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6  A Dyadic Mediation Study on Social Support, Coping, and Stress among Couples Starting Fertility

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32

33    **Abstract**

34    This study adopted a dyadic approach to explore the associations between social support and stress

35    as mediated by coping among infertile couples. All these variables were infertility-specific. A total

36    of 201 couples starting their first assisted reproductive technology (ART) treatment completed self-

37    reports of infertility-specific support from spouse and from social network, infertility-related coping

38    with four strategies (active-avoidance, active-confronting, passive-avoidance, and meaning-based),

39    and infertility stress. The actor-partner interdependence model was applied. Results indicated that

40    dyadic associations between support and stress were either direct or mediated by individual or

41    partner coping, with differences based on gender, source of support, and coping strategy. For both

42    genders, greater support from spouse was associated with lower individual and partner stress

43    directly and indirectly, through lower partner's use of active-avoidance coping. In men, the

44    relationship between support from spouse and stress was also mediated by individual/partner

45    avoidance coping strategies. As for support from social network, greater levels were directly

46    associated with a lower partner stress in women and with higher individual stress in men. For both

47    genders, the relationship between support from social network and stress was also mediated by

48    active-confronting coping, which was associated with higher individual and partner stress. The

49    findings suggest a potential protective role of support from spouse and an adverse effect of that

50    from people outside the dyad. Interventions for couples starting ART treatment should focus on

51    promoting infertility-related communication and support within the couple, which might help to

52    reduce the use of infertility-specific maladaptive coping strategies.

Experiencing infertility is physically and psychologically demanding in all cultures and societies and is reported by couples as one of the most stressful events in their lives (Greil, Slauson-Blevins, & McQuillan, 2010). Stress is traditionally intended as a relationship between the individuals and their environment that is appraised by them as exceeding their resources and threatening their well-being (Lazarus & Folkman, 1984). Both the loss of plans to have children and fertility treatment are important sources of stress, and infertile individuals show higher levels of stress than the fertile population (Rooney & Domar, 2016). The concept of infertility stress refers to the burden that the inability to conceive places on personal, marital, and social life domains for both members of the infertile couple (Schmidt, Holstein, Christensen, & Boivin, 2005). It has been proposed as distinct from and nonoverlapping with the construct of general stress (Sexton, Byrd, O'Donohue, & Jacobs, 2010), as supported by a moderate correlation ($r = .46$) recently found with it (Cesta et al., 2018). Infertility stress has adverse effects on the couples' quality of life (Kim, Shin, & Yun, 2018; Slade, O'Neill, Simpson, & Lashen, 2007) and was seen as a barrier to achieving pregnancy in couples undergoing assisted reproductive technology (ART) treatment (Sominsky et al., 2017). Focusing on infertility-related, rather than general, stress is considered critical to better describe the experience of infertile couples and capture variations in their levels of stress and distress (Greil, Shreffler, Schmidt, & McQuillan, 2011).

If infertility is a relevant source of stress, it is important to identify factors that may help couples to deal with it, and clinicians to design interventions to promote adjustment to infertility and its treatment (Gourounti, Anagnostopoulos, & Vaslamatzis, 2010). A range of psychosocial variables have been considered as either risk or protective factors for infertility stress, such as personality characteristics, cognitions, social support, coping skills, and perceived control (for a review see Gourounti et al., 2010). Regarding protective factors, several studies reported that

greater perceived social support from spouse and from social network was associated with lower

infertility stress (Gourounti et al., 2010). In both fertile and infertile individuals, the greater the

support they receive from their spouses, the greater their marital satisfaction (Abbey, Andrews, &

Halman, 1995). Thus, marital satisfaction has been also used as an indicator of support from spouse

that may protect against general and infertility-related stress in the infertile population (Chochovski,

Moss, & Charman, 2013; Gourounti et al. 2010). In the infertility literature, most studies have

addressed general social support (e.g., Gourounti et al., 2010; Martins, Peterson, Almeida, & Costa,

2011; Martins, Peterson, Almeida, Mesquita-Guimarães, & Costa, 2014); however, Martins et al.

(2014) suggested to consider social support specific to infertility problems and treatments, namely

infertility-specific support. A few studies have addressed infertility-specific support (e.g., Sexton &

Byrd, 2015; Vassard, Rikke, Pinborg, Boivin, & Schmidt, 2012; Ying, Wu, & Loke, 2015) and

showed that this type of support from the spouse was linked to lower infertility stress for both

women and men (Sexton & Byrd, 2015; Ying et al., 2015). As for support from the social network,

a quantitative study of women (Sexton & Bird, 2015) showed its association with lower infertility

stress, while a qualitative study of couples (Ying et al., 2015) indicated that for some of them, the

support from parents contributed to reducing their infertility stress, but for some others, it was an

additional stressor as they felt guilty about adding to their parents' burden. In addition, some

couples described the support from friends and colleagues as potentially negative, due, for example,

to useless or unintentionally unfavorable comments. No study, to our knowledge, has addressed the

relationship between general social support and social support specific to infertility, or their

differential impact on infertility stress. However, evidence was provided that infertility-specific

support from the partner (for men) and from the family (for women) was more closely related to the

decision to terminate fertility treatment than was general social support (Vassard et al., 2012).

## A Path from Social Support to Infertility Stress through Coping Strategies

According to the transactional theory of stress (Lazarus & Folkman, 1984), the most critical

elements in the process of adjusting to stressful life events are cognitive appraisals and coping.

Cognitive appraisals refer to a person's perception and interpretation of the stressor in terms of whether it may cause harm and loss or personal growth and development, and what personal and environmental resources are available to cope with it. Coping represents the cognitive and behavioral efforts employed by an individual to manage a stressful situation (problem-focused coping) and/or to regulate the emotions that the situation generates (emotion-focused coping). Problem-focused coping includes strategies such as taking control, information seeking, or generating alternative solutions, while emotion-focused coping includes strategies such as avoidance, minimization, or positive reappraisal. In the infertile population, problem-focused strategies have been linked to better adjustment, while emotion-focused strategies involving avoidance have been consistently associated with worse adjustment (Gourounti et al., 2010; Rockliff et al., 2014). Specific strategies commonly used to cope with infertility as a source of stress include active- and passive-avoidance, active-confronting, and meaning-based coping (Schmidt, Christensen, & Holstein, 2005). Active- and passive avoidance include coping strategies aimed at distancing from the stressor through active or passive behaviors (e.g., avoiding being with pregnant women or children, or hoping for a miracle, respectively). Active-confronting involves problem-focused strategies such as information seeking, as well as emotion-focused strategies such as letting feelings out. Meaning-based coping involves both problem-focused strategies like finding other life goals, and emotion-focused strategies such as positive reappraisal. Across studies considering infertility-related coping, the strategies most commonly used by infertile women and men were meaning-based and passive-avoidance coping, while active-avoidance was the least used strategy (Martins et al., 2011; Peterson, Pirritano, Christensen, & Schmidt, 2008; Schmidt, Christensen, et al., 2005; Schmidt, Holstein, et al., 2005). Some evidence was found that active- and passive-avoidance had an adverse effect on infertility stress, while active-confronting and meaning-based coping had a protective role (Martins et al., 2011; Schmidt, Holstein, et al., 2005).

Gourounti et al. (2010) proposed a theoretical path model from social support to infertility stress, which had its roots in the transactional theory of stress and was both direct and indirect,

either through cognitive appraisals or coping strategies. Indeed, social support is one of the environmental resources that precede and influence the cognitive appraisal of a stressful event and the coping strategies that a person adopts to deal with it (Lazarus & Folkman, 1984). Specifically, receiving social support may encourage the use of problem-focused coping and reduce the use of avoidant emotion-focused coping, which in turn have been associated with higher positive and negative affect, respectively (Ben-Zur, 2002). The path model by Gourounti et al. (2010) was tested, although not explicitly, in a study of women seeking fertility treatment (Martins et al., 2011). A direct relationship was found between perceived general social support and lower infertility stress that was also mediated by active-avoidance, active-confronting, and meaning-based, but not by passive-avoidance coping.

