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Hope, social relations, and depressive symptoms in mothers of children with autism spectrum disorder

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ABSTRACT

Background: Raising a child with autism spectrum disorder (ASD) may negatively impact maternal mental health outcomes. Feelings of loneliness and a lack of social support may contribute to these outcomes. One factor that may help to promote better outcomes is hope. The current study examined the associations between maternal hope, loneliness, social support, and depressive symptoms.

Method: Ninety-four mothers of a child with ASD participated in this online study. Mothers were predominantly Caucasian, middle class, and educated. Children ranged in age from 2 to 13 years. Mothers completed questionnaires assessing hope, loneliness, perceived social support from friends and family, and depressive symptoms.

Results: The results of a multiple mediator model indicated that hope agency was indirectly associated with depressive symptoms via loneliness. In a follow-up serial mediation model, hope agency was associated with depressive symptoms through family support and loneliness.

Conclusions: The present study contributes to the growing body of research focusing on positive personality characteristics and mental health outcomes in mothers of children with ASD. Given that increased hopeful thinking was associated with less loneliness, the construct of hope should be given more attention in interventions that are aimed at improving maternal outcomes. Increasing hopeful thinking may be particularly important in aiding with improvement during psychotherapy for mothers with clinical levels of depressive symptoms.

1. Introduction

Mothers raising children with autism spectrum disorder (ASD) face numerous challenges that may negatively impact their quality of life and mental health outcomes (e.g., Altiere & Von Kluge, 2009a; Davis & Carter, 2008; Kuhlthau et al., 2014). Studies have consistently demonstrated that mothers of children with ASD report elevated levels of stress and depressive symptoms compared to parents of typically developing children (e.g., Ingersoll & Hambrick, 2011; Lai, Goh, Oei, & Sung, 2015). Children's behavior problems are salient predictors of maternal outcomes (e.g., Davis & Carver, 2008; Falk, Norris, & Quinn, 2014); however, feelings of social isolation (Dunn, Burbine, Bowers, & Tantleff-Dunn, 2001) may also contribute to maternal mental health outcomes. Following the increasing popularity of positive psychology, research has begun to focus on identifying factors that promote positive adaptation in mothers of children with ASD (e.g., Ekas, Timmons, Pruitt, Ghilain,

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& Alessandri, 2015; Faso, Neal-Beevers, & Carlson, 2013; Lloyd & Hastings, 2009a, 2009b). The current study contributes to this growing body of research by examining the associations between hope, social support, loneliness, and depressive symptoms in mothers of children with ASD.

One of the dominant themes that has emerged from over two decades of research with mothers of children with ASD is the increased amount of stress, depression, and anxiety that mothers experience (e.g., Bitsika, Sharpley, & Bell, 2013; Falk et al., 2014; Lai et al., 2015). One factor that may contribute to these negative outcomes are feelings of social isolation that parents often report. In one qualitative study, parents discussed issues surrounding a lack of time available to spend with friends and family (Altiere & Von Kluge, 2009a). Another qualitative study found that parents reported several themes surrounding feelings of social isolation, including feeling unable to be in public due to their child's behavior, losing friends, and being treated badly by strangers (Myers, Mackintosh, & Goin-Kochel, 2009). These feelings of social isolation may persist throughout the child's lifespan as parents of adults with high-functioning ASD also reported feeling that family members and friends did not understand the disorder and, therefore, did not provide support (Griffith, Totsika, Nash, Jones, & Hastings, 2012). Loneliness refers to feelings and thoughts of isolation and being disconnected from others (Russell, Peplau, & Cutrona, 1980) and is a cognitive appraisal of social relationships (Holmén & Furukawa, 2002). Individuals who report loneliness may have a large social network, but they are not satisfied with the interactions they have with those around them (Rokach, 2011). In the general population, greater loneliness was associated with poor psychological well-being, including increased depressive symptoms (Cacioppo, Hawkley, & Thisted, 2010) and increased hopelessness (Chang, Muyan, & Hirsch, 2015). To date, however, there have been no quantitative studies examining associations between loneliness and depressive symptoms in mothers of children with ASD.

The negative outcomes associated with raising a child with ASD have been well documented; however, there is considerable individual variability in outcomes and some mothers adapt to the challenges in a positive manner (e.g., Hastings & Taunt, 2002). Therefore, in recent years, studies have begun to focus on factors that promote better psychological well-being among mothers of children with ASD (i.e., lower negative outcomes and/or increased positive outcomes). This emphasis aligns well with the growing field of positive psychology, which focuses on positive outcomes and factors that promote positive adaptation (Seligman & Csikszentmihalyi, 2000). Research in positive psychology focuses on three domains: (1) the pleasant life; (2) the engaged life; and (3) the meaningful life (Duckworth, Steen, & Seligman, 2005). The pleasant life domain focuses on positive emotions, including feelings of happiness, satisfaction, and contentment. The engaged life refers to strengths of character that promote positive functioning (e.g., kindness, humor, fairness, hope, gratitude). Finally, the meaningful life involves belonging to or serving positive institutions (e.g., families, friendships, larger community). The current study focused on two domains, the engaged and meaningful lives, and their associations with maternal psychological well-being.

