect and Buffer Effect theories. Thus far, no paper has utilized longitudinal data to examine causality and temporal pathways of depressive symptomology among internal migrants in Kazakhstan and no paper has focused explicitly on social support among this population. This is important because cross-sectional data has distinct temporal limitations, while utilizing longitudinal data can elucidate causal pathways. Moreover, longitudinal data can also identify any pattern changes related to behaviors or PTE exposures. Identifying these pattern changes can not only improve the understanding of lived experiences of internal migrants but also highlight, for example, the types of PTEs experienced as a result of being an internal migrant. Thus, there remains an opportunity for research to examine the complexity of lived experiences of the internal migrant community and its connectivity to health and behavioral outcomes. Findings can build upon van Brenda's definition of resilience (2018) to examine how the social system (i.e. social support) functions as proxy for resilience and its ability to thwart adversity (i.e. PTE) among migrant populations.

The prevalence of depression in Kazakhstan is 4% (WHO, 2017), and the country maintains one of the highest suicide rates worldwide (WHO, 2014). There has also been an increase in men seeking mental health services (IWPR, 2016), but mental health policies and services are lacking and many primary health care doctors and nurses in Kazakhstan report not receiving any mental health training in the past five years (WHO, 2011). Although mental health prevalence rates among migrants, internal or external, are not available in Kazakhstan, collectively, these factors lead to concerns about the capacity for the mental healthcare system to withstand increased demand, suggesting a need for research that examines the intersection of

PTEs, depressive symptomology, and social support in this context. This paper, guided by the Push-Pull Theory (Lee, 1966), Stress-Buffering Hypothesis (Cohen & Wills, 1985), and van Brenda's conceptualization of resilience (2018) examines the confluence of associations between PTEs, social support, and depressive symptomology among male internal migrants in Kazakhstan. Structural equation modeling (SEM) is used to examine two overarching hypotheses related to the "Main Effect" and "Buffer Effect":

Main Effect:

H_{3.1a}: Male internal migrants living in Almaty with a greater number of PTEs are more to have higher depressive symptomology than male internal migrants living in Almaty with fewer PTEs.

H_{3.1b}: Male internal migrants living in Almaty who have stronger availability of social support are less likely to have higher depressive symptomology than male internal migrants living in Almaty who have weaker availability of social support class.

Buffer Effect:

H_{3.2a}: The direct association of PTEs to higher depressive symptomology, among male internal migrants living in Almaty at baseline (t₀) and endline (t₁), is moderated by social support class.

H_{3.2b}: The direct association of PTEs (t₀) to higher depressive symptomology (t₁) across time, among male internal migrants living in Almaty, is moderated by social support class.

3.2 Methodology

Data Collection

Silk Road is a longitudinal population-based study of non-migrant and migrant market vendors in Almaty, Kazakhstan (El-Bassel et al., 2016). The primary aim of the study was to elucidate statistical relationships between mobility, risk environment, and behavioral, physical, and mental health among males working in Baraholka market. Data were collected at baseline, three-month, six-month, and 12-month time periods. Only baseline (t_0) and endline (t_1) were used for this paper because certain variables (ex. social support) were only collected at those timepoints. Using respondent driven sampling (RDS), sampling was initiated by 14 seeds inclusive of male market vendors who were either external migrants, internal migrants, or non-migrants. The study yielded a representative sample of 1,342 male migrant market vendors. The vast majority (88%, $n = 1181$) of the sample was recruited after the fifth wave. The final sample consisted mostly of migrants who were either external (37%, $n = 502$) or internal (21%, $n = 278$) migrants, with 37% of the sample being non-migrants ($n = 562$) (El-Bassel et al., 2016). Despite the Silk Road data also including non-migrants and external migrants, this paper focused only on internal migrants. The rationale for limiting the sample to internal migrants is that internal migrants were the only of the three groups to demonstrated measurement invariance of social support across time (See dissertation paper #2). Missing data of the internal migrant sample was 20.14% ($n = 56$) at t_1 . There was no missing data of the internal migrant sample at t_0 . Numerous studies have been published from the baseline data (El-Bassel et al., 2016; Ismayilova et al., 2014; Mergenova et al., 2016a; Michalopoulos et al., 2018; Ward, Shaw, Chang, & El-Bassel,

2018); yet there remains myriad opportunities to examine variables across time, given the panel nature of this data.

Measurement

Depressive symptomology: The latent variable of depressive symptomology was measured across time (t_0 and t_1) through the six-item Brief Symptom Inventory (BSI) (Boulet & Boss, 1991). Based on a 7-day recall, respondents answer the frequency of occurrence of symptoms using a 5-point likert scale. Symptoms include “Thoughts of ending your life,” “Feeling lonely even when you are with people,” “Feeling sad,” “Feeling no interest in things,” “Feeling hopeless about the future,” and “Feelings of worthlessness.” Lower scores represent less depressive symptomology. Acceptable internal reliability coefficient of the items of the BSI was determined at t_0 and t_1 ($\alpha \geq .7$) and only one eigenvalue from polychoric factor analysis greater than one at both at t_0 and t_1 .

Social support: Similar to previous Silk Road papers (Mergenova et al., 2016a; Ward, Shaw, Chang, & El-Bassel, 2018), perceived social support was measured across time using the ENRICH Social Support Instrument (ESSI) and excluded the binary question examining marital status (Vaglio et al., 2004). The ESSI uses a Likert scale to measure six items related to functional social support (incl. emotional support). Acceptable internal reliability coefficient of the items of the ESSI scale was determined at t_0 and t_1 ($\alpha \geq .7$) and only one eigenvalue from polychoric factor analysis was greater than one at both at t_0 and t_1 . Classes of social support – low, moderate, moderate – were derived from six questions related to perceived functional social support from friends and family

Potentially Traumatic Events: The PTE variable was informed by another Silk Road paper (Ward, Shaw, Chang, & El-Bassel, 2018) that measured baseline PTEs using a modified version of the dichotomous Stressful Life Events scale. Higher scores indicate more PTEs, with the highest score being a 12. Questions from the Stressful Life Events Scale include “Were you ever in a life-threatening accident,” “Was physical force or a weapon ever used against you in a robbery or mugging,” “Have you ever been present when another person was killed, seriously injured, or sexually or physically assaulted,” and “Have you ever been in any other situation where you were seriously injured or your life was in danger (e.g., involved in military combat or living in a war zone).” (Goodman, Corcoran, Turner, Yuan, & Green, 1998). Additional policing questions were included to assess PTEs related specifically to migrants, such as being questioned by migration police or state officials since working at Baraholka market or being arrested by migration police or state officials. The count variable of PTEs at t_0 and t_1 were utilized within models given the increase in reported count of PTEs at t_1 compared to t_0 .

Sociodemographic characteristics: Aligning with the baseline Buffer Effect paper from Silk Road (Ward, Shaw, Chang, & El-Bassel, 2018), three sociodemographic characteristics were incorporated as exogenous predictor variables and included age, income level, and marital status. Age (in years) was a continuous variable. Dichotomous variables included marital status, and income level. Marital status was dichotomized to married (marriage, common law marriage, and de facto marriage) or not married (divorced, cohabitating, widowed, or single). Income level was dichotomized according to whether respondents were above or below the living wage in Kazakhstan in 2011 (15,999 tenge per month) (Kazakhstan, 2014). Marital status and income level were measured at t_0 and t_1 .

Data Analysis

Given the presence of missing data at t_1 (20.14%; $n = 56$) and concerns related estimate errors for imputation, missing data were imputed using multiple imputations (MI) in the reported analysis. Moreover, a sensitivity test was conducted to replicate the models in Table 3.4 using listwise deletion to support comparability of outcomes with and without MI, as well as adjusted and unadjusted. The models in Table 3.4 include adjusted MI and unadjusted MI. The models in Table 3.5 include adjusted listwise deletion and unadjusted listwise deletion. All analyses were conducted using Stata (version 15).