**A Dyadic Approach**

The path model proposed by Gourounti et al. (2010) focuses on an individual's (i.e., women's) reactions to infertility, without considering those of the other partner. As a shared stressor, infertility triggers coping efforts of both partners and affects both individual and couple outcomes (Pasch & Sullivan, 2017; Peterson et al., 2008), thus a dyadic perspective needs to be adopted when investigating infertility stress (Martins et al., 2014). Studies that investigated the predictors of infertility stress at the couple level have shown that perceived general support from spouse or social network and specific coping strategies have different effects on infertile women and men or on their partners' self-evaluations. For example, in couples seeking fertility treatment, support from spouse alleviated individual symptoms of stress for both women and men and reduced the partner's stress (i.e., the partners' evaluation of their own stress) among women, while support from family decreased individual and partner infertility stress for women but not for men (Martins et al., 2014). However, the role of infertility-specific social support has not been explored from a dyadic perspective.

Regarding the impact of each partner's coping on individual and partner infertility stress, for both women and men, active- and passive-avoidance coping were both associated with increased

157   individual infertility stress, and active-avoidance was also related to increased partner infertility

158   stress. Active-confronting was associated with increased individual infertility stress in both genders,

159   and with greater partner infertility stress among women. Finally, at both the individual and partner

160   levels, meaning-based coping was associated with lower infertility stress among women, but with

161   greater infertility stress among men (Peterson et al., 2008). Thus, when considering the couple as

162   the unit of analysis, the role of meaning-based coping differed across gender, while an adverse

163   effect of active-confronting coping emerged for both women and men, which is in contrast with the

164   findings of studies using individuals as the unit of analysis (Martins et al., 2011; Schmidt, Holstein,

165   et al., 2005).

166       In summary, among studies using a dyadic approach, none has investigated the association of

167   infertility-specific support with infertility stress also considering infertility-related coping strategies

168   as potential mediators.

### The Actor-Partner Interdependence Model

170       The actor-partner interdependence model (APIM; Kenny, Cashy, & Cook, 2006) uses the

171   couple as the unit of analysis and simultaneously estimates individual and partner associations.

172   Individual associations refer to those between a person's own independent variable and her or his

173   own outcome. Partner associations refer to those between the partner's independent variable and the

174   other person's outcome and represent the interdependence that exists between the dyad members

175   (Kenny et al., 2006). Besides modeling the interdependent nature of close relationships, the APIM

176   allows also to test if the individual and partner associations are different for the two dyad members

177   (Garcia, Kenny, & Ledermann, 2015). The actor-partner interdependence mediation model

178   (APIMeM; Ledermann, Macho, & Kenny, 2011) is an extension of the APIM that incorporates

179   mediation. The APIMeM examines whether the individual- and partner-level links between the

180   independent and outcome variables are mediated by each partner's mediator variable.

### The Present Study

The current study was designed to extend prior research by examining how self-evaluated infertility-specific social support and infertility stress are associated in couples starting ART treatment, considering the mediating role of self-evaluated infertility-related coping from a dyadic perspective using the APIMeM. Our general hypotheses were that: (1) greater perceived support would be directly associated with lower stress at both the individual and partner levels; (2) individual coping would mediate both the individual- and the partner-level direct associations between social support and stress. Specifically, greater perceived support would be associated with lower stress through a lower use of active- and passive-avoidance coping, and with higher stress through a greater use of active-confronting coping, while the mediating role of meaning-based coping was expected to be gender-specific. However, we could expect that the indirect paths from social support to stress would differ depending on the source of perceived support (i.e., from spouse or social network).

## Method

### Participants and Procedure

Participants were infertile couples starting ART treatment at a private fertility clinic in Santo André, State of São Paulo, Brazil. The inclusion criteria were 18 years or older, reporting infertility as the inability to conceive after at least one year of regular unprotected sexual intercourse, starting a first ART treatment, and having disclosed their infertility status to their social network (i.e., family, friends, and colleagues). Between September 2016 and April 2017 the couples scheduled for their first consultation for ART were approached by the second author in the waiting room, before the consultation, and were briefly explained the scope of the study. Participation was voluntary, and each participant signed an informed consent form, prior to completing the study questionnaire separately from the partner. During questionnaire completion, the researcher remained in the waiting room and was available to answer any questions. The study complied with the Declaration of Helsinki and was approved by the University Research Ethics Committee (CAAE-FMABC: 57365516.0.0000.0082).

208    Of the 491 consecutively approached couples, 256 (52.14%) met all inclusion criteria and were

209    invited to participate in the study, while 235 (47.86%) were deemed ineligible because they did not

210    meet one or more of the inclusion criteria. Fifty-five couples declined participation due to lack of

211    interest in the research; thus, the study sample consisted of 402 participants (78.5% participation

212    rate), 201 women and 201 men, who completed the study questionnaire with an item nonresponse

213    rate of 1.3%. Omitted items were replaced with the respondent's scale mean. Mean age was 36.22

214    years ($SD = 4.33$; range 24-52 years) for women and 38.32 years ($SD = 6.66$; range 23-63 years) for

215    men. All women except one (aged 52) were of reproductive age ($< 45$ years)[1]. Sixty-seven percent

216    of women ($n = 135$) and 53.7% of men ($n = 108$) had tertiary education. Couples were married or

217    living together for approximately eight years ($M = 7.56$, $SD = 4.57$, range 1-30 years).

218    **Measures**

219    Information on infertility history (length of time trying to have a child, other medically assisted

220    reproduction treatments prior to ART, and infertility counseling) was collected using a

221    questionnaire. Type of infertility (i.e., primary or secondary, and if secondary, having had

222    spontaneous abortions or live births from previous spontaneous conceptions or fertility treatments

223    other than ART) and infertility cause were based on medical records. Based on the international

224    glossary of infertility and fertility care (Zegers-Hochschild et al., 2017), primary infertility was

225    defined as a situation in which the couple has never conceived despite at least 12 months of

226    attempting conception. Secondary infertility was defined as a situation in which the couple has had

227    at least one prior conception but is subsequently unable to conceive after at least 12 months of

228    attempting conception. Infertility cause was categorized as female factors, male factors, mixed

229    factors (i.e., both female and male factors present), or unexplained infertility. Infertility counseling

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[1] Sensitivity analyses were run excluding the couple in which the woman was older than 44 years. The patterns and significance of the associations in the simple APIM and in the APIMeMs remained the same as when all 201 couples were included.

was defined as having received individual or couple infertility-related counseling by a mental health professional before the first consultation for ART.

Self-reports measured infertility stress, infertility-specific support, and infertility-related coping strategies. To ensure adaptation to the Brazilian Portuguese language, and after permission from the authors, the scales were translated and back-translated by two independent bilingual psychologists according to standard procedures (van de Vijver & Hambleton, 1996).

**Stress.** The Infertility-Related Stress Scale (Casu & Gremigni, 2016) was used to assess infertility stress. This 12-item self-report measures the impact of infertility in both the intrapersonal and the interpersonal domains of life (e.g., "How much stress the infertility problem placed on your physical well-being" and "How much stress the fertility problem placed on relationships with friends"). For each item, respondents were asked to rate their perceived amount of stress on a 7-point scale (1 = none at all to 7 = a great deal). The global infertility stress score was used in the present study, which showed a Cronbach's alpha of .94 for women and .95 for men.

**Support from spouse and social network.** Six items were used to assess infertility-specific social support from spouse and social network. Two items referred to the partner (i.e., "Do you get support and understanding from your partner in relation to your difficulty in having children?", and "Do you find it difficult to talk to your partner about your difficulty in having children?"), and four items referred to different social roles such as family, family-in-law, friends, and colleagues (i.e., "Do you get support and understanding from some people in relation to your difficulty in having children?"). Respondents were asked to rate each item on a 5-point scale (1 = never to 5 = always). These items were based on a previous work by Vassard et al. (2012), who developed and used them as single predictors of dropout from fertility treatment but did not report reliability. As evidence of validity, they found that low support from spouse and family predicted treatment termination after 1 year. In the present study, the Spearman-Brown reliability coefficient (Eisinga, Te Grotenhuis, & Pelzer, 2013) for the two items of support from spouse was .65 for women and .63 for men. Cronbach's alpha for the support from social network scale was .84 for women and .89 for men.