Hope has received increasing attention as a variable that may promote psychological well-being. Hope has traditionally been considered a strength of character that is part of the engaged life (Peterson & Park, 2009). In his theory of hope, Snyder (2002) argues that human behavior is goal-directed and that goals are fundamental to hopeful thinking. Hopeful thinking consists of an individual's perceived ability to generate ways of reaching goals (pathways) as well as their perceived ability to use these pathways to reach their goals (agency). Thus, agency is the motivational component of hope and reflects an individual's intention to act upon the pathways generated (Rand & Cheavens, 2009; Snyder, Feldman, Taylor, Schroeder, & Adams, 2000). Individuals who engage in elevated levels of both agentic and pathways thinking are typically referred to as *high-hope* people (Snyder et al., 2000). Hope is generally measured and conceptualized as a dispositional characteristic and measured using trait measures (e.g., Snyder et al., 1991); however, hope can also fluctuate in response to different situations (Snyder et al., 1996). It is important to note that while optimism and hope are both in the realm of positive psychology and appear to be similar constructs, they are only modestly related (Snyder et al., 1991). Optimism reflects an individual's general expectancies in life (Scheier & Carver, 1985) whereas hope refers to goal-directed thoughts and actions.

Since the development of the theory, hope has been consistently linked to a variety of favorable outcomes in the general population, including less depressive symptoms (Chang et al., 2013). Among parents of typically developing children, hope is associated with increased life satisfaction (Hoy, Suldo, & Mendez, 2013). Similar findings have been reported for parents of children with psychological and physical health problems. For example, Kashdan et al. (2002) examined hope in mothers of children with externalizing disorders and found that hope was associated with adaptive coping and better family functioning. In another study of parents of children receiving cancer treatment, Hullmann, Fedele, Molzon, Mayes, & Mullins (2014) reported that parents with higher levels of hope also reported more positive outcomes as a result of their child's cancer diagnosis. There are, however, limited studies examining dispositional hope among mothers of children with ASD. Lloyd and Hastings (2009a, 2009b) examined the relationship between dispositional hope and depressive symptoms in mothers of children with intellectual disabilities, including ASD. Results of that study indicated that hope agency and hope pathways were associated with decreased depressive symptoms. In a sample of mothers of children with ASD and mothers of children with Down syndrome, Ogston, Mackintosh, & Myers (2011) found that higher levels of hope were associated with less worry. However, mothers of children with ASD reported lower hope than mothers of children with Down syndrome. In another study of mothers of children with ASD, Faso et al. (2013) found that hope agency was associated with less depressive symptoms; however, in contrast to previous research (Lloyd & Hastings, 2009a, 2009b), hope pathways was not a significant predictor of depressive symptoms. Although both studies examined the direct relationship between hope and depressive symptoms, there is no research examining potential mechanisms that might explain this relationship.

One factor that has emerged as particularly important for the psychological well-being of mothers of children with ASD is social support. In the current study, perceived social support refers to the extent to which a person feels they have received instrumental (e.g., tangible help) or emotional (e.g., advice) support from another person. In addition to reporting that they find support from friends and family to be important (Altiere & von Kluge, 2009b), mothers' feelings of being supported was associated with decreased depressive symptoms (Benson, 2012). Hopeful thinking may engender increased social support through its association with interpersonal relationships. Hopeful thinking is believed to develop during early childhood via sensitive and supportive interactions with caregivers (Snyder, Cheavens, & Sympson, 1997; Shorey, Snyder, Yang, & Lewin, 2003) and is also thought to promote social relationships. For example, high-hope adults are more likely to report increased social support (Barnum, Snyder, Rapoff, Mani, & Thompson, 1998) and increased social competence (Snyder et al., 1997). In addition, high-hope individuals are more likely to be friends with other high-hope individuals (Parker et al., 2015). Unfortunately, the research in this area has not established if hopeful thinking leads to better social relationships or if improved social relationships promote hopeful thinking. However, Snyder et al. (1997) argued that high-hope individuals are more likely to form quality social relationships because they are interested in pursuing their own goals and are also interested in the goals of those around them. Therefore, it may be possible that hopeful thinking is responsible for promoting social relationships.

If hopeful thinking engenders quality social relationships, it may also serve to indirectly ameliorate the feelings of loneliness and social isolation that parents of children with ASD report (e.g., Myers et al., 2009). As previously discussed, loneliness refers to emotional distress that an individual experiences as a result of thinking that their social relationships are low quality (Peplau & Perlman, 1982). A large body of research in the general population has found that social support is typically associated with lower levels of loneliness (e.g., Cacioppo et al., 2010; Shiovitz-Ezra & Leitsch, 2010). Chen and Feeley (2014), in a study of older adults, found that increased social support was associated with decreased loneliness which, in turn, predicted better well-being. Thus, feeling that friends, family, or partners are supportive (i.e., perceived social support) is directly associated with a reduction in feelings of distress related to social relationships (i.e., loneliness).