Polychoric analyses were used, instead of the usual covariance matrix preferred for continuous variables, to address the ordinality of observed latent variables of depressive symptomology and social support. Through assessing correlation of each dyad of variables for depressive symptomology and social support under the theoretical assumption of normal distribution, polychoric analyses confirmed a one factor model for both depressive symptomology and social support at both t_0 and t_1 . Social support items at t_0 and t_1 were merged and the LCA function was used to determine the total number of social support classes ($N=3$) within the one factor model of social support (i.e. selecting the output with lowest BIC and AIC via the GSEM command in Stata). Classes of social support – low, moderate, and high – were derived from the six ordinal questions in the ESSi. Importantly, MI was not utilized for the LCA given the potential variance of number of classes derived from the multiple sets of imputed data; thus, missing social support classes were imputed after the LCA.

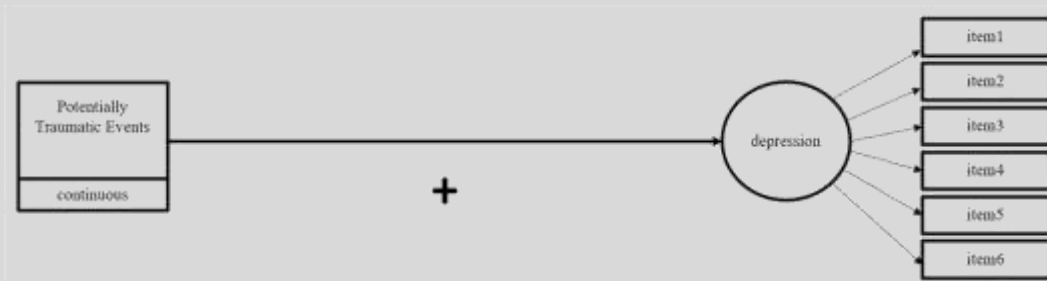
The hypothesis of a direct association (“Main Effect”) was analyzed through SEM analyses of PTE counts and the latent measure of depressive symptomology, as well as social support class and depressive symptomology. The direct association between change in social

support and depressive symptomology was also examined. The Main Effect hypothesis was also examined through adjusted models without interaction, as well as within interaction models. The hypotheses of an indirect association (“Buffer Effect”) was analyzed through interaction models. See Figure 1 for visualization of hypotheses. Six SEM models were included in Tables 4 & 5. The interaction models were conducted to determine if social support significantly moderated the influence of PTE on depressive symptomology within each period of time - at t_0 in model 1 and at t_1 in model 2) - and across time (models 3 and 4) – between t_0 and t_1 . Two three-way interactions were also conducted (models 5 & 6) through interacting PTE, social support class, and change in social support. Participants’ age, income level, and marital status were included in all direct effect and indirect effect models as control variables – specified as exogenous predictor variables. Table 3.4 represents the findings using multiple imputations. Table 3.5 represents a sensitivity test of examining the models in Table 3.4 using listwise deletion instead of MI.

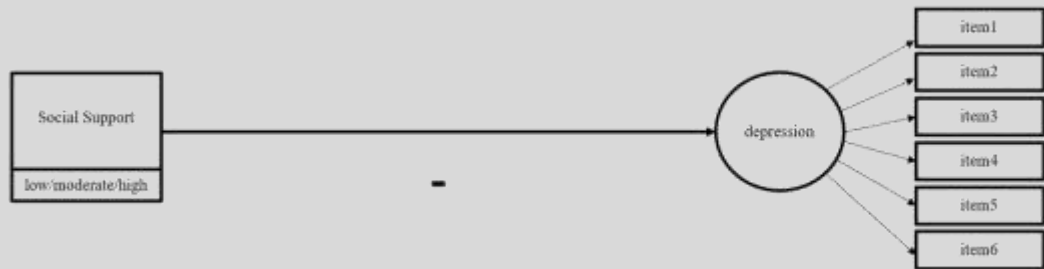
Figure 3.1: Hypotheses for social support, PMLD, and depression.

Main Effect:

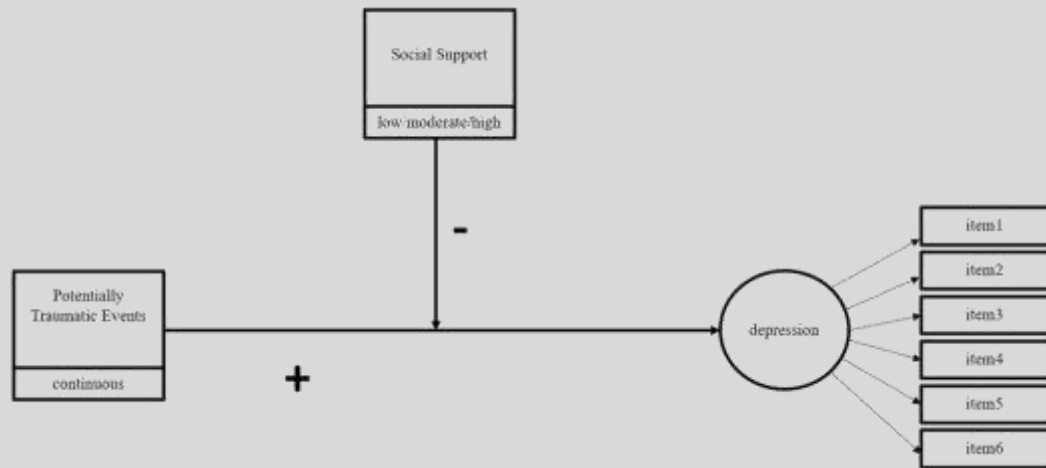
H_{3.1a}: Male internal migrants living in Almaty_ with a greater number of PTEs are more to have higher depression symptomology than male internal migrants living in Almaty with fewer PTEs.



H_{3.1b}: Male internal migrants living in Almaty_ who have stronger availability of social support are less likely to have higher depression symptomology than male internal migrants living in Almaty who have weaker availability of social support class.



Buffer Effect:



H_{3.2a}: The direct association of PTEs to higher depression symptomology, among male internal migrants living in Almaty at baseline (t_0) and endline (t_1), is moderated by social support class.

H_{3.2b}: The direct association of PTEs (t_0) to higher depression symptomology (t_1) across time, among male internal migrants living in Almaty, is moderated by social support class.

3.3 Results

Descriptive analysis of the sample indicate the average age of participants was 23.92 (SD: 6.29) at t_0 . Most men were unmarried (t_0 : 70.86%; t_1 : 67.57%) and lived below the poverty line (t_0 : 82.73%; t_1 : 85.14%). More men were married at t_1 than t_0 , and more men were below the poverty line at t_1 than t_0 . On average, the score per individual item of the BSI were lower at t_1 than t_0 . The average number of PTEs experienced increased from t_0 (1.81) to t_1 (2.22) but the average remained low. However, the high standard deviation of average PTEs at both t_0 (1.93) and t_1 (2.15) highlight that PTE exposure existed in a range.

Table 3.1: Descriptive information of study sample.

Variable	Label	Baseline (t ₀) n = 278			Endline (t ₁) n = 222		
		n	mean	SD	n	mean	SD
Age		261	23.92	6.29	-	-	-
PTE		278	1.81	1.93	222	2.22	2.15
Depression	Thoughts of ending your life	278	0.51	1.21	222	0.54	1.26
	Feeling lonely even when you are with people	278	0.86	1.34	222	0.68	1.28
	Feeling sad	278	0.64	1.24	222	0.63	1.23
	Feeling no interest in things	278	0.72	1.32	222	0.63	1.25
	Feeling hopeless about the future	278	0.59	1.19	222	0.58	1.16
	Feelings of worthlessness	278	0.69	1.21	222	0.64	1.21
Variable	Options	n	%	n	%		
Married	No	197	70.86%	-	150	67.57%	-
	Yes	81	29.14%	-	72	32.43%	-
Income	Below 15999 KZ tenge	230	82.73%	-	189	85.14%	-
	Above 15999 KZ tenge	48	17.27%	-	33	14.86%	-

After confirming a one factor model using polychoric analysis, an LCA identified three “classes” of social support. The author designated the classes as low social support (class 1), moderate social support (class 2), and high social support (class 3). On average when compared to the other class, responses in the low social support class (class 1, n = 101) were more likely to report “never” for all items when compared to the moderate and high class. Following this trend, respondents in the moderate social support class (class 2, n = 302) were more likely, on average, to report “sometimes to often” for all items when compared when compared to the other classes. Respondents in the high social support class (class 3, n = 67) were more likely, on average, to report “always” for all items when compared when compared to the other classes.