**Coping.** The Copenhagen Multi-Centre Psychosocial Infertility (COMPI) research program Coping Strategy Scales (Schmidt, Christensen, et al., 2005) were used to assess the strategies specifically adopted to cope with infertility. This 19-item tool has four subscales: active-avoidance (4 items; e.g., "I leave, when people are talking about pregnancies and children"), active-confronting (7 items; e.g., "I read or watch television about childlessness"), passive-avoidance (3 items; e.g., "I have fantasies and wishes about how things might turn"), and meaning-based (5 items; e.g., "I have grown as a person in a good way") coping. Items were rated on a 4-point scale (1 = not used to 4 = used a great deal). The COMPI coping model was supported by confirmatory factor analyses and significant associations with infertility stress (Martins et al., 2011; Peterson et al., 2008, 2009; Schmidt, Holstein, et al., 2005). In this study, Cronbach's alpha for active-avoidance was .72 for women and .73 for men, for active-confronting was .75 for women and .81 for men, for passive-avoidance was .62 for women and .65 for men, and for meaning-based was .72 for women and .65 for men. Exploratory factor analyses were run separately for women and men and yielded a 4-factor solution in both cases, with all items loading highly (above .40; Matsunaga, 2010) on the expected factors.

**Data Analyses**

A series of preliminary analyses were conducted, including bivariate correlations between study variables separately for women and men and within couples to test for interdependence within dyads. Differences between dyad members in each of the study variables were tested using repeated measures ANOVA. To test for the need to include covariates or confounding variables in the APIMeMs, women's and men's stress and coping were correlated (Pearson's correlation) with age, length of the relationship, and duration of infertility, and also compared (ANOVA) among groups based on previous fertility treatments (i.e., yes or no), infertility counseling (i.e., yes or no), infertility type (i.e., primary or secondary), and infertility cause (i.e., female factors, male factors, mixed, or unexplained). In addition, among the couples with secondary infertility, coping and stress were compared between groups based on previous abortions or live births. Variables that were

correlated with the mediator or outcome at $r \geq .30$ (Frigon & Laurencelle, 1993) or had a significant

association with these variables for either women or men were included in the models.

Using structural equation modeling (Lederman & Kenny, 2017), a simple APIM (Kenny et al., 2006) was preliminarily applied to investigate the direct associations of women's and men's support from spouse and social network with both individual and partner stress. To test for the role of each coping strategy in mediating these associations, four APIMeMs (Ledermann et al., 2011) were then estimated. If significant direct associations emerged in the simple APIM, they were maintained in the APIMeMs. Prior to dyadic analyses, the study variables were standardized using the means and standard deviations computed across the entire sample (Kenny et al., 2006). Empirical distinguishability of dyad members by gender was preliminarily tested using the omnibus test of distinguishability (Kenny et al., 2006), following the steps outlined by Ackerman, Donnellan, and Kashy (2011). A model was first tested in which the means, variances, and intrapersonal and interpersonal correlations were constrained to be equal across dyad members. In case of a significant omnibus test, the model was re-estimated by constraining only the correlations. If this second omnibus test was also significant, we tested whether associations differed across dyad members by constraining each path as equal and testing each constraint individually (Garcia et al., 2015; Ledermann et al., 2011). For each equality constraint, a $\chi^2$ difference test ($\Delta\chi^2$) was conducted to determine if holding that association equal across dyad members would cause a significant decrease in model fit. In case of a nonsignificant $\Delta\chi^2$, the path was held equal across dyad members for model parsimony. All models were tested using maximum likelihood estimation. Goodness of fit was evaluated using the following criteria: root mean square error of approximation (RMSEA) < .06, standardized root mean-square residual (SRMR) < .08, and comparative fit index (CFI) $\geq$ .95 (Hu & Bentler, 1999). A bootstrapping procedure (Preacher & Hayes, 2008) was used to estimate and test the indirect associations in the APIMeMs. We inferred consistent mediation if the indirect association and the corresponding direct association were of the same sign, and inconsistent mediation if these had opposite signs (MacKinnon, Krull, & Lockwood, 2000).

308   The sample size was established a priori as to meet the recommended ratio of at least five

309   observations per each estimated parameter in structural modeling and to reach enough power (.80)

310   to detect a mediated effect assuming small-to-medium sizes of the paths (Fritz & MacKinnon,

311   2007). Interpretation of results was based on statistical significance ($p < .05$ and bootstrapped 95%

312   confidence intervals not including zero for indirect associations) and measures of effect size for the

313   preliminary analyses. Pearson's $r$ of .10 was considered small, .30 medium, and .50 large; Cohen's

314   $d$ of 0.20, 0.50, and 0.80 were considered small, medium and large, respectively (Cohen, 1988).

315   APIM and APIMeMs were estimated using path analysis in Mplus 6.1 (Muthén & Muthén, 1998-

316   2010) and all other analyses were conducted with IBM SPSS 23.

<div align="center">

**Results**

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**Infertility-Related Characteristics**

319   Most couples ($n = 129$, 64.2%) were trying to have a child for over two years ($M = 2.94$, $SD =$

320   1.27, range 1-5 years) and 68.2% were primary infertile ($n = 137$). Among secondary infertile

321   couples ($n = 64$), 70.3% had spontaneous abortions ($n = 45$), 29.7% live births ($n = 19$) from

322   previous spontaneous conceptions, and none reported conceptions from previous fertility treatment.

323   As to the diagnosed causes, infertility was due to female factors in 37.8% ($n = 76$), to male factors

324   in 27.4% ($n = 55$), to mixed factors in 17.4% ($n = 35$), and was unexplained in 17.4% of couples ($n$

325   $= 35$). Prior to ART, 28.4% of couples ($n = 57$) had undergone ovarian stimulation plus timed

326   intercourse or intrauterine insemination. In 12.9% of couples ($n = 26$), the woman had received

327   infertility counseling.

**Preliminary Analyses**

329   Correlations among same variables in the dyads were all positive, indicating that the higher

330   score in stress, support, and coping a dyad member reported, the higher the partner's score.

331   Between-partner correlations were significant for all variables except meaning-based coping (Table

332   S1 in the online supplementary material). Results of repeated measures ANOVAs indicated that

333   women reported slightly higher stress than men, $F(1,176) = 7.34$, $p = .007$, $d = 0.30$. Women and

men did not differ in support from spouse, $F(1,176) = 3.06$, $p = .08$, $d = 0.01$, and from social network, $F(1,176) = 1.47$, $p = .23$, $d = 0.16$, nor in the use of meaning-based coping, $F(1,176) = 0.13$, $p = .72$, $d = 0.17$. Women reported moderately greater use of active-avoidance, $F(1,176) = 8.07$, $p = .005$, $d = 0.44$, active-confronting, $F(1,176) = 5.24$, $p = .023$, $d = 0.55$, and passive-avoidance coping, $F(1,176) = 11.38$, $p = .001$, $d = 0.60$, than men, $F(1,176) = 7.34$, $p = .007$, $d = 0.30$ (Table S2 in the online supplementary material). The correlations of age, length of relationship, and duration of infertility with stress and coping were small, ranging from -.21 to .14 for women, and from -.14 to .15 for men, and thus were not included in the APIMeMs (Table S1 in the online supplementary material). Interaction and main effects in ANOVAs were nonsignificant, thus mean scores in stress and coping did not vary depending on fertility treatment prior to ART (i.e., yes or no), or infertility type (i.e., primary or secondary) and cause (i.e., female factors, male factors, mixed, or unexplained) in either women or men (Table S2 in the online supplementary material). The only exception was a significant association of infertility counseling (i.e., yes or no) with women's meaning-based coping. Therefore, this variable was entered in the APIMeM that included meaning-based coping. In secondary infertile couples, having had spontaneous abortions or live births from previous spontaneous conceptions was unrelated to coping and stress for both women and men (Table S2 in the online supplementary material).

**Simple APIM**

**Empirical distinguishability.** The omnibus test constraining means, variances and correlations, $\chi^2(10) = 34.69$, $p < .001$, and that constraining only the correlations, $\chi^2(4) = 12.05$, $p = .02$, both indicated distinguishability by gender. Subsequent tests constraining each association as equal among dyad members indicated that there were significant gender differences in the direct associations of support from social network with both individual, $\Delta\chi^2(1) = 8.35$, $p = .004$, and partner stress, $\Delta\chi^2(1) = 9.10$, $p = .003$. These paths were thus allowed to be freely estimated across gender. The model fit was excellent, $\chi^2(2) = 2.43$, $p = .30$, RMSEA = .03, SRMR = .02, CFI = .99.