The purpose of the current study was to extend previous research that found associations between hope and maternal outcomes (e.g., Faso et al., 2013) by examining the mechanisms responsible these associations. To accomplish these goals a mediation analysis was conducted wherein hope agency and hope pathways were specified as simultaneous predictors of depressive symptoms via social support and loneliness. First, consistent with previous research with mothers of children with ASD we expected that increased hopeful thinking would be associated with less depressive symptoms. Next, based on research conducted in the general population, we hypothesized that higher levels of hope would be associated with increased perceived social support and less loneliness. In turn, increased social support was hypothesized to be associated with less depressive symptoms, whereas loneliness was predicted to be associated with greater depressive symptoms. Finally, we tested a series of serial mediation models where hopeful thinking was predicted to be positively association with perceived social support which, in turn, predicted decreased loneliness and, subsequently, less depressive symptoms.

2. Method

2.1. Participants

The current sample was from a larger study of parents of children with ASD ($n = 136$). In order to qualify for the current study, participants had to be female ($n = 99$) and have no missing data on any of the study variables ($n = 94$). Although data was collected from fathers, because of the small sample size ($n = 37$), dependent nature of the data (mothers and fathers were married to one another), and the complexity of the analyses we did not include fathers in this study. The final sample of 94 mothers were between 25 and 55 years old ($M = 38.87$, $SD = 6.19$) and had a child with an ASD diagnosis who was between the ages of 2 and 13 ($M = 7.73$, $SD = 2.58$). The children were predominantly male (85.1%). The majority of mothers were married (84.0%), but 7.4% were divorced, 4.3% were single, 3.2% were separated, and 1.1% were widowed. While 87.2% of mothers identified as Caucasian, 9.6% identified as Hispanic and/or Latin American, 2.1% as African American, 1.1% as Asian or Pacific Islander, and 1.1% as other. The sample was predominantly middle class with 47.8% of mothers reporting a household income of $40,000 to $99,999, but 24.5% reported an income level below and 27.7% reported above this level. Finally, the majority of mothers had received at least a college degree (71.3%).

2.2. Procedure

Participants were recruited through online resources (e.g., Facebook, ASD-specific blogs) throughout the United States. In addition, details of the study were shared on social media and via word of mouth. Mothers who expressed interest in the study were provided with further information about the study. After agreeing to participate, they received a link to complete all of the questionnaires online. Online, they first read and electronically signed the informed consent and then completed questionnaires pertaining to demographics as well as personal characteristics and mental health. Upon completion of the online assessment, mothers were mailed a $10 gift card to a national retailer. The institutional research ethics board at the authors' university approved this study.

2.3. Measures

2.3.1. Maternal hope

Mothers completed the Trait Hope Scale, which is a valid and reliable measure of individual hope (Snyder et al., 1991). The scale is 12 items and contains two subscales: hope agency and hope pathways. Each scale is four items, and there are four filler items to which mothers responded on an 8-point scale (1 = definitely false to 8 = definitely true). Each scale was calculated by summing together the four items, and higher scores reflected higher levels of hope. The hope agency subscale consists of items such as "I energetically pursue my goals" and "I meet the goals that I set for myself" to measure the degree of goal-directedness. The hope pathways subscale consists of items such as "I can think of many ways to get out of a jam" and "I can think of many ways to get the things in life that are important to me" that measure the ability to plan ways of meeting goals. The internal consistencies for the present sample for hope agency and pathways were 0.82 and 0.80 respectively.

2.3.2. Maternal loneliness

Mothers also completed the Revised UCLA Loneliness Scale, a reliable and valid measure of a person's subjective feelings of both loneliness and social isolation (Russell et al., 1980). The scale consists of 20 items that mothers rated on a 4-point scale (1 = never to 4 = often). Sample items include "I lack companionship," "I feel left out," and "there is no one I can turn to." After reverse coding nine items, all of the items were summed to create a total score where higher scores reflected higher levels of subjective loneliness. Internal consistency for the present sample was 0.93.

2.3.3. Maternal social support

Maternal social support was measured using the Perceived Social Support – Friend Scale and Family Scale, which is a valid and reliable measure of perceived sources of support (Procidano & Heller, 1983). Each scale contains 20 items to which mothers responded if they believed certain feelings or experiences occurred in their relationships with friends and family on a 3-point scale (yes, no, don't know). For friend support, mothers responded to items such as "I rely on my friends for emotional support," "my friends are good at helping me solve my problems," and "I have a deep sharing relationship with a number of friends." For family support, mothers responded to items such as "my family gives me the moral support I need," "I rely on my family for emotional support," and "my family enjoy hearing about what I think." Scores were calculated for each scale by counting the number of items to which mothers responded yes, where higher scores reflected more support from friends or family. The internal consistency for this sample was 0.65 for friend support and 0.72 for family support.