Table 3.2: Characteristic distributions across latent classes of social support among internal migrants.

Variable	Options	Class 1 Margin	Class 2 Margin	Class 3 Margin
Item 1	None of the time	83.62%	12.78%	11.34%
	A little to most of the time	12.34%	82.26%	17.94%
	All of the time	4.05%	4.96%	70.71%
Item 2	None of the time	80.75%	3.64%	3.24%
	A little to most of the time	11.55%	92.05%	11.56%
	All of the time	7.70%	4.31%	85.20%
Item 3	None of the time	79.37%	3.01%	1.46%
	A little to most of the time	12.58%	89.60%	7.43%
	All of the time	8.04%	7.39%	91.11%
Item 4	None of the time	80.59%	8.51%	2.65%
	A little to most of the time	16.63%	89.90%	31.59%
	All of the time	2.78%	1.60%	65.76%
Item 5	None of the time	90.38%	8.05%	1.33%
	A little to most of the time	8.57%	88.77%	12.79%
	All of the time	1.05%	3.17%	85.88%
Item 6	None of the time	89.50%	7.20%	1.94%
	A little to most of the time	8.55%	89.97%	25.48%
	All of the time	1.96%	2.84%	72.58%

Class distribution at t_0 was mostly in the moderate class (59.35%, $n=165$) with the remaining respondents in either the high (19.42%, $n=54$) or low (17.63%, $n=49$) class. When examining the latent class transition of social support, the majority of men remained within the same class (49.10%), while 21.62% improved and 29.28% reduced their social support class between t_0 to t_1 . Individuals in the low (66.67%) and moderate (62.32%) were more likely to remain within the same latent social support class than those who were in the high class (22.22%). Thus, the social support class with the most mobility from t_0 was the group with high social support, as 77.78% had a reduction in social support across time (t_0 to t_1). Similarly, on average, the strength per individual item of social support (ESSI) reduced across time.

Table 3.3: Descriptive information of social support among study population.

Variable	Baseline t ₀ (n = 278)			Endline t ₁ (n = 222)		
	n	mean	SD	n	mean	SD
Social Support	278	0.91	0.68	222	0.86	0.63
	278	1.01	0.64	222	0.98	0.62
	278	1.06	0.65	222	1.00	0.63
	278	0.91	0.61	222	0.90	0.59
	278	0.95	0.64	222	0.91	0.65
	278	0.93	0.60	222	0.89	0.64
Variable	Options	n	%	n	%	
Social Support Class	Low	49	17.63%	52	23.42%	-
	Moderate	165	59.35%	137	61.71%	-
	High	54	19.42%	13	5.85%	-
Social Support Change (Δ)	Improvement ($+\Delta$)	-	-	48	21.62%	-
	Static	-	-	109	49.10%	-
	Reduction ($-\Delta$)	-	-	65	29.28%	-
Improvement ($+\Delta$)	Low (t ₀)	-	-	34	15.32%	-
	Moderate (t ₀)	-	-	30	21.74%	-
Static	Low (t ₀)	-	-	26	66.67%	-
	Moderate (t ₀)	-	-	86	62.32%	-
	High (t ₀)	-	-	10	22.22%	-
Reduction ($-\Delta$)	Moderate (t ₀)	-	-	22	15.94%	-
	High (t ₀)	-	-	35	77.78%	-

Using SEM to test the Main Effect hypotheses (H_{3.1a} & H_{3.1b}), the association between the count PTE variable and the latent depressive symptomology (BSI) outcome were examined to confirm a direct association between PTE and depressive symptomology at both t_0 and t_1 (Table 3.4). The PTE variable was significantly associated with higher depressive symptomology ($p < 0.001$), in all unadjusted models. Furthermore, respondents with the high social support class had significantly lower depressive symptomology than those with the low social support class in each model ($p < 0.001$). The Main Effect hypothesis for the relationship between PTE and depressive symptomology across time, as well as social support and depressive symptomology, at t_0 and t_1 were supported by the analysis.

When examining the Main Effect hypothesis within the adjusted models, the association between the count PTE variable and the latent variable of depressive symptomology demonstrated a continued direct association between PTE and increased depressive symptomology at both t_0 and t_1 ($p < 0.001$ for models 1, 2, and 4; $p < 0.01$ for models 3, 5, and 6). Respondents within the high social support class continued to have significantly lower depressive symptomology compared to those in the low social support class across models 1, 2, 5, and 6 ($p < 0.001$). In those same models, respondents with the moderate social support class had significantly lower depressive symptomology than those in the low social support class ($p < 0.01$ or $p < 0.05$). In Models 5 and 6, which included the Main Effect of change in social support (Δ), a direct association between improvement ($+\Delta$) and reduction ($-\Delta$) in social support between t_0 and t_1 was found in both models, whereby an improvement in social support was significantly associated with lower depressive symptomology ($p < 0.01$) and a reduction in social support was significantly associated to higher depressive symptomology ($p < 0.01$).

An additional SEM model was used to test the Buffer Effect hypotheses (H_{3.2a} & H_{3.2b}) through an examination of the moderating role of social support on the association of PTEs and depressive symptomology. By running interaction terms on PTE and social support classes in models 1-4 and interaction terms on PTE, social support classes, and change in social support across time, the findings of the interaction models consistently demonstrated that PTE was a significant predictor for higher depressive symptomology across all six (6) models (range in $p < 0.05$ to < 0.001).

The first and second interaction models relied exclusively on data at either t_0 (model 1) or t_1 (model 2). Both interaction models indicate that there is also a direct effect of high social support predicting lower depressive symptomology ($p < 0.05$); however, neither interaction term was significant. The third and fourth interaction models relied on the longitudinal data of both t_0 and t_1 . The third interaction model includes the examination of t_0 PTE and t_0 social support on the outcome of depressive symptomology at t_1 . The fourth interaction model includes the examination of t_1 PTE and t_0 social support on the outcome of depressive symptomology at t_1 . Both models demonstrate that interaction terms significantly moderated the influence of PTE on depressive symptomology (interaction term for moderate social support and PTE: $p < 0.05$; interaction term for high social support and PTE: $p < 0.01$).

The fifth and sixth interaction model included a three-way interaction term between 1) PTE, 2) t_0 social support class, and 3) change in social support between t_0 and t_1 . Model 5 included PTE at t_0 while model 6 included PTE at t_1 . Neither of the models demonstrated significance in their interaction terms. Reduction in social support was only significantly associated to depressive symptomology in model 5, where it was associated to higher depressive symptomology ($p < 0.05$). However, both the high social support class ($p < 0.05$) and

improvement in social support class ($p < 0.05$) were associated with lower depressive symptomology.

Table 3.4: Moderation analysis of social support on the association of potentially traumatic events and depression (imputed).