**Direct associations.** There was a direct inverse association of women's and men's support

from spouse with both individual, $b = -.23$, $SE = .05$, $z = -4.75$, $p < .001$, and partner stress, $b = -.12$,

$SE = .05$, $z = -2.36$, $p = .02$. The direct association of support from social network with individual

stress was nonsignificant for women, $b = -.06$, $SE = .08$, $z = -.77$, $p = .44$, but positive and

significant for men, $b = .22$, $SE = .07$, $z = 3.16$, $p = .002$. The direct association of support from

social network with partner stress was negative and significant for women, $b = -.25$, $SE = .08$, $z = -3.16$, $p = .001$, but nonsignificant for men, $b = .06$, $SE = .08$, $z = 0.81$, $p = .42$ (Figure S1 in the

online supplementary material). Thus, women's support from social network was unrelated to their

own stress but was directly associated with lower stress in their partners. In contrast, men's support

from social network was directly associated with their own higher stress but was unrelated to that of

their partners.

**APIMeMs**

Indirect associations in the APIMeMs are reported in Table 1, where those with confidence

intervals that do not include zero are considered significant. Path estimates are shown in Figures 1

to 4. Results are presented below separately for each coping strategy.

**Active-avoidance coping.**

*Empirical distinguishability.* The omnibus test constraining means, variances and correlations

$\chi^2(18) = 61.50$, $p < .001$, and that constraining only the correlations, $\chi^2(11) = 20.29$, $p = .04$, both

indicated distinguishability by gender. Subsequent tests constraining each individual path as equal

among dyad members indicated that there was a significant gender difference in the association of

support from spouse with individual active-avoidance coping, $\Delta\chi^2(1) = 6.02$, $p = .01$. This path was

thus allowed to be freely estimated across gender. The model showed an excellent fit (see Figure 1).

*Indirect associations.* Active-avoidance coping consistently mediated the relationships

between support from spouse and individual and partner stress (see Table 1). The association of

support from spouse with individual active-avoidance coping was nonsignificant for women, $b = -.12$, $SE = .07$, $z = -1.58$, $p = .12$, but negative and significant for men (see Figure 1). In men only,

lower support from spouse was related to greater individual use of active-avoidance coping, and thus to higher stress in both themselves and their partners. For both women and men, lower support from spouse was associated with greater use of active-avoidance coping in their partners, and thus with higher stress in both themselves and their partners. After the inclusion of the mediator, the direct association of women's and men's support from spouse with their partners' stress was no longer significant, as it was in the simple APIM. Active-avoidance coping was not a mediator in the relationship between support from social network and stress as it was not significantly associated with support from social network.

**Active-confronting coping.**

***Empirical distinguishability.*** The omnibus test constraining means, variances and correlations was significant, $\chi^2(18) = 58.70$, $p < .001$. However, the omnibus test constraining only the correlations was nonsignificant, $\chi^2(10) = 13.43$, $p = .20$, indicating that although there were mean-level differences, dyad members were not distinguishable in the intrapersonal and interpersonal correlations. All paths were thus set equal across gender. The model fit was adequate (see Figure 2).

***Indirect associations.*** Active-confronting coping did not mediate the relationship between support from spouse and stress, as it was unrelated to support from spouse. This strategy instead consistently mediated the relationship between women's and men's support from social network and their own stress. It also inconsistently and consistently mediated, respectively, the relationship between women's and men's support from social network and their partners' stress (see Table 1). For both women and men, greater support from social network was linked to greater individual use of active-confronting coping, and thus to higher individual and partner stress (see Figure 2). The direct association of women's support from social network with lower partners' stress was suppressed by women's support from social network being related to greater active-confronting coping.

**Passive-avoidance coping.**

410      ***Empirical distinguishability.*** The omnibus test constraining means, variances and correlations,

411      $\chi^2(18) = 76.72$, $p < .001$, and that constraining only the correlations, $\chi^2(10) = 21.28$, $p = .02$, both

412      indicated that dyad members were distinguishable by gender. Subsequent tests constraining each

413      individual path as equal among dyad members indicated that there were significant gender

414      differences in the associations of support from spouse with individual, $\Delta\chi^2(1) = 10.01$, $p =. 002$, and

415      partner passive-avoidance coping, $\Delta\chi^2(1) = 7.44$, $p = .006$, and of support from social network with

416      individual passive-avoidance coping, $\Delta\chi^2(1) = 6.37$, $p = .01$. These paths were thus allowed to be

417      freely estimated across gender. The model showed an excellent fit (see Figure 3).

418      ***Indirect associations.*** Passive-avoidance coping consistently mediated the relationship between

419      men's support from spouse and their own stress (see Table 1). The association of support from

420      spouse with individual passive-avoidance coping was nonsignificant for women, $b = .04$, $SE = .07$, $z$

421      $= 0.55$, $p = .58$, but negative and significant for men (see Figure 3). Lower men's support from

422      spouse was linked to a greater individual use of passive-avoidance coping, and thus to higher

423      individual stress. Passive-avoidance coping consistently mediated also the relationship between

424      men's support from spouse and their partners' stress (see Table 1). The association of support from

425      spouse with partner passive-avoidance coping was nonsignificant for women, $b = .01$, $SE = .08$, $z =$

426      $0.13$, $p = .90$, but negative and significant for men (see Figure 3). Lower men's support from spouse

427      was related to greater use of passive-avoidance coping in their partners, and thus to higher female

428      stress. After the inclusion of the mediator, the direct association of support from spouse with the

429      partner's stress was no longer significant, as it was in the simple APIM.

430      The association of support from social network with individual passive-avoidance coping was

431      nonsignificant for women, $b = -.08$, $SE = .08$, $z = -0.96$, $p = .34$, but positive and significant for men

432      (see Figure 3). Passive-avoidance coping consistently mediated the relationship between men's

433      support from social network and their own stress, but did not mediate the association of women's

434      support from social network with their partners' stress (see Table 1). For men only, greater support

435 from social network was linked to a greater individual use of passive-avoidance coping, and thus to

436 higher individual stress.

437 **Meaning-based coping.**

438 ***Empirical distinguishability.*** The omnibus test constraining means, variances and correlations

439 was significant, $\chi^2(25) = 51.10$, $p = .002$, and that constraining only the correlations was marginally

440 significant, $\chi^2(17) = 27.40$, $p = .053$. Subsequent tests constraining each individual path as equal

441 among dyad members indicated that there were significant differences in the associations of support

442 from spouse with individual meaning-based coping, $\Delta\chi^2(1) = 8.47$, $p = .004$, and of meaning-based

443 coping with individual stress, $\Delta\chi^2(1) = 5.67$, $p = .017$. These paths were thus allowed to be freely

444 estimated across gender. The fit of this model was excellent (see Figure 4), and significantly better

445 than that of a model with all paths constrained to be equal across gender, $\Delta\chi^2(2) = 10.01$, $p = .007$.

446 ***Indirect associations.*** The association of support from spouse with individual meaning-based

447 coping was positive and significant for women, but nonsignificant for men, $b = -.01$, $SE = .09$, $z = -$

448 $0.09$, $p = .93$. The significant distinguishability by gender in the association of coping with

449 individual stress was due to the different sign of paths across gender; however, this association was

450 nonsignificant for both women, $b = -.01$, $SE = .07$, $z = -0.09$, $p = .93$, and men, $b = .14$, $SE = .07$, $z =$

451 $1.92$, $p = .06$. The only significant path was between women's support from spouse and their greater

452 meaning-based coping (see Figure 4).

453 **Discussion**

454 To our knowledge, this was the first dyadic study to examine the relationships between

455 infertility-specific support and infertility stress among infertile couples starting ART treatment, and

456 to test whether these associations were mediated by infertility-related coping. We focused on

457 domains unique to infertility as to better capture the experience of infertility (Greil et al., 2011). In

458 particular, we chose infertility stress as an outcome as it is considered a distinct construct from

459 general stress, which may lead to more generalized distress in other domains of life and respond

460 differently to interventions (Cesta et al., 2018; Sexton et al., 2010; Slade et al., 2007). Noteworthy,

461 in order to address perceived social support specific to infertility, we included in our study only

462 couples who had disclosed their infertility status to their social network.