2.3.4. Maternal mental health

Maternal mental health was measured using the Center for Epidemiologic Studies Depression Scale (CES-D), which is a valid and reliable measure of depressive symptoms (Radloff, 1977). Mothers responded on a 4-point Likert-type scale (0 = rarely or none of the time; less than 1 day to 3 = most of the time; 5–7 days) to 20 items that asked how often they had experienced different symptoms in the past week. Example items include "I felt depressed," "I had crying spells," and "I felt sad." Four items were reverse coded, and sum scores were calculated where higher scores indicated more depressive symptoms. A score of 16 or higher is considered indicative of potential clinical depression (Radloff, 1977). The internal consistency for the present sample was 0.90.

3. Results

Descriptive statistics are presented in Table 1 and correlations between study variables are shown in Table 2. Although the hope agency and pathways subscales as well as depressive symptoms and loneliness were significantly correlated, there was no evidence of multicollinearity between the variables. Hope agency was associated with decreased depressive symptoms, decreased loneliness, and increased friend and family support. Conversely, hope pathways was only associated with decreased loneliness. Only family support was associated with decreased depressive symptoms, whereas both friend and family support were associated with decreased loneliness. Next, we examined whether any demographic variables (e.g., child age, parent age, marital status, parent education, parent ethnicity, child gender, or presence of additional children with ASD) were related to the study variables to determine whether they needed to be included as covariates in subsequent

Table 1
Descriptive statistics.

Variable	Range	*Mean* (*SD*)
Hope Agency	4.00–32.00	25.16 (4.93)
Hope Pathways	9.00–32.00	25.86 (4.06)
Loneliness	22.00–70.00	42.81 (11.93)
Friend Support	3.00–17.00	11.04 (2.84)
Family Support	0.00–18.00	11.65 (3.96)
Depressive Symptoms	1.00–52.00	18.09 (10.54)

Table 2
Correlations between study variables.

	1	2	3	4	5	6
1. Hope Agency	–	0.50***	−0.47***	0.21*	0.33**	−0.39***
2. Hope Pathways		–	−0.20*	0.08	0.12	−0.10
3. Loneliness			–	−0.43***	−0.40***	0.54***
4. Friend Support				–	0.18	−0.12
5. Family Support					–	−0.31**
6. Depressive Symptoms						–

* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

models. Marital status was significantly associated with hope agency, $F(4, 93) = 3.68$, $p < 0.01$, $\eta^2 = 0.14$, and hope pathways, $F(4, 93) = 6.76$, $p < 0.001$, $\eta^2 = 0.23$. Mothers who were single or widowed reported lower levels of hope agency whereas mothers who were married or widowed reported lower levels of hope pathway. Parent education was significantly associated with hope agency, $F(4, 93) = 3.05$, $p < 0.05$, $\eta^2 = 0.12$. The lowest levels of hope agency were reported among mothers who had attended some college classes or received vocational education. Therefore, all subsequent analyses included marital status and parent education as covariates.

3.1. Mediation models

In order to examine the research questions of interest a series of mediation models were tested. The first hypothesized model was specified as a multiple mediation using the MEDIATE macro in SPSS (Hayes & Preacher, 2014). As shown in Fig. 1a, hope agency and pathways were hypothesized predictors of depressive symptoms. Loneliness, friend support, and family support were specified as mediators of the relationship between hope and depressive symptoms. Marital status and parent education were included as covariates. All paths were simultaneously estimated and 90% Monte Carlo confidence intervals were estimated using 10,000 resamples. As shown in Fig. 1b (also see Table 3 for full model results), consistent with the stated hypotheses, there was a significant, indirect relationship between hope agency and depressive symptoms via loneliness (indirect effect = −0.52, $SE = 0.17$, 90% CI [−0.82, −0.27]). Hope agency was associated with decreased loneliness,