Model	Depression outcome (b)	Options	Imputed (unadjusted [†])				Imputed (adjusted ^{††})				Imputed (adjusted ^{†††})			
			coef.	Sig.	CI	CI	coef.	Sig.	CI	CI	coef.	Sig.	CI	CI
1	PTE Social Support (b) Interaction	Class 1 (low)	0.73	***	0.45	1.00	0.77	***	0.48	1.06	1.12	***	0.58	1.66
		Class 2 (moderate)	-0.59	-	-1.51	0.32	-1.38	**	-2.34	-0.42	-0.77	-	-1.93	0.38
		Class 3 (high)	-2.70	***	-4.11	-1.28	-2.55	***	-3.93	-1.17	-1.69	*	-3.27	-0.10
PTE(b) / low(b)			-	-	-	-	-	-	-	-0.40	-	-0.89	0.09	
PTE(b) / moderate(b)			-	-	-	-	-	-	-	-0.60	-	-1.29	0.10	
Depression outcome (t)														
Variable			Options				Options				Options			
2	PTE (t) Social Support (b) Interaction	Class 1 (low)	0.52	***	0.25	0.79	0.47	***	0.22	0.73	0.73	**	0.29	1.16
		Class 2 (moderate)	-1.51	**	-2.62	-0.40	-1.35	*	-2.43	-0.28	-0.44	-	-1.87	0.98
		Class 3 (high)	-4.68	***	-7.13	-2.23	-4.72	***	-7.23	-2.20	-3.24	*	-6.58	-0.09
PTE(t) / low(t)			-	-	-	-	-	-	-	-0.36	-	-0.81	0.09	
PTE(t) / moderate(t)			-	-	-	-	-	-	-	-0.59	-	-1.70	0.52	
3	PTE (b) Social Support (b) Interaction	Class 1 (low)	0.73	***	0.45	1.00	0.38	**	0.12	0.65	1.23	**	0.45	2.01
		Class 2 (moderate)	-0.59	-	-1.51	0.32	-0.07	-	-1.26	1.12	1.10	-	-0.54	2.74
		Class 3 (high)	-2.70	***	-4.11	-1.28	-1.24	-	-2.74	0.26	0.79	-	-1.09	2.67
PTE(b) / low(b)			-	-	-	-	-	-	-	-0.87	*	-1.64	-0.10	
PTE(b) / moderate(b)			-	-	-	-	-	-	-	-1.56	**	-2.65	-0.47	
4	PTE (t) Social Support (b) Interaction	Class 1 (low)	0.52	***	0.25	0.79	0.48	***	0.22	0.75	1.19	**	0.49	1.89
		Class 2 (moderate)	-0.59	-	-1.51	0.32	0.01	-	-1.17	1.19	1.58	-	-0.28	3.44
		Class 3 (high)	-2.70	***	-4.11	-1.28	-1.15	-	-1.17	1.19	1.21	-	-0.90	3.32
PTE(t) / low(t)			-	-	-	-	-	-	-	-0.76	*	-1.43	-0.09	
PTE(t) / moderate(t)			-	-	-	-	-	-	-	-1.22	**	-2.09	-0.35	
5	PTE (b) Social Support (b) Change in Social Support (Δ) 3-way interaction	Class 1 (low)	0.73	***	0.45	1.00	0.38	**	0.12	0.64	0.37	*	0.06	0.69
		Class 2 (moderate)	-0.59	-	-1.51	0.32	-1.90	*	-3.39	-0.40	-1.14	-	-2.78	0.49
		Class 3 (high)	-2.70	***	-4.11	-1.28	-4.52	***	-6.90	-2.13	-2.80	*	-5.15	-0.45
Improvement (+Δ)			-1.57	*	-2.87	-0.28	-2.53	**	-4.11	-0.95	-2.08	*	-4.15	0.00
Reduction (-Δ)			0.47	-	-0.54	1.48	1.97	**	0.62	3.32	1.61	*	0.04	3.27
PTE(b) / low/Improvement (+Δ)			-	-	-	-	-	-	-	0.50	-	-0.32	1.32	
PTE(b) / moderate/Improvement (+Δ)			-	-	-	-	-	-	-	-0.50	-	-1.59	0.59	
PTE(b) / moderate/Reduction (-Δ)			-	-	-	-	-	-	-	0.22	-	-0.35	0.80	
PTE(b) / high/Reduction (-Δ)			-	-	-	-	-	-	-	-0.65	-	-1.49	0.20	
6	PTE (t) Social Support (b) Change in Social Support (Δ) Interaction (3-way)	Class 1 (low)	0.52	***	0.25	0.79	0.44	**	0.19	0.69	0.39	*	0.09	0.70
		Class 2 (moderate)	-0.59	-	-1.51	0.32	-1.72	*	-3.18	-0.27	-0.79	-	-2.43	0.85
		Class 3 (high)	-2.70	***	-4.11	-1.28	-4.27	***	-6.61	-1.93	-2.63	*	-5.01	-0.26
Improvement (+Δ)			-1.57	*	-2.87	-0.28	-2.47	**	-4.04	-0.90	-2.44	*	-4.77	-0.12
Reduction (-Δ)			0.47	-	-0.54	1.48	1.81	**	0.49	3.14	1.52	-	-0.14	3.18
PTE(b) / low/Improvement (+Δ)			-	-	-	-	-	-	-	0.64	-	-0.09	1.37	
PTE(b) / moderate/Improvement (+Δ)			-	-	-	-	-	-	-	-0.40	-	-1.51	0.71	
PTE(b) / moderate/Reduction (-Δ)			-	-	-	-	-	-	-	0.13	-	-0.34	0.61	
PTE(b) / high/Reduction (-Δ)			-	-	-	-	-	-	-	-0.35	-	-0.98	0.28	

Results are statistically significant at *p<0.05, **p<0.01, and ***p<0.001 (Sig.) Latent factors not included in table. Coef = coefficient, Sig = significance, CI = confidence interval.

†Separate models were conducted for each variable.

††Models were adjusted based on the age, income amount, and marital status reported at the corresponding Depression time (t) or (t).

Table 3.5 represents a sensitivity test of the MI approach used in Table 3.4, whereby all missing data were dropped (listwise deletion) rather than imputed. Results between Tables 4 & 5 were consistent in the direction of common significant associations. However, variations in significant findings were found in some models. When examining the unadjusted models, there were two terms that were significant in the MI model but not the listwise deletion model. Conversely, there were five terms that were significant in the listwise deletion model but not the MI model. When examining the unadjusted models without interactions, there was a full match in the variables indicated as significant between the MI models and respective listwise deletion models. When examining the unadjusted models without interactions, there weren't any terms that were significant in the MI model but not the listwise deletion model. Conversely, there was one term in model 6 (reduction in social support) that was significant in the listwise deletion model but not the MI model.

Table 3.5: Moderation analysis of social support on the association of potentially traumatic events and depression (listwise deletion).