463     The findings showed that social support was related to individual and partner stress, and this

464 relationship was either direct or mediated by individual and partner coping, with some differences

465 based on gender, support from spouse or from social network, and coping strategies.

466 **Direct Associations of Infertility-Specific Support with Infertility Stress**

467     The first hypothesis on direct associations of social support with stress was confirmed for

468 support from spouse: greater perceived support from spouse was directly associated with lower

469 stress at the individual level for both women and men, in line with previous evidence (Chochovski

470 et al., 2013; Gourounti et al., 2010; Martins et al., 2011, 2014, 2016; Sexton & Bird, 2015; Ying et

471 al., 2015). At the partner level, a higher perception of support from spouse had been previously

472 associated with the partner's lower stress among women only (Martins et al., 2014); in our study,

473 the same association was found for both genders. As for support from social network, at the

474 individual level, it was not directly linked to lower stress in women, in contrast with previous

475 evidence (Martins et al., 2011, 2014; Sexton & Bird, 2015). Men's greater perceived support from

476 social network was instead directly related to their own higher stress, contrary to hypotheses based

477 on the majority of previous studies but in line with a qualitative study by Ying et al. (2015). A

478 possible explanation might be related to social role expectations and cultural stereotypes about

479 masculinity as related to sexual potency. Infertility might be perceived as a threat to men's gender

480 identity (Gannon, Glover, & Abel, 2004) and potentially affect the way men use the support sources

481 in relation to their infertility problem. It has indeed been reported that men prefer to receive support

482 through online communities rather than openly share their emotions about infertility and its

483 treatment (Richard, Badillo-Amberg, & Zelkowitz, 2017). Thus, for men adhering to masculinity

484 norms, being offered the support of their social network in relation to infertility might increase their

485 stress. At the partner level, partly in line with hypotheses, greater perceived support from social

486  network was directly associated with lower partner stress in women but not in men, as found in a

487  previous study (Martins et al., 2014).

488  **Indirect Associations of Infertility-Specific Support with Infertility Stress**

489  Regarding the second hypothesis, a number of indirect associations between social support and

490  individual and partner stress were found, which were generally in the same directions as those

491  hypothesized but varied depending on the source of support and/or on gender. The partner's coping

492  also mediated the individual- and partner-level associations between social support and stress.

493  **Avoidance coping strategies.** In men, greater perceived support from spouse was associated

494  with their own lower stress through their lower use of both active- and passive-avoidance coping. In

495  addition, men's greater perceived support from spouse was associated with lower women's stress

496  through both men's lower use of active-avoidance coping and women's lower use of passive-

497  avoidance coping. In both women and men, greater perceived support from spouse was associated

498  with lower levels of stress in themselves and in their partners through a lower use of active-

499  avoidance coping by their partners. Lastly, among men, a greater perceived support from social

500  network was associated with their own higher stress also through their greater use of passive-

501  avoidance coping. Active-avoidance coping was instead not associated with support from social

502  network. Altogether, our findings reinforce the potential adverse effect of active- and passive-

503  avoidance coping for individual and partner infertility stress, in line with previous findings (Martins

504  et al., 2011; Peterson et al., 2008; Schmidt, Holstein, et al., 2005).

505  **Active-confronting coping.** Active-confronting coping was unrelated to support from spouse.

506  In both women and men greater perceived support from social network was associated with higher

507  individual and partner stress through a greater individual use of active-confronting. Thus, as

508  suggested by an inconsistent mediation effect, the potentially protective role of women's support

509  from social network against their partners' stress might be suppressed when women engage in

510  active-confronting coping. Previous dyadic studies also found that women's use of active-

511  confronting coping was linked to worse adjustment in their partners, while the same was not

512     observed among men (Peterson et al., 2008, 2009; Volmer, Rösner, Toth, Strowitzki, &

513     Wischmann, 2017). Altogether, these findings point to the potentially maladaptive role of active-

514     confronting coping for individual and partner infertility stress in couples starting their first ART

515     treatment, in line with previous dyadic findings (Peterson et al., 2008, 2009; Volmer et al., 2017).

516     On the one hand, this might be attributable to the problem-focused and emotional venting

517     components of active-confronting coping. The goodness-of-fit hypothesis (Lazarus & Folkman,

518     1984) highlights the importance of matching the coping effort to the controllability of the situation,

519     suggesting that problem-focused coping promotes adjustment in controllable situations, while with

520     low-control stressors like infertility it might result in higher frustration and worse adaptation (e.g.,

521     Benyamini, Gozlan, & Kokia, 2004). There is also evidence that, among emotion-focused

522     strategies, behaviors such as emotional venting can intensify negative feelings and frustration,

523     probably due to rumination about the stressor (e.g., Nils & Rimé, 2012). On the other hand, the

524     potentially negative role of active-confronting coping might be in part attributable to the timing of

525     data collection. Couples at the early stage of fertility treatment might be characterized by an acute

526     stress reaction (Berg & Wilson, 1991) that can reduce the efficacy of an active-confronting coping

527     strategy. However, adopting such a strategy might yield to better outcomes in the long term as it

528     was suggested in a previous longitudinal study of infertile individuals (Stanton, 2011).

529     **Meaning-based coping.** This coping strategy was not a mediator in the relationship between

530     support and stress. Previous studies found an association between meaning-based coping and

531     infertility stress (Peterson et al, 2008, 2009; Schmidt, Holstein, et al., 2005; Volmer et al., 2017)

532     that was not observed in this study. This might be attributable to that the couples in the present

533     study were seeking their first ART treatment. As previously suggested (Peterson et al., 2009), it

534     may take time to experience the benefits of meaning-based coping, as it implies a thorough

535     reflection on and a redefinition of the infertility experience. Thus, couples attempting ART

536     treatment for the first time could have not found new meaning through the infertility experience yet.

537     **Limitations and Future Directions**

538      The present study has a number of limitations that must be acknowledged. First, the data relied

539      exclusively on self-report measures. Therefore, future studies that use multiple informants and

540      collect both self- and partner-reports would be helpful in reducing shared method variance (Orth,

541      2013). Second, the cross-sectional nature of the data does not allow conclusions about the

542      directionality of the identified associations. Although the tested relationships were theoretically

543      driven by the transactional theory of stress, future replication studies using longitudinal data are

544      encouraged to rule out possible reverse effects. Furthermore, in accordance with the transactional

545      theory of stress, we adopted a situational approach to coping as a response to the stressful

546      infertility-related situation. A different, dispositional approach could be adopted in future studies, in

547      which coping, conceptualized as a relatively stable characteristic, would act as a moderating rather

548      than mediating variable (Wu & Zumbo, 2008). Third, a number of factors might have influenced the

549      results. The duration of infertility was assessed as time trying to get pregnant (Moura-Ramos,

550      Gameiro, Canavarro, Soares, & Almeida-Santos, 2016), regardless of the time since infertility

551      diagnosis. We could not distinguish between the types of conventional fertility treatments (i.e.,

552      timed intercourse or intrauterine insemination) previously undergone by almost one third of

553      couples, since this information was self-reported and previous treatments were not necessarily

554      conducted at the same clinic. The couples in our study were entering their first ART treatment,

555      which is a situation of high anxiety and uncertainty. In the measurement of infertility-specific

556      support, support from spouse was assessed using only two items with reliability indices between .60

557      and .70. Also, the reliability of passive-avoidance and meaning-based coping scales, although

558      higher than those reported in other studies (e.g., Martins et al., 2011; Schmidt, Christensen, et al.,

559      2005; Schmidt, Holstein, et al., 2005), was in part slightly below the recommended thresholds.