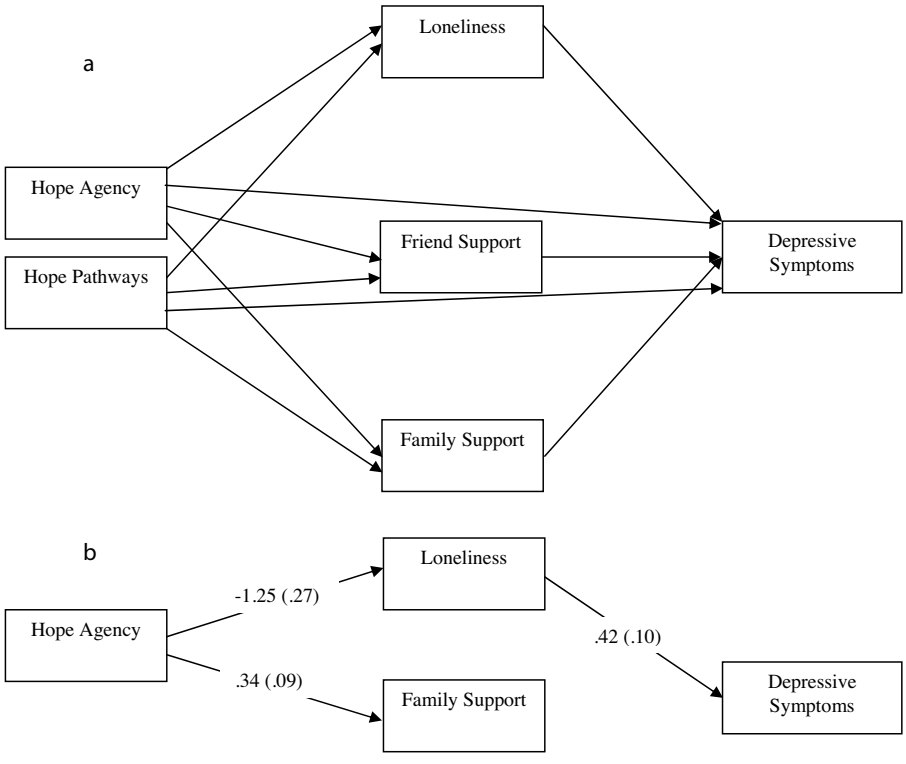

Fig. 1. (a) Hypothesized multiple mediator model. (b) Multiple mediator model with significant estimates and standard errors.

Table 3
Results of multiple mediator model.

Independent Variables	Mediators						Dependent Variable	
	Loneliness		Friend Support		Family Support		Depressive Symptoms	
	Coeff.	SE	Coeff.	SE	Coeff.	SE	Coeff.	SE
Hope Agency	−1.25***	0.27	0.11	0.07	0.34***	0.09	−0.48	0.26
Hope Pathways	0.16	0.31	−0.01	0.08	−0.09	0.11	0.29	0.26
Mediators								
Loneliness	–	–	–	–	–	–	0.42***	0.10
Friend Support	–	–	–	–	–	–	0.52	0.36
Family Support	–	–	–	–	–	–	−0.24	0.26

Note: ***$p < 0.001$.

$b = -1.25$, $SE = 0.27$, $p < 0.001$. Loneliness, in turn, was associated with increased depressive symptoms, $b = 0.42$, $SE = 0.10$, $p < 0.001$. The direct effect of hope agency on depressive symptoms was non-significant, $b = -0.48$, $SE = 0.26$, $p = 0.07$. Contrary to hypotheses, friend and family support were not significant mediators in this model. This specified model accounted for 17.71% of the total variance of depressive symptoms.

Next, we tested serial mediation models using the PROCESS macro in SPSS (Hayes, 2013), specifying 95% bias-corrected bootstrapped confidence intervals using 10,000 resamples. In serial mediation, an independent variable (X) is hypothesized to predict a series of mediators (M1, M2) and the dependent variable (DV). M1 is hypothesized to predict M2 and a DV. Finally, M2 is hypothesized to predict a DV. Serial mediation is shown when the relationships between X and M1, M1 and M2, and M2 and a DV are significant. Currently, it is not possible to simultaneously test multiple IVs in the same model. Therefore, we specified four separate serial mediation models wherein hope (IV; Models 1 & 2: hope agency; Models 3 & 4: hope pathways) was specified as a predictor of depressive symptoms (DV; Models 1–4). Social support (M1; Models 1 & 3: friend support; Models 2 & 4: family support) and loneliness (M2; Models 1–4) were specified as mediators. The hypothesized model is shown in Fig. 2a. Parent education and marital status were entered as covariates in each model.

The results of all models are presented in Table 4. Only model two exhibited evidence of serial mediation. The indirect effect of hope agency on depressive symptoms via family support and loneliness was significant (indirect effect = −0.07, $SE = 0.04$, 95% CI [−0.21, −0.03]). Hope agency was associated with increased family support, $b = 0.30$, $SE = 0.08$, $p < 0.001$. Family support, in turn, was associated with decreased loneliness, $b = -0.85$, $SE = 0.29$, $p < 0.01$. Next, loneliness was associated with increased depressive symptoms, $b = 0.37$, $SE = 0.09$, $p < 0.001$. The direct association between hope agency and depressive symptoms was non-significant, $b = -0.35$, $SE = 0.23$, $p > 0.05$. In the remaining models, one or more of the relationships were non-significant (see Table 4).