Model	Depression outcome (t ₀) Variable	Options	Listwise (unadjusted ^a)				Listwise (adjusted ^b)				Listwise (adjusted ^c)			
			coef	Sig.	CI	CI	coef	Sig.	CI	CI	coef	Sig.	CI	CI
1	PTE	Class 1 (low)	0.73	***	0.45	1.00	0.81	***	0.48	1.15	1.17	***	0.56	1.77
	Social Support (t ₀)	Class 2 (moderate)	-0.59	-	-1.51	0.32	-1.74	**	-2.88	-0.60	-1.07	-	2.41	0.28
	Interaction	Class 3 (high)	-2.70	***	-4.11	-1.28	-2.99	***	-4.63	-1.35	-2.23	*	-4.10	-0.36
		PTE(t ₀) / low(t ₀)	-	-	-	-	-	-	-	-0.43	-	-0.98	0.13	
		PTE(t ₀) / moderate(t ₀)	-	-	-	-	-	-	-	-0.52	-	-1.32	0.27	
Depression outcome (t ₁)														
Variable														
2	PTE (t ₁)	Class 1 (low)	0.52	***	0.25	0.79	0.45	**	0.20	0.70	0.67	**	0.26	1.09
	Social Support (t ₁)	Class 2 (moderate)	-1.51	**	-2.62	-0.40	-1.58	**	-2.69	-0.46	-0.75	-	-2.19	0.70
	Interaction	Class 3 (high)	-4.68	***	-7.13	-2.23	-5.30	***	-8.10	-2.50	-4.07	*	-7.71	-0.43
		PTE(t ₁) / low(t ₁)	-	-	-	-	-	-	-	-0.32	-	-0.77	0.12	
		PTE(t ₁) / moderate(t ₁)	-	-	-	-	-	-	-	-0.50	-	-1.68	0.69	
3	PTE (t ₀)	Class 1 (low)	0.73	***	0.45	1.00	0.39	**	0.12	0.66	1.15	**	0.39	1.91
	Social Support (t ₀)	Class 2 (moderate)	-0.59	-	-1.51	0.32	-0.06	-	-1.26	1.14	1.07	-	-0.60	2.74
	Interaction	Class 3 (high)	-2.70	***	-4.11	-1.28	-1.19	-	-2.69	0.31	0.62	-	-1.26	2.50
		PTE(t ₀) / low(t ₀)	-	-	-	-	-	-	-	-0.80	*	-1.56	-0.04	
		PTE(t ₀) / moderate(t ₀)	-	-	-	-	-	-	-	-1.39	**	-2.43	-0.34	
4	PTE (t ₁)	Class 1 (low)	0.52	***	0.25	0.79	0.47	**	0.20	0.73	1.13	**	0.45	1.81
	Social Support (t ₁)	Class 2 (moderate)	-0.59	-	-1.51	0.32	0.04	-	-1.15	1.23	1.58	-	-0.31	3.46
	Interaction	Class 3 (high)	-2.70	***	-4.11	-1.28	-1.09	-	-2.58	0.41	1.11	-	-1.00	3.21
		PTE(t ₁) / low(t ₁)	-	-	-	-	-	-	-	-0.71	*	-1.38	-0.05	
		PTE(t ₁) / moderate(t ₁)	-	-	-	-	-	-	-	-1.11	**	-1.97	-0.26	
5	PTE (t ₀)	Class 1 (low)	0.73	***	0.45	1.00	0.38	**	0.12	0.64	0.33	*	0.02	0.65
	Social Support (t ₀)	Class 2 (moderate)	-0.59	-	-1.51	0.32	-2.10	**	-3.67	-0.54	-1.41	-	-3.10	0.28
	Change in Social Support (Δ)	Class 3 (high)	-2.70	***	-4.11	-1.28	-4.77	***	-7.24	-2.30	-3.28	**	-5.71	-0.85
		Improvement (+Δ)	-1.57	*	-2.87	-0.28	-2.72	**	-4.41	-1.03	-2.42	*	-4.61	-0.24
		Reduction (-Δ)	0.47	-	-0.54	1.48	2.20	**	0.80	3.60	1.70	*	0.05	3.36
		PTE(t ₀) / low/Improvement (+Δ)	-	-	-	-	-	-	-	0.49	-	-0.31	1.30	
		PTE(t ₀) / moderate/Improvement (+Δ)	-	-	-	-	-	-	-	-0.45	-	-1.78	0.89	
		PTE(t ₀) / moderate/Reduction (-Δ)	-	-	-	-	-	-	-	0.28	-	-0.29	0.85	
		PTE(t ₀) / high/Reduction (-Δ)	-	-	-	-	-	-	-	-0.46	-	-1.27	0.35	
6	PTE (t ₁)	Class 1 (low)	0.52	***	0.25	0.79	0.42	**	0.17	0.67	0.35	*	0.04	0.66
	Social Support (t ₁)	Class 2 (moderate)	-0.59	-	-1.51	0.32	-1.90	*	-3.43	-0.38	-1.07	-	-2.75	0.61
	Change in Social Support (Δ)	Class 3 (high)	-2.70	***	-4.11	-1.28	-4.53	***	-6.95	-2.11	-3.11	*	-5.56	-0.66
		Improvement (+Δ)	-1.57	*	-2.87	-0.28	-2.66	**	-4.34	-0.97	-2.86	*	-5.33	-0.40
		Reduction (-Δ)	0.47	-	-0.54	1.48	2.04	**	0.67	3.42	1.69	*	0.01	3.36
		PTE(t ₁) / low/Improvement (+Δ)	-	-	-	-	-	-	-	0.66	-	-0.07	1.38	
		PTE(t ₁) / moderate/Improvement (+Δ)	-	-	-	-	-	-	-	-0.34	-	-1.68	1.00	
		PTE(t ₁) / moderate/Reduction (-Δ)	-	-	-	-	-	-	-	0.16	-	-0.31	0.63	
		PTE(t ₁) / high/Reduction (-Δ)	-	-	-	-	-	-	-	-0.25	-	-0.88	0.37	

Results are statistically significant at * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$ (Sig.). Latent factors not included in table. Coef = coefficient, Sig. = significance, CI = confidence interval.

^aSeparate models were conducted for each variable.

^bModels were adjusted based on the age, income amount, and marital status reported at the corresponding Depression time (t₀ or t₁).

3.4 Discussion

Given the steady rate of internal migration within Kazakhstan (Anderson & Pomfret, 2004) and overarching mental health needs in the country (WHO, 2014, 2017), this paper examines the intersection of PTE, depressive symptomology, and social support among male internal migrants in Almaty. It is first study to longitudinally focus on these themes explicitly within the internal migrant population in Kazakhstan. Findings from this paper support the hypothesized importance of social support among internal migrants in Kazakhstan who experience PTEs and have important implications for intervention, policy, and research in this context.

When examining the first hypothesis ($H_{3.1a}$) across all models, the PTE variable was significantly associated with higher depressive symptomology ($p < 0.001$). These results are consistent with previous research examining the direct association of trauma experience to depression (Kessler, 1997; Monroe, Harkness, Simons, & Thase, 2001; Muscatell, Slavich, Monroe, & Gotlib, 2009). Similarly the second hypothesis ($H_{3.1b}$) was supported in the unadjusted models, as high social support was significantly associated with lower depressive symptomology ($p < 0.001$). These results align with previous research examining the Main Effect of social support and depression (El-Bassel, Guterman, Bargal, & Su, 1998; Kim & Noh, 2016; Ward, Shaw, Chang, & El-Bassel, 2018); however, the moderate social support class was not significantly associated to a variance in depressive symptomology. Thus, the findings from this paper in relation to H_{1b} are only significant when contrasting the high social support class to the low social support class.

Findings from the second set of hypotheses related to the Buffer Effect ($H_{3.2a}$ & $H_{3.2b}$) are less conclusive. Both hypothesize that the consequences associated to PTEs (i.e. higher

depressive symptomology) would be lessened for internal migrants with stronger social support. However, the interaction term of social support class and PTE was only significant in models 3 and 4. The inconsistency of this finding runs counter to previous research identifying social support as a strong and consistent moderator (Cohen & Wills, 1985; Raffaelli, Andrade, Sanchezz-Armass, Edwards, & Aradillas-Garcia, 2012; Ward, Shaw, Chang, & El-Bassel, 2018). However, it is worth noting that while the exact function of social support is not supported in this research, social support is either directly or indirectly associated to depressive symptomology in all of the adjusted models. Therefore, there remains a need for researchers to examine the potential benefit of social support cultivation among for internal migrants in Kazakhstan.

Global research has advocated for social support to be integrated within mental health interventions (Ozbay et al., 2007; Paykel, 1994); yet, interventions that aim to build social support among this sample may also benefit from leveraging existing market forces through economic interventions. For example, the social enterprise model or social impact bonds are often viewed sustainable and financially viable for governments interesting in addressing social support but cognizant of intervention cost-benefit calculations (Banulescu-Bogdan, 2020). These market-centered inventions may also appeal to Kazakhstan's population of internal migrants given their existing market involvement and potential stigma toward an explicit intervention for depression. Numerous market-driven interventions have been piloted in Europe among unemployed immigrants with the aim to improve social functioning and wellbeing; these interventions may be modified for application in Almaty. Most pertinent may be the Social ENTrepreneurship for IMmigrants project (SENTIM) in Spain, Italy, Slovenia and Greece (Erasmus⁺, 2016). It provides as a potential model given it aims to not only promote employability but also address discrimination and social exclusion while building social ties.

Aligning to a syndemic system of care (Gonzalez-Guarda, 2013; Mendenhall, Kohrt, Norris, Ndeti, & Prabhakaran, 2017; Willen, Knipper, Abadía-Barrero, & Davidovitch, 2017), it may be efficacious for mental health policies in Kazakhstan to advocate for cross-training of mental health and social service practitioners. These trainings would enable practitioners to be more readily available to meet the imminent depressive symptomology of internal migrants while also addressing underlining social support gaps. Given the current period of mental policy reform in Kazakhstan, the government could build upon the social support and social integration policies within European countries (Li, 2018; OECD, 2016; Simic et al., 2018) to establish a Central Asian model for considerations of internal migrant mental health within policies. Building resilience among internal migrants, through integrating the cultivation of social support within mental health policies, could provide as a sustainable and innovative approach to addressing the emerging mental health needs (esp. depression) within Kazakhstan.