560      Because low reliability attenuates observed relationships but cannot result in spuriously high

561      associations (Cohen, Cohen, West, & Aiken, 2003), the null results involving support from spouse,

562      passive-avoidance and meaning-based coping should be interpreted cautiously, but the relationships

563      found in this study for the mentioned variables likely reflect associations that do exist. Fourth, in

564 order to assess social support specific to infertility, we included only couples who had disclosed

565 their infertile condition to others, which limits the generalizability of our findings. Since the

566 benefits of social support against infertility stress might cease when the infertile condition is not

567 disclosed (Martins et al., 2013), future dyadic studies should elucidate the relationships between

568 social support, coping, and stress in couples keeping infertility secret. Future studies are also

569 encouraged to address both general and infertility-specific social support, in order to clarify how

570 they relate to each other and whether they differentially impact coping and stress. Fifth, the data

571 were from a single clinic and a single country; thus, cross-cultural, multicenter studies are needed to

572 clarify whether the identified dyadic associations represent a common pattern. Finally, sample-size

573 requirements (Fritz & MacKinnon, 2007) did not allow including all coping strategies in a single

574 APIMeM or distinguishing between different sources of social network support and between

575 domains of infertility stress. To overcome this limitation, larger samples should be recruited to

576 allow for testing of more complex multiple mediation models with a dyadic approach.

577 **Conclusions and Implications**

578     This study provides new insight into the role of infertility-specific support for infertile couples

579 and suggests new hypotheses to be tested in future longitudinal studies. The first one is that

580 infertility-specific support might protect against infertility stress, both individually and as a couple,

581 when it comes from the partner. This is probably linked to that the marital relationship is perceived

582 as a primary source of support under stressful circumstances, and was found to improve in couples

583 undergoing their first ART treatment (Holter, Anderheim, Bergh, & Möller, 2006). Each partner

584 might benefit from her/his own as well as the other partner's perceptions of receiving support

585 within the couple also indirectly, as these perceptions can inhibit the individual and partner use of

586 avoidance coping strategies. Another hypothesis is that, in contrast, receiving infertility-specific

587 support from people outside the couple might exacerbate stress at both the individual and couple

588 levels either directly or by encouraging the use of active-confronting and passive-avoidance coping.

589     The results of this study have implications for clinicians working with infertile individuals and

590     couples. Women and men reporting infertility stress might benefit from couple interventions aimed

591     at promoting an open communication between partners (e.g., Sormunen, Aanesen, Fossum,

592     Karlgren, & Westerbotn, 2018) as well as reciprocal support and understanding in relation to their

593     infertility problem. This type of intervention may also help reduce the use of avoidance coping

594     strategies that are maladaptive for the couple. Coping skills training could also help reduce the use

595     of active-confronting coping strategies, at least at the beginning of fertility treatment attempts. In

596     addition, given the potentially adverse role of support from social network, clinicians could help

597     couples identify the people to whom they may disclose their infertility status, by selecting the ones

598     who might be truly and effectively supportive within their social network.

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757

Table 1

*Indirect Effects in the APIMeMs*

| Source of support | Support | → | Coping | → | Stress | Active-avoidance | | | Active-confronting | | | Passive-avoidance | | | Meaning-based | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | *b* | *SE* | 95% CI | *b* | *SE* | 95% CI | *b* | *SE* | 95% CI | *b* | *SE* | 95% CI |
| Spouse | W | → | W | → | W | -.05 | .03 | [-.11, .01] | -.01 | .02 | [-.05, .02] | .01 | .02 | [-.03, .05] | -.01 | .02 | [-.04, .03] |
| | M | → | M | → | M | -.12 | .03 | [-.19, -.07] | -.01 | .02 | [-.05, .02] | -.07 | .03 | [-.13, -.03] | -.01 | .01 | [-.04, .02] |
| | W | → | M | → | W | -.01 | .01 | [-.03, -.01] | -.01 | .01 | [-.02, .01] | .01 | .01 | [-.02, .02] | -.01 | .01 | [-.03, .01] |
| | M | → | W | → | M | -.01 | .01 | [-.03, -.01] | -.01 | .01 | [-.02, .01] | -.02 | .02 | [-.06, .01] | -.01 | .01 | [-.03, .01] |
| | M | → | M | → | W | -.03 | .02 | [-.07, -.01] | -.01 | .01 | [-.02, .01] | -.03 | .02 | [-.07, .01] | -.01 | .01 | [-.02, .01] |
| | W | → | W | → | M | -.01 | .01 | [-.04, .01] | -.01 | .01 | [-.02, .01] | .01 | .01 | [-.01, .03] | .02 | .01 | [-.01, .05] |
| | M | → | W | → | W | -.04 | .02 | [-.09, -.01] | -.01 | .01 | [-.03, .02] | -.06 | .02 | [-.11, -.03] | .01 | .01 | [-.01, .02] |
| | W | → | M | → | M | -.04 | .02 | [-.09, -.01] | -.01 | .01 | [-.03, .02] | .01 | .02 | [-.04, .04] | -.01 | .01 | [-.04, .00] |
| Social network | W | → | W | → | W | -.01 | .02 | [-.04, .04] | .06 | .02 | [.03, .10] | -.02 | .02 | [-.07, .02] | .00 | .01 | [-.01, .01] |
| | M | → | M | → | M | -.01 | .02 | [-.04, .04] | .06 | .02 | [.03, .10] | .04 | .02 | [.01, .09] | .01 | .01 | [-.01, .03] |
| | W | → | M | → | W | -.01 | .01 | [-.02, .01] | .01 | .01 | [-.01, .02] | .01 | .01 | [-.01, .02] | .01 | .01 | [-.01, .03] |
| | M | → | W | → | M | | | | | | | | | | | | |
| | M | → | M | → | W | -.01 | .01 | [-.01, .01] | .02 | .01 | [.01, .05] | .02 | .01 | [-.01, .05] | .01 | .01 | [-.01, .02] |

| | | | | | b | SE | CI | b | SE | CI | b | SE | CI | b | SE | CI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W | → | W | → | M | -.01 | .01 | [-.01, .01] | .02 | .01 | [.01, .05] | -.01 | .01 | [-.04, .01] | .01 | .01 | [-.01, .02] |
| M | → | W | → | W | -.01 | .02 | [-.05, .03] | .01 | .02 | [-.03, .03] | .01 | .01 | [-.03, .03] | .00 | .01 | [-.02, .01] |
| W | → | M | → | M | -.01 | .02 | [-.05, .03] | .01 | .02 | [-.03, .03] | .01 | .01 | [-.03, .03] | .01 | .01 | [-.01, .04] |

*Note.* W and M indicate women and men, respectively. APIMeM = actor-partner interdependence mediation model; *b* = standardized estimate; *SE* = standard error; CI = confidence interval. CI intervals not including zero are considered statistically significant.

*Figure 1.* APIMeM with active-avoidance coping as the mediator. Standardized path estimates are reported. Standard errors are in parentheses. Nonsignificant paths and within- and between-partner correlations are omitted from the figure for clarity. Model fit statistics: $\chi^2(9) = 9.39$, $p = .40$, RMSEA = .02, SRMR = .03, CFI = 1.00.

$^*p < .05.$ $^{**}p < .01.$ $^{***}p < .001.$
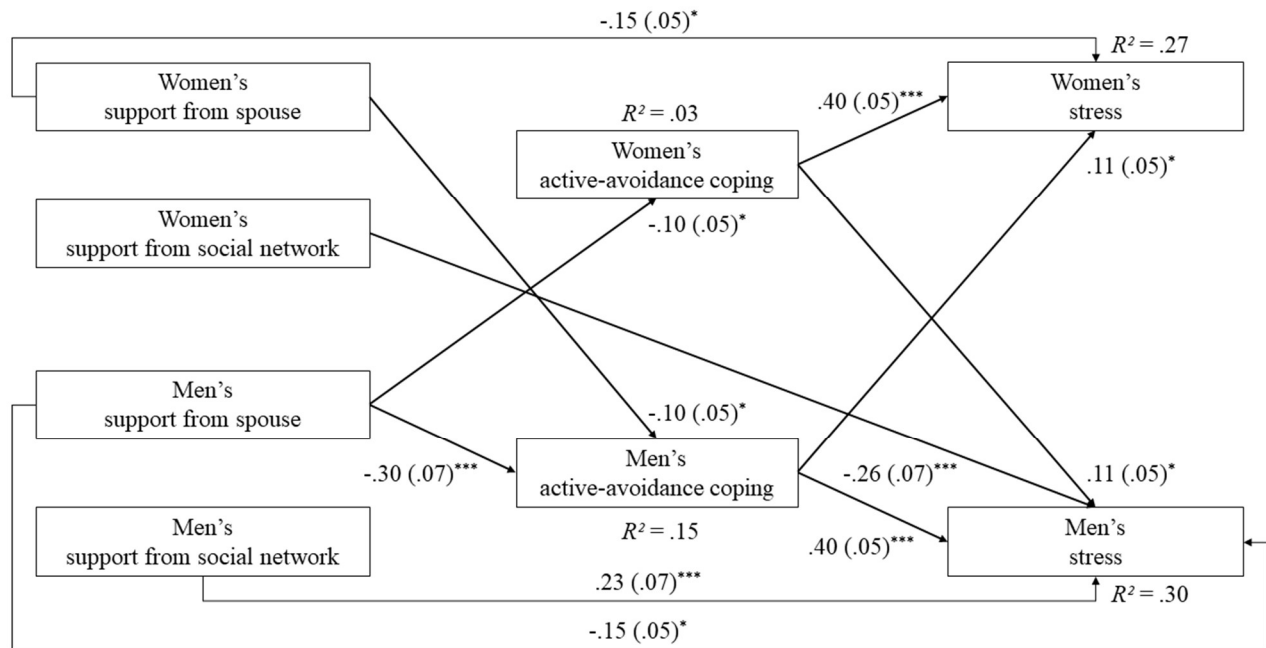
*Figure 2.* APIMeM with active-confronting coping as the mediator. Standardized path estimates are reported. Standard errors are in parentheses. Nonsignificant paths and within- and between-partner correlations are omitted from the figure for clarity. Model fit statistics: $\chi^2(10) = 15.01$, $p = .13$, RMSEA = .05, SRMR = .04, CFI = .96.