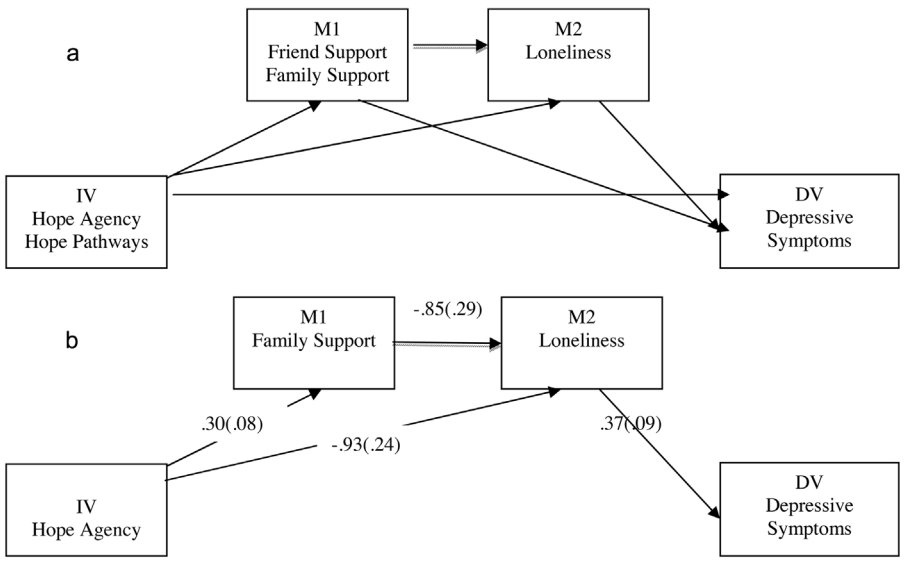

Fig. 2. (a) Hypothesized serial mediation model. Four separate models were tested. Hope agency was entered in models 1 and 3, hope pathways was entered in models 2 and 4, loneliness and depressive symptoms were entered in all models. (b) Significant serial mediation model with significant estimates and standard errors.

Table 4
Results of serial mediation models.

Predictor → Outcome	Coefficient	SE
Model 1		
Hope Agency → Friend Support	0.10	0.06
Friend Support → Loneliness	−1.49***	0.37
Loneliness → Depressive Symptoms	0.45***	0.10
Hope Agency → Depressive Symptoms	−0.39	0.22
Model 2		
Hope Agency → Family Support	0.30***	0.08
Family Support → Loneliness	−0.85**	0.29
Loneliness → Depressive Symptoms	0.37***	0.09
Hope Agency → Depressive Symptoms	−0.35	0.23
Model 3		
Hope Pathways → Friend Support	0.05	0.07
Friend Support → Loneliness	−1.75***	0.40
Loneliness → Depressive Symptoms	0.53***	0.09
Hope Pathways → Depressive Symptoms	0.04	0.24
Model 4		
Hope Pathways → Family Support	0.11	0.10
Family Support → Loneliness	−1.20***	0.29
Loneliness → Depressive Symptoms	0.43***	0.09
Hope Pathways → Depressive Symptoms	0.05	0.24

Note: $^{**}p < 0.01$; $^{***}p < 0.001$.

4. Discussion

The purpose of the current study was to examine the associations between hope (hope agency and hope pathways), social relationships (social support and loneliness), and depressive symptoms in mothers of children with ASD. The construct of hope has received little empirical attention in this population and this study was the first to examine potential mechanisms to explain the association between hope and depressive symptoms found in a previous study (Faso et al., 2013). We found that hopeful thinking, namely hope agency, was indirectly associated with depressive symptoms via maternal loneliness. Mothers who reported greater hope agency also reported less loneliness and lower depressive symptoms. In a separate mediation model, we also found that hope agency was associated with increased family support which, in turn, was associated with less loneliness and lower depressive symptoms.

Consistent with the study hypotheses, hopeful thinking was simultaneously associated with decreased loneliness and increased family support. These findings support previous cross-sectional studies that high-hope individuals report less loneliness (Muyan et al., 2015) and increased social support (Barnum et al., 1998). Higher hope individuals also tend to report positive relationships (Snyder et al., 1997). Snyder (2002) argues that during stressful situations, individuals with high levels of hope will turn to friends and family for support. Although our model was designed to test this contention (i.e., hope predicts social outcomes), our study was not longitudinal. To our knowledge, there have been no longitudinal studies, in this population or others, testing the direction of effects between hope and loneliness or social support.

In this study, hope was associated with increased family support as compared to friend support. Mothers of children with ASD may find more benefits in turning to family for support as compared to friends. For example, Ekas, Lickenbrock, and Whitman (2010) found that family support was associated with increased optimism, positive affect, life satisfaction, and psychological well-being whereas friend support was associated with only increased positive affect. High-hope mothers may turn to other family members who share similar goals pertaining to their child's treatment and care or they may feel that family members are more understanding and sympathetic to the problems they face. Recent research has found that the quality of the relationship with extended family members (e.g., grandparents) may be particularly important for parent well-being (Derguy, Bailara, Michel, Roux, & Bouvard, in press).