3.5 Limitations

The findings of this paper should be viewed alongside several limitations. First, this study did not dichotomize the BSI to determine a depression threshold. Previous research has utilized t-scores to set data-driven thresholds of BSI outcomes at 63 (Derogatis, 2001), but using the t-score approach identifies relative depression rather than actual depression. Given the lack of depression prevalence data among the sample, a conservative approach was taken to examine the overall relationship to depressive symptomology as a latent variable rather than the binary outcome of depression using t-scores for the BSI. However, future research may benefit from incorporating a measure with defined and validated thresholds for depression or clinical diagnoses of depression. The second major limitation was related to the sample. While findings

between imputed and non-imputed models were generally consistent, there were several fluctuations in significance. These fluctuations may be reflective of the small sample size or omitted variable bias. A final and important limitation is that baseline characteristics were not controlled for in the Main Effect at t_1 and longitudinal Buffer Effect Models. Incorporating the latent variable of depressive symptomology at t_0 rendered models 2-6 as overidentified, so models 2-6 in Tables 4 and 5 did not control for depressive symptomology at t_0 (nor income or marital status at t_0). However, a test of congruence between t_0 and t_1 was conducted to highlight that there was not a significant difference in depressive symptomology the across time within the sample. Thus, the authors assumed that controlling for depressive symptomology at t_0 would not drastically influence the models.

3.6 Conclusion

Despite its limitations of this paper, the findings add to the literature by first reinforcing previous research identifying the Main Effect of social support and PTEs on depressive symptomology. Moreover, the findings demonstrated that, under certain conditions, social support may have instrumental value in “buffering” the influence of PTE on depressive symptomology among the sample of internal migrants. Through examining both the Main Effect and Buffer Effect of social support, this paper provides a foundational examination of how and to what extent social support influences depressive symptomology among male internal migrants working in Baraholka Market. Findings from this paper have the potential of to inform interventions that leverage existing market systems to strengthen social ties and mental health policies to integrate resilience framing.

Conclusion and Discussion: Major Findings and Implication for Practice, Intervention, Policy and Future Research

This dissertation focuses on examining the role of social support among two groups of urban migrants: Syrian refugee women in Jordan (Women ASPIRE study; PI: Nabila El-Bassel & Neeraj Kaushal) and male market vendors in Kazakhstan (Silk Road study; PI: Nabila El-Bassel). It aimed to describe social support; identify the direct association of social support and depressive symptomology, and; examine the moderating role of social support on depressive symptomology related to PTEs among two samples of urban migrants. Both the Women ASPIRE and Silk Road studies focus on urban migrants; however, the variations between samples (ex. men vs women, internal migrants vs refugees, Central Asia vs Middle East) allowed this dissertation to examine hypotheses across diverse populations of migrants to expand the consideration and application of scientific social support literature.

This dissertation consists of three papers. The first paper examined social support, PTEs, and depression among female urban refugees in Jordan and displaced by the Syrian Civil War. The second paper examined patterns of social support across time and between non-migrant and migrant typologies among male market vendors in Almaty, Kazakhstan. The third paper examined social support, PTEs, and depression among internal migrant market vendors in Almaty, Kazakhstan. The dissertation was guided by the following three major hypotheses.

The dissertation's first hypothesis (H₁) indicated that social support among urban migrants can be measured as a latent construct and validated as distinct latent classes. In both samples, social support was conceptualized as informal availability of functional social support. However, the measurement of social support varied in the survey instruments for Women ASPIRE and Silk Road, as one study used individual social support items (Women ASPIRE) and the other study used the ESSi measure (Silk Road). The measurement findings from Papers 1-3 build upon the emerging literature examining the validity and variations of social support measures among migrants (Djundeva & Ellwardt, 2019; Hombrados-Mendieta et al., 2019; Wang et al., 2010).

The dissertation's second hypothesis (H₂) indicated that urban migrants who report with strong social support will have less depressive outcomes than migrants with lower social support (i.e. "Main Effect"). Papers 1 and 3 of this dissertation highlights a direct correlation between social support and depressive variables. These Main Effect findings align with previous research examining the Main Effect of social support and depression (El-Bassel, Guterman, Bargal, & Su, 1998; Kim & Noh, 2016; Ward, Shaw, Chang, & El-Bassel, 2018); however, the moderate social support class from Paper 3 was not significantly associated to a variance in depressive symptomology. Thus, the findings from Paper 3 in regard to H₂ are only significant when contrasting the high social support class to the low social support class.

The dissertation's third hypothesis (H₃) indicated that the direct relationship of PTEs to depressive outcomes would be significantly moderated by the strength of social support. Papers 1 and 3 of this dissertation examined the "Buffer Effect" of social support on the association of PTEs predictors and depressive outcomes. Paper 1 supported the function of social support as a buffer; on average, PTE scores had higher odds of yielding depression outcomes for individuals

with low social support (aOR: 4.06; CI: 2.39-6.07) relative to individuals with moderate social support (aOR: 2.07; CI: 1.37-3.13). The Buffer Effect findings in Paper 3 were less conclusive, as the interaction term of social support class and PTE was only significant in models 3 and 4. The inconsistency of this finding runs counter to previous research identifying social support as a strong and consistent moderator (Cohen & Wills, 1985; Raffaelli, Andrade, Sanchezz-Armass, Edwards, & Aradillas-Garcia, 2012; Ward et al., 2018).

Findings by Paper

Paper 1: Examining the role of social support for Syrian refugee women in Jordan: Evidence using latent class analysis and structural equation modeling

PTEs were common, with most pervasive PTEs as poverty (mean: 4.14; SD: 1.20) and fears of being forced to return to Syria (mean: 4.08; SD: 1.31). With previous research demonstrating poverty's adverse effects on functioning among adolescent Syrian refugee (Chen et al., 2019), the simple descriptive finding of the pervasiveness of poverty within this sample warrants further investigation. Furthermore, the majority of women met the criteria for depression (63.04%). This far exceeds the average depression prevalence rates among refugees and asylum seekers that range from 4% (Fazel, Wheeler, & Danesh, 2005) to 44% (Lindert, Ehrenstein, Priebe, Mielck, & Brähler, 2009); this further emphasizes a critical need to address depressive symptomologies. The average number of friends or family members available for social support among Syrian refugee women was low, ranging from 0.48 persons (SD: 1.19) for legal support to 2.20 persons (SD: 1.98) for talking when feeling upset, angry, or in need of help. Two classes of social support were identified through LCA – the classifications of “low social support” and “moderate social support” were given to these classes given the resounding absence

of respondents meeting the Dunbar threshold of five persons available per need (Hill & Dunbar, 2003). The LCA was conducted after confirming an acceptable internal reliability ($\alpha \geq .7$) and only one eigenvalue from polychoric factor analysis greater than one.

Both Main Effect and Buffer Effect hypotheses were supported, as the adjusted odds ratios of both PMLD (aOR: 2.87; CIs: 2.10-3.93; $p < 0.001$) and high social support (aOR: 0.57; CIs: 0.38-0.84; $p < 0.01$) were associated with depression. Moreover, findings indicated social support moderates the relationship of PMLD on depression between women in the low class (aOR: 4.06; CIs: 2.39-6.87; $p < 0.001$) and moderate class (aOR: 2.07; CIs: 1.37-3.13; $p < 0.01$) of social support ($p < 0.05$). These findings support emerging scientific knowledge on the role of functional social support among refugees by indicating not only that PTE and social support have direct associations to depression, but that social support has instrumental value in mitigating the influence of PMLD on depression outcomes among the sample (Cohen & Wills, 1985; El-Bassel, Guterman, Bargal, & Su, 1998; Kim & Noh, 2016; Raffaelli, Andrade, Sanchezz-Armass, Edwards, & Aradillas-Garcia, 2012; Ward, Shaw, Chang, & El-Bassel, 2018). By identifying a Main Effect and Buffer Effect of social support on depression, these findings contribute toward emerging scientific knowledge related to the implications of a resiliency approach for refugees in relation to practice, intervention, and policy.