$^*p < .05.$ $^{**}p < .01.$ $^{***}p < .001.$
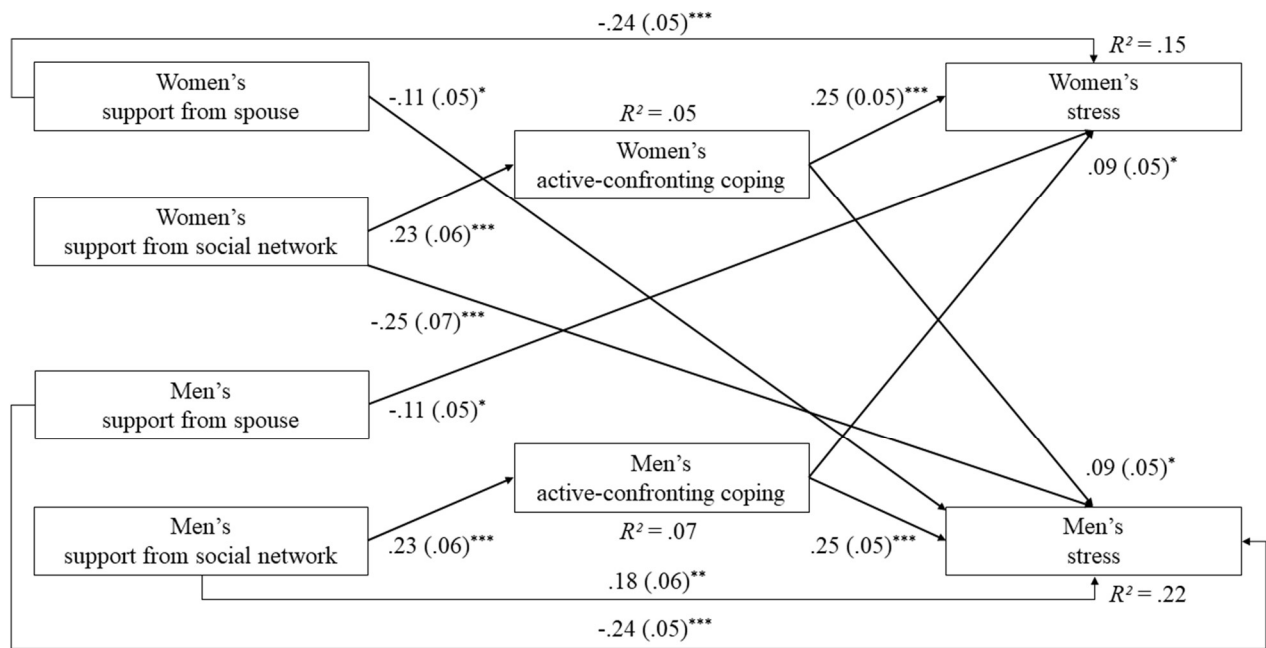
*Figure 3.* APIMeM with passive-avoidance coping as the mediator. Standardized path estimates are reported. Standard errors are in parentheses. Nonsignificant paths and within- and between-partner correlations are omitted from the figure for clarity. Model fit statistics: $\chi^2(7) = 2.82$, $p = .90$, RMSEA = .00, SRMR = .01, CFI = 1.00.

$^*p < .05.$ $^{**}p < .01.$ $^{***}p < .001.$
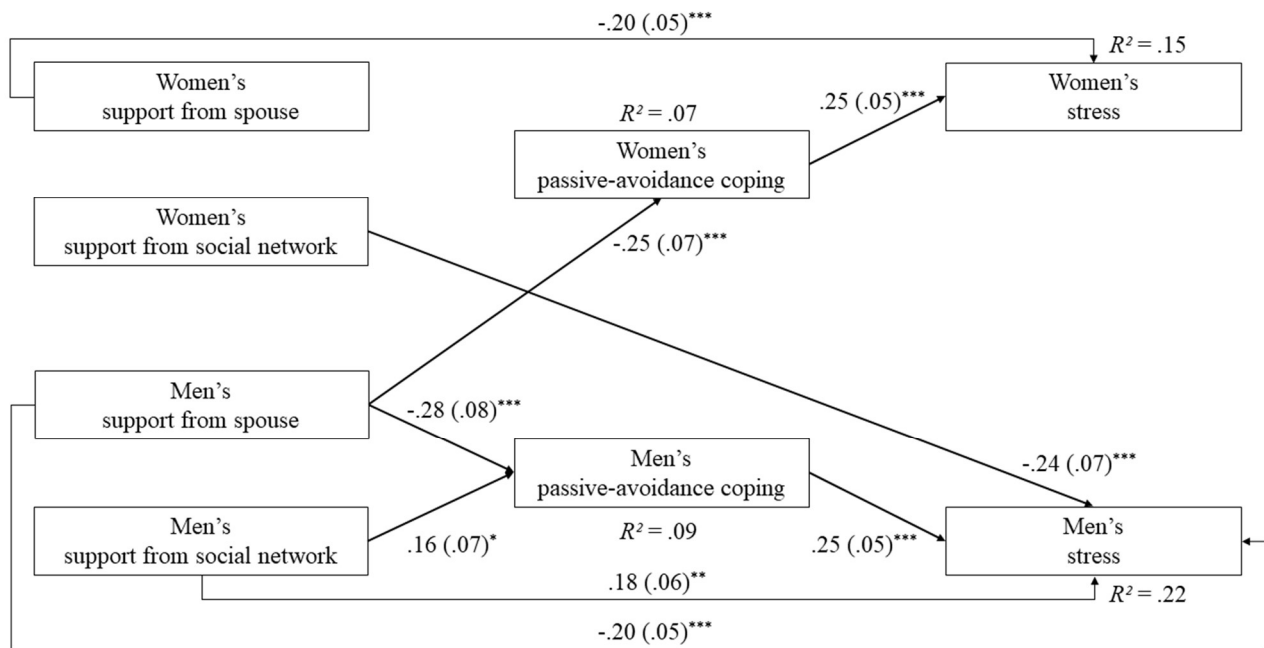
*Figure 4.* APIMeM with meaning-based coping as the mediator. Although not shown, infertility-related counseling was included as a covariate in the model. Standardized path estimates are reported. Standard errors are in parentheses. Nonsignificant paths and within- and between-partner correlations are omitted from the figure for clarity. Model fit statistics: $\chi^2(15) = 15.22$, $p = .46$; RMSEA = .01, SRMR = .04, CFI = 1.00.