In a follow-up model, hopeful thinking was associated with increased family support which, in turn, was associated with decreased loneliness. Previous studies in the general population have found significant associations between social support and loneliness (e.g., Ben-Zur, 2012; Utz, Swenson, Caserta, Lund, & deVries, 2014). A longitudinal study of older adults found that social support predicted later feelings of loneliness (Ellwardt, Aartsen, Deeg, & Steverink, 2013). Our findings are consistent with these studies and extend the associations to mothers who may be experiencing chronic stressors associated with raising a child with a lifelong developmental disability (White, McMorris, Weiss, & Lunsky, 2012). Although social support and loneliness were moderately related in the current study, the two variables are separate constructs. Loneliness refers to the cognitive appraisals of social relationships (Holmén & Furukawa, 2002) as opposed to the actual amount of social resources available. For example, two individuals can have similar social networks (e.g., size of social network), but have different perceptions of satisfaction with the quality of interactions with members of their network (e.g., Rokach, 2011).

In the current study, the measure of social support asked mothers to answer yes or no to a series of questions about their perceptions of the availability of social support and not about their feelings of being satisfied with that support. White and Hastings (2004) reported that the helpfulness of social support sources as compared to number of support sources was a better predictor of well-being among parents of children with intellectual disabilities, including ASD. Future research is needed to examine the associations between different aspects of social support (number of supports vs. satisfaction with supports) and loneliness in mothers of children with ASD.

Although hope agency was associated with both loneliness and family support, only maternal feelings of loneliness mediated the association between hope and depressive symptoms. Although loneliness and depression may appear to be similar constructs, there is research in the general population suggesting they are different. For example, a seminal study by Weeks, Michela, Peplau, and Bragg (1980) utilized structural equation modeling to show that although loneliness and depression were correlated, they were distinct constructs. There is also empirical support for the hypothesis that feelings of loneliness precede the onset of depression. In a longitudinal study of college students, Wei, Russell, and Zakalik (2005) found that loneliness was a significant predictor of subsequent depression, after controlling for initial levels of depression. The negative effects of loneliness persist throughout the lifespan. Across a five-year period, Cacioppo et al. (2010) found that loneliness predicted subsequent changes in depressive symptoms, but not vice versa, among older adults. A two-year longitudinal study of older adults in the Netherlands reported similar findings (Holvast et al., 2015). Further evidence for considering loneliness and depression as separate, though related, constructs comes from factor analyses showing they are distinct factors (Cacioppo et al., 2006) and that other dispositional factors (e.g., neuroticism) do not account for associations between loneliness and depressive symptoms (Cacioppo et al., 2006). The current study is the first known study to examine these associations in mothers of children with ASD and longitudinal studies are needed to disentangle the direction of effects in this population. Although family support and depressive symptoms were modestly correlated in initial analyses, after including friend support and loneliness in the multiple mediation model, the association was non-significant. This was surprising given that previous research with mothers of children with ASD has found social support to be an important predictor of well-being (e.g., Benson, 2012). It is possible that this is due to the strength of the association between loneliness and depressive symptoms and the sample size of the current study. Increasing the sample size may result in increased power to detect the relationship between family support and depressive symptoms in the larger multiple mediation model.

In the current study hope agency, as compared to hope pathways, was significantly associated with maternal outcomes. This finding is consistent with previous studies of parents of children with ASD (Faso et al., 2013; Lloyd & Hastings, 2009a, 2009b). In hope theory, pathways refers to the ability to generate ways of reaching goals whereas agency refers to an individual's perceptions of whether they can use those imagined pathways (Snyder, 2002). Agency is believed to be the motivational component of hope theory (Snyder, 2002) and consists of thoughts such as "I can meet my goals." Agency thinking is important when an individual's goals are blocked because it provides the encouragement necessary to generate and follow alternate pathways (Snyder, 2002). In the context of raising a child with ASD, Lloyd and Hastings (2009a, 2009b) argued that since parents face numerous stressors and barriers, agency thinking may be especially important for better well-being. Parents often have goals pertaining to their child's education, involvement in interventions, and medical care but encounter barriers as reflected in reports of dissatisfaction in these domains (e.g., Carbone, Behl, Azor, & Murphy, 2010; Tucker & Schwartz, 2013). For example, in the context of a medical setting, parents of children with ASD reported that health care providers may not understand the impact of ASD, the office visits were too fast paced, and the medical environment may be overwhelming to their child (e.g., waiting too long, bright lights, too much noise; Bultas, McMillin, & Zand, 2016). In this population, it would be particularly interesting to examine the importance of agency thinking in parents of various ethnic/racial minority groups (e.g., Latino parents) as they commonly encounter additional barriers (Zuckerman, Sinche, Mejia, Cobian, Becker, & Nicolaidis, 2014). Although research is limited, studies find that ethnic/racial minority families are less likely to attend follow-up evaluations after their child initially screens positive for ASD, possibly due to economic challenges (Khowaka, Hazzard, & Robins, 2015). In addition, certain racial/ethnic groups (e.g., Hispanic Americans, black Americans, and Alaskan Native/Native Americans) score at basic or below basic levels of health literacy (Kutner, Greenberg, Jin, & Paulsen, 2006). However, if the results of scientific studies are translated into English and Spanish-language *ASD Science Briefs*, low income Hispanic parents were more likely to remember the information and share it with other people (Lajonchere et al., 2016). The barriers that exist for parents, including ethnic/racial minorities, may negatively impact their motivation to meet their goals. For example, a parent may seek out medical care for their child's ASD, but at the initial visit they feel that the doctor does not understand the disorder and they lose motivation for following through with their initial plans.