Paper 2: Examining social support among male market vendors in Almaty, Kazakhstan:

Modeling measurement invariance of an ordinal scale

Outputs of model fit of the ESSi measure (Mitchell et al., 2003) in Paper 2 varied. Each timeframe and group met the minimum acceptability of ≥ 0.95 for robust comparative fit index (CFI) and robust Tucker–Lewis Index (TLI) estimates, with the exception of one TLI estimate

for non-migrants at t_1 (0.945) (Hu & Bentler, 1999). Item characteristic curves (ICC) across time points and groups demonstrate similar probabilities for each response option and acceptable distribution of ability between groups. Further, the majority of discrimination coefficients for t_0 are below the acceptable threshold of 3 for ordinal variables. Three groups – full sample, migrants, and internal migrants – demonstrated measurement invariance across time from the IRT models (Muraki, 1992; Pastor, 2003). Tests of measurement invariance within groups at baseline highlighted that measurement invariance was supported for all of the models, except any model that included external migrants. One potential explanation for the lack of measurement invariance within external migrants is that prolonged migration may strain social support ties within their home country (Djundeva & Ellwardt, 2019); hence, the group would, on average, experience a reduction in social support, if those gaps were not filled by new or existing social support, and tests of measurement invariance would not withstand.

The findings highlight that factors associated to mobility and migration influence the construction of social support between groups and, potentially, within groups. Thus, future research should consider how the construction and function of social support (e.g. ESSI) may also vary between groups impacted by mobility or migration (Mergenova et al., 2016; Okenwa-Emegwa, Saboonchi, Mittendorfer-Rutz, Helgesson, & Tinghög, 2019). While this research focuses on male market vendors in Almaty, this research methodology has wide applicability and transferability in other migration settings, especially in LMICs. Given the growing interest in the social process of migration, this paper is timely in its feasibility to inform future research related to measurement of social support and the application of that measurement within analytical models and intervention research.

Paper 3: Examining the role of social support for internal migrants in Kazakhstan: Evidence using structural equation modeling

At baseline, the average age of males in this study was 23.92 (SD: 6.29) years, over a quarter (29.14%, n=81) were married, and the majority (82.73%, n=230) had an income below the living wage in Kazakhstan. Using the ESSI measure, three classes of social support – low, moderate, and high – were identified using LCA. While one other study has used LCA to measure social support (Koelet & de Valk, 2016), this paper appears that this is the first time LCA has been used for the ESSI measure. The LCA was conducted after confirming both an acceptable internal reliability ($\alpha \geq .7$) and only one eigenvalue from polychoric factor analysis greater than one. Class distribution at t_0 was mostly in the moderate class (59.35%, n=165) with the remaining respondents in either the high (19.42%, n=54) or low (17.63%, n=49) class. Nearly half of respondents did not transition social support class between t_0 and t_1 (49.10%, n=109). This challenges the notion that social support changes across time (Djundeva & Ellwardt, 2019; Koelet & de Valk, 2016), by at least identifying a period in time when social support may stagnate among internal migrants.

The “high” class of social support was a significant predictor for lower outcomes of depressive symptomology in the unadjusted models ($p < 0.001$). This finding supported previous research that identified a Main Effect of social support on depressive outcomes (El-Bassel et al., 1998; Kim & Noh, 2016; Ward et al., 2018). Furthermore, the indirect effect of social support was inconsistent within the adjusted two-way inaction models and unsupported in the three-way interaction models. The inconsistency of this finding runs counter to previous research identifying social support as a strong and consistent moderator (Cohen & Wills, 1985; Raffaelli et al., 2012; Ward et al., 2018). However, it is worth noting that while the exact function of

social support is not supported in this research, social support is either directly or indirectly associated to depressive symptomology in all of the adjusted models. Therefore, there remains a need for researchers to examine the potential benefit of social support cultivation among for internal migrants in Kazakhstan and the findings demonstrated that, under certain conditions, social support may have instrumental value in “buffering” the influence of PTE on depressive symptomology among the sample of internal migrants. Through examining both the Main Effect and Buffer Effect of social support on depressive symptomology, these findings inform the understanding of how and to what extent social support influences depressive symptomology among male internal migrants who have experienced PTEs and work in Baraholka Market in Almaty, Kazakhstan. Findings from this paper have the potential to inform market-based mental health interventions that leverage existing market systems to strengthen social ties and mental health policies to integrate resilience framing.

Implications for Practice and Intervention

One of the most evident and impactful implications from the conceptualization and findings of dissertation is the need to improve measurement of social support given the gaps in available social support literature related to measurement of social support among migrants (Hombrados-Mendieta et al., 2019). This need is compounded by the stated importance of measurement within program and policy evaluations: as recently as 2020, the Migration Policy Institute highlighted that, “...programs are often evaluated on the basis of easy-to-quantify metrics such as self-sufficiency or employment outcomes (and typically only on a very short time horizon). Evaluations may therefore miss participants’ progress toward important markers of social integration [and resilience], such as strength of social networks or feelings of belonging,

that may be more worthwhile indicators for some newcomers.” (Banulescu-Bogdan, 2020). In order to more accurately measure these important markers, like social support, social work research must build the scientific literature related to population-specific measures, especially for ordinal measures (Bowen & Masa, 2015) of social support. Paper 2 highlights how ordinal measures can be used for tests of measurement invariance, while also highlighting that the validity of a measure (e.g. ESSI) among a population (i.e. male market vendors) may not equate measurement invariance between groups (e.g. migrants vs. non-migrants). Papers 1 and 3 demonstrated how social support among urban migrant populations may incorporate LCA to identify distinct classes of social support rather than using a scaled measure, which cannot differentiate groupings of social support (ex. high vs. low).

Moreover, researchers should consider the potential Main Effect and Buffer Effect of social support on depressive symptomology, especially those related to depression, within social support interventions (Hernández-Plaza, Alonso-Morillejo, & Pozo-Muñoz, 2006). While research has demonstrated that the use of formal social support may be low within migrant populations (Aroian, Wu, & Tran, 2005; Hernandez, Pozo, & Alonso-Morillejo, 2004; Moon, Lubben, & Villa, 1998), reliance on informal social support has been shown to be a more readily accessed source for help seeking behavior (Hernandez et al., 2004; Lynam, 1985). Building from this knowledge, four levels of interventions that leverage informal social support have been proposed by Hernandez-Plaza, Alonso-Morillejo and Pozo-Munoz (2006). These four levels include dyadic interventions, social network interventions, mutual aid groups and community interventions. Dyadic interventions incorporate new sources of support to promote interpersonal exchange; social network interventions include the identification and mobilization of existing networks to improve the exchange of support provided within a given network; interventions

with mutual aid groups establish connection between migrants and community members to exchange mutual support, and; community interventions integrate migrants in the identification of needs, consideration of need solving strategies, and implementation of related interventions. While each of these intervention typologies may be applicable for migrant populations, the discussions within Papers 1 and 3 argue for the prioritization of community-based interventions to build social ties. With an overarching objective to build social support among urban migrants, community-based interventions could serve multiple purposes including improving social cohesion, integration, and self-sufficiency. A potentially appealing avenue for intervention among governments may be community-based interventions that leverage market forces, given the higher prioritization of short-term economic gains over long-term social gains.

Implications for Policy

Many Organization for Economic Co-operation and Development (OECD) countries have prioritized the reduction in social exclusion among migrants; however, policy approaches related to social support among migrants are globally inconsistent (Banulescu-Bogdan, 2020). LMICs should leverage the recent transformations in OECD countries regarding considerations of social support within migrant economic policies and also integrate social support within mental health policies and mainstream across migration policies. For examples of economic policies in OECD countries that leverage social support, both Austria and Germany have contributed portions of their integration budgets to particularly disadvantaged migrant groups to foster empowerment programming (Li, 2018). These policies exemplify how building social ties among migrant groups can leverage a government's ultimate economic aim of accelerating labor market engagement. However, there also exists importance and potential to infuse social support

components within mental health and other cross-cutting policies. Important barriers – structural barrier; time and resource barriers; life-cycle barriers; cultural barriers, and; socioemotional barriers – should be addressed with LMICs policies in order to adequately transfer policies to LMICs settings and sustain results among migrants and the host community (Banulescu-Bogdan, 2020).