$^*p < .05.$ $^{**}p < .01.$ $^{***}p < .001.$
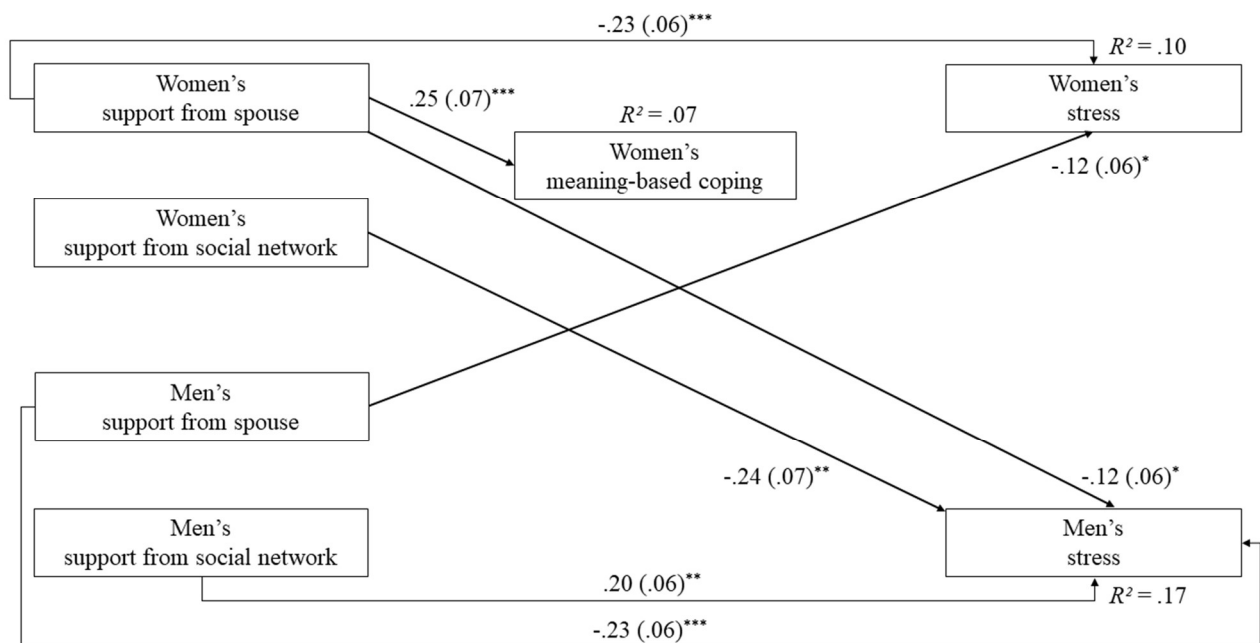
Supplemental Table S1

*Correlations for Study Variables and Potential Covariates/Confounders*

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Age (women) | - | | | | | | | | | | | | | | | | |
| 2. Age (men) | .56[a] | - | | | | | | | | | | | | | | | |
| 3. Length of relationship | .13 | .18[c] | - | | | | | | | | | | | | | | |
| 4. Duration of infertility | -.02 | -.03 | .36[a] | - | | | | | | | | | | | | | |
| 5. Support spouse (women) | -.13 | -.18[b] | -.03 | .01 | - | | | | | | | | | | | | |
| 6. Support spouse (men) | .04 | .00 | .02 | .07 | .29[a] | - | | | | | | | | | | | |
| 7. Support social network (women) | .03 | -.09 | -.06 | -.03 | .32[a] | .07 | - | | | | | | | | | | |
| 8. Support social network (men) | -.08 | -.07 | -.04 | .02 | -.03 | .23[b] | .47[a] | - | | | | | | | | | |
| 9. Active-avoidance (women) | -.14[c] | -.14[c] | .03 | .11 | -.13 | -.22[b] | -.08 | -.12 | - | | | | | | | | |
| 10. Active-avoidance (men) | -.08 | -.05 | .04 | .02 | -.16[c] | -.39[a] | -.03 | -.08 | .31[a] | - | | | | | | | |
| 11. Active-confronting (women) | -.02 | .01 | -.05 | -.02 | .16[c] | -.02 | .32[a] | .14[c] | .12 | .15[c] | - | | | | | | |
| 12. Active-confronting (men) | -.08 | -.14[c] | .03 | -.06 | -.01 | -.09 | .11 | .17[c] | .05 | .13 | .18[c] | - | | | | | |
| 13. Passive-avoidance (women) | -.21[b] | -.10 | -.10 | .02 | -.06 | -.26[a] | -.09 | -.07 | .39[a] | .28[a] | .19[b] | .04 | - | | | | |
| 14. Passive-avoidance (men) | -.10 | -.09 | .03 | .04 | -.07 | -.24[a] | .04 | .12 | .19[b] | .36[a] | .03 | .29[a] | .27[a] | - | | | |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15. Meaning-based (women) | -.16[c] | -.07 | .06 | .10 | .24[a] | -.04 | .12 | .07 | .04 | .02 | .35[a] | .03 | .19[b] | -.08 | - | | |
| 16. Meaning-based (men) | .01 | -.03 | .15[c] | .13 | -.03 | -.03 | .01 | .05 | .15[c] | .25[a] | .07 | .34[a] | .13 | .38[a] | .12 | - | |
| 17. Stress (women) | .00 | .04 | .12 | .14[c] | -.23[a] | -.21[b] | -.12 | .02 | .50[a] | .31[a] | .23[a] | .10 | .33[a] | .17[c] | -.07 | .16[c] | - |
| 18. Stress (men) | -.07 | -.08 | .14 | .05 | -.24[a] | -.28[a] | -.18[b] | .08 | .22[b] | .43[a] | .10 | .27[a] | 0.24[a] | .30[a] | -.01 | .19[b] | .44[a] |

[a] $p \leq .001$. [b] $p < .01$. [c] $p < .05$.

Supplemental Table S2

*Frequencies (Proportions) of Infertility-Related Characteristics and Coping and Stress Mean Scores (SD) by Subgroups within Genders*

| | | Women | | | | | Men | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | n (%) | Active-avoidance | Active-confronting | Passive-avoidance | Meaning-based | Stress | Active-avoidance | Active-confronting | Passive-avoidance | Meaning-based | Stress |
| **MAR prior to ART** | | | | | | | | | | | |
| Yes | 57 | 9.04 | 14.18 | 8.37 | 12.81 | 43.19 | 7.33 | 12.23 | 6.54 | 13.14 | 34.18 |
| | (28.36) | (3.28) | (4.33) | (2.25) | (3.30) | (20.04) | (2.39) | (3.73) | (2.61) | (3.04) | (16.82) |
| No | 144 | 8.20 | 14.91 | 8.49 | 13.53 | 36.74 | 7.11 | 12.28 | 7.01 | 12.55 | 32.38 |
| | (71.64) | (2.97) | (4.63) | (2.69) | (3.69) | (18.59) | (2.77) | (4.58) | (2.71) | (3.83) | (20.05) |
| | | $F = 0.25^a$, | $F = 0.04^a$, | $F = 0.02^a$, | $F = 0.14^a$, | $F = 1.05^a$, | $F = 0.95^a$, | $F = 1.01^a$, | $F = 2.06^a$, | $F = 0.77^a$, | $F = 3.54^a$, |
| | | $d = 0.28$ | $d = 0.16$ | $d = 0.05$ | $d = 0.20$ | $d = 0.29$ | $d = 0.08$ | $d = 0.01$ | $d = 0.18$ | $d = 0.16$ | $d = 0.09$ |
| **Counseling** | | | | | | | | | | | |
| Yes | 26 | 9.19 | 13.42 | 8.88 | 13.04 | 45.81 | 7.62 | 12.65 | 6.81 | 13.58 | 40.19 |
| | (12.94) | (3.07) | (3.32) | (2.60) | (3.33) | (19.93) | (2.53) | (3.78) | (2.53) | (2.94) | (19.81) |
| No | 175 | 8.33 | 14.89 | 8.39 | 13.37 | 37.50 | 7.11 | 12.21 | 6.89 | 12.59 | 31.80 |
| | (87.06) | (3.07) | (4.68) | (2.56) | (3.63) | (18.90) | (2.69) | (4.43) | (2.72) | (3.71) | (18.89) |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | $F = 0.58^{a}$, | $F = 1.87^{a}$, | $F = 0.13^{a}$, | $F = 4.73^{a*}$, | $F = 0.14^{a}$, | $F = 0.66^{a}$, | $F = 0.16^{a}$, | $F = 1.15^{a}$, | $F = 0.15^{a}$, | $F = 1.49^{a}$, |
| | $d = 0.28$ | $d = 0.33$ | $d = 0.19$ | $