5. Limitations and conclusion

Although this study complemented and expanded upon existing research on hopeful thinking in mothers of children with ASD, there are several limitations that warrant discussion. First, this study relied on maternal self-report of all measures, including children's ASD diagnosis, at a single time point. Relying on a single method and a single reporter may lead to biased results. In addition, we were unable to independently confirm children's diagnosis. Future studies should verify children's diagnoses using gold standard assessments in a laboratory setting. In addition, semi-structured clinical interviews should be used to assess maternal mental health outcomes. The mediation models tested in this study should be replicated with longitudinal data. Maxwell and Cole (2007) recommend measuring study variables at three separate points in time in order to conclude that mediation has occurred. In a longitudinal context, researchers could test a competing hypothesis wherein

hopeful thinking serves as a mediator of the relationship between social support, loneliness and depressive symptoms. A longitudinal study would also allow for the examination of change over time in mothers' hopeful thinking, social support, loneliness, and depressive symptoms. This would be a contribution to our understanding of maternal well-being, as very few studies have examined well-being longitudinally (e.g., Barker et al., 2011; Gray, 2002).

A second set of limitations involves the characteristics of the sample. The majority of the mothers identified as Caucasian, highly educated, middle class, and married. These demographics do not represent the larger population of mothers of children with ASD. In order to increase the generalizability of the study results, future research should seek to include mothers from different socioeconomic backgrounds, including ethnic/racial minorities. It is possible that the processes may differ in mothers from different backgrounds. In the general population, hope agency was found to be higher in Latinos compared to European Americans and hope pathways was higher in African Americans and Latinos compared to European Americans (Chang & Banks, 2007). However, this same study found that the associations between hope and positive outcomes (e.g., life satisfaction) were similar across ethnic/racial groups (Chang & Banks, 2007). This study also restricted participants to mothers of children with ASD and did not include the perspectives of fathers. Fathers may be differentially impacted by the challenges associated with raising a child with ASD (e.g., Rivard, Terroux, Parent-Boursier, & Mercier, 2014) and the associations we found in this study may differ by parent gender. Although levels of hope are similar for mothers and fathers (Faso et al., 2013), the associations between a parent's hopeful thinking and their individual outcomes were different (Faso et al., 2013; Lloyd & Hastings, 2009a, 2009b). Given these findings, it would be interesting for future studies to incorporate dyadic analyses to examine how each parent's hopeful thinking impacts their own mental health outcomes as well as their partner's outcomes.

The findings of this study highlight the importance of feelings of social isolation and loneliness that mothers of children with ASD commonly report (e.g., Altiere & von Kluge, 2009a). Given that increased hopeful thinking was associated with less loneliness, the construct of hope should be given more attention in interventions that are aimed at improving maternal well-being. One study has shown that a simple exercise, designed to generate hopeful thinking, where individuals write about a time when a negative event led to unexpected positive outcomes (i.e., one door closes, another door opens exercise) can increase levels of happiness (Gander, Proyer, Ruch, & Wyss, 2013). Increasing hopeful thinking may be particularly important in aiding with improvement during psychotherapy for mothers with clinical levels of depressive symptoms. In a previous study, higher levels of hope agency were associated with improvements during early stages of therapy whereas hope pathways was associated with improvements during the latter stages of therapy (Irving et al., 2004).

The findings of this study expand on previous research of hopeful thinking in mothers of children with ASD (Faso et al., 2013; Lloyd & Hastings, 2009a, 2009b) by attempting to delineate the mechanisms responsible for the association between hope and well-being. Researchers have long known the importance of interpersonal relationships and this study provides further evidence that perceived support from family members may be particularly important for mothers of children with ASD. Moreover, this study was the first to quantitatively examine the construct of loneliness in this population and the results suggest that dispositional characteristics of the mother may be important to consider when examining predictors of loneliness. In the realm of positive psychology, extensive research has been conducted examining the engaged life, consisting of strengths of character (e.g., hope; Peterson & Seligman, 2004). However, these character strengths, as they are traditionally defined within positive psychology, have been given little attention in studies of parents of children with ASD. Therefore, the present study provides a foundation for future research and a call to researchers to consider such constructs in future studies.

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