In Jordan, the country has a unique role within the Syrian Response Effort and, thus, an opportunity to lead the humanitarian policy realm in regard to social support. Building upon existing efforts, amendments to the Jordan Compact could include mainstream social support indicators across its economic activities. Jordanian policies could also expand their considerations of social support by developing a Ministry with an explicit focus on migration or develop a migration department within its Ministry of Social Welfare. Turkey’s newly created Directorate of Psychosocial Support during Migration and Emergencies within the Ministry of Family and Social Policy provides as an example of how governments in the region can direct resources to the integration of depressive symptomology and social support through MHPSS ministries.

In Kazakhstan, there is a historical precedence for its openness to policy reforms, as evident by the market-oriented reforms of the early 2000’s that supported a booming economy (including trade liberalization and the promotion of entrepreneurship) (Wandel & Kazbogarova, 2009). More recently, the Kazakhstani government is spearheading efforts to reform its mental health system (UNICEF, 2018). The ongoing mental health reform presents a critical opportunity for research, including findings from this dissertation, to inform evidence-based mental health policies in Kazakhstan. Mental health policies in Kazakhstan should consider the critical linkage between PTEs and increased depression symptomology among internal migrants. Policies may,

in turn, advocate mental health responses to prioritize response care for internal migrants who experience high rates of PTEs or prevention care for those who are vulnerable to PTEs. Despite freedom of movement within Kazakhstan, some public services (e.g. hospitals and schools) are restricted only to residents. Most internal migration is to either Almaty or Asanta and, unlike internal migrants from Astana who are often from neighboring regions, internal migrants to Almaty are from a wide range of nearby and far-reaching regions (Aldashev & Dietz, 2011). Therefore, it is reasonable to hypothesize that internal migrants in Almaty are less likely than those in Asanta to return home to receive public services that are not available in Almaty. Thus, it may be useful to expand policies to consider how mobility and migration impede access to publicly available services.

Limitations

Important limitations should be considered when reviewing this dissertation. Notably, the two sets of data included urban migrants from different genders, migrant typologies, areas of origin, and areas of destination, among other sociodemographic characteristics. Moreover, the SEM models and temporality varied between papers. The incongruencies facilitated a wider consideration of the role and application of social support; however the results should not be directly contrasted given the variations between samples and methodology. One of the major limitations of both studies is the generalizability of findings. While the a clinic-based systematic sampling approach of Women ASPIRE is advantageous in clinic settings, to both integrate some degree of randomness while balancing practicalities needed to ensure enrollment through expedient data collection (Elfil & Negida, 2017; Suresh, Thomas, & Suresh, 2011), the sample frame of women accessing health clinics limits the generalizability to the wider population of

Syrian women who are refugees in Jordan. Not all Syrian refugee women access health clinics and, even those that do, may access clinics beyond those offered at IFH or IRC. Thus, the implications of findings from paper 1 should consider the sampling limitations for the Women ASPIRE study. Similarly, the respondent driven sampling (RDS) approach for Silk Road limits the generalizability of findings. The RDS approach supports access to hidden or hard-to-reach populations, such as migrants (Keygnaert et al., 2014; Khamsiriwatchara et al., 2011; Qiu et al., 2011); however, it does not yield a random sample. Thus, the implications of findings from papers 2 and 3 consider the sampling limitations for the Silk Road study.

Directions for Future Research

This dissertation expands pathways for evidence-based intervention research among urban migrants. Employment is often viewed as the most effective way to expedite the development of social ties among migrants; however, employment is not the only mechanism available to facilitate the establishment or growth of social support. Some migrants may already be working and others may experience disadvantages to attaining employment; thus, interventions that are cognizant of the broader social context may be well-suited to foster the growth of social support among migrants.

Given the widespread acceptance toward economic programming, interventions that are “work-adjacent” may be appealing among governments that are often hesitant to initiate programs without short-term cost savings. As recommended by the Migration Policy Institute (Banulescu-Bogdan, 2020), “work-adjacent” activities can range from informal businesses (such as crafts or cooking) to volunteering and can promote the idea of being “empowered not assisted” (Desiderio, 2016). The key appeal of these work-adjacent activities to governments is that they are seen as direct contributions to the broader community as they focus on “parts of the

labor market that may be overlooked by formal employment services.” (Banulescu-Bogdan, 2020). In order to also build social support, an intervention that is “work-adjacent” could integrate a peer component such as host community mentorship. This research could examine the pathways through which this set of interventions affects different migrant typologies alongside context-specific policies that address social support, while also examining its impact on host community participants and measures of social cohesion. Study variables should not only measure social support, but also key socio-demographic variables (ex. age, education level, employment status, and marital status) and measures of perceived social cohesion (incl. discrimination, stigma, and availability of social support from host community).

Importantly, any social support research among migrants would benefit from preemptively integrating a mixed-methods approach to establish or pre-validating a social support measure before its quantitative application. Following the lead of how the Harvard Trauma Questionnaire (HTQ) (Mollica et al., 1992) has become a well-regarded trauma measure among forced migrants, a mixed-methods IRT approach could be utilized for the measurement of social support among migrants. Before implementing the intervention, the cornerstone of the proposed research would begin with a systematic review to identify the social support characteristics arising in qualitative literature to create an item bank. Then both qualitative (i.e., cognitive interviews) and quantitative (i.e., classical test theory and item response theory) methods could be used to establish, content, criterion and construct validity (Michalopoulos et al., 2019) of the a social support measure among the identified population of migrants for the work-adjacent intervention. After establishing this pre-validated social support measure, the measure could be implemented within the work-adjacent intervention to critically examine pathways to building social support and mitigating adverse mental health among migrants.

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Appendix A: Supplementary material for Paper 1

Appendix A.1: Latent factor analysis of post migration living difficulties[†]

	coefficient	sig	
PMLD 1	0.73	***	PMLD
PMLD 2	0.67	***	
PMLD 3	0.94	***	
PMLD 4	1.14	***	
PMLD 5	1.46	***	
PMLD 6	1.09	***	
PMLD 7	1.03	***	
PMLD 8	1.38	***	
PMLD 9	1.47	***	
PMLD 10	1.90	***	
PMLD 11	1.30	***	
PMLD 12	1.00	***	

[†]Significant denoted by * if $p < 0.05$, ** if $p < 0.01$, and* if $p < 0.001$.

Appendix A.2: Latent factor analysis of social support[†]

	coefficient	sig	
SS 1	1.55	***	Social Support
SS 2	1.94	***	
SS 3	0.99	***	
SS 4	0.88	***	
SS 5	1.40	***	
SS 6	0.79	***	
SS 7	1.01	***	

[†]Significant denoted by * if $p < 0.05$, ** if $p < 0.01$, and *** if $p < 0.001$.

Appendix B: Supplementary material for Paper 3

Appendix B.1: Latent factor analysis of social support[†]

	coefficient	sig	
SS 1	2.31	***	Social Support
SS 2	3.30	***	
SS 3	3.38	***	
SS 4	3.34	***	
SS 5	4.67	***	
SS 6	3.98	***	

[†]ESSI items from t_0 and t_1 are included in this analysis. Missing data were dropped. Significance denoted by *** if $p < 0.001$.

Appendix B.2: Latent factor analysis of depression at t⁺

	coefficient	sig	
Item 1	3.27	***	Depression
Item 2	3.69	***	
Item 3	4.74	***	
Item 4	3.23	***	
Item 5	3.51	***	
Item 6	3.71	***	

*Significance denoted by *** if $p < 0.001$.

Appendix B.3: Latent factor analysis of depression at t⁺

	coefficient	sig	
Item 1	3.98	***	Depression
Item 2	3.74	***	
Item 3	4.98	***	
Item 4	7.61	***	
Item 5	3.89	***	
Item 6	3.46	***	

⁺ Missing data were dropped. Significance denoted by *** if $p < 0.001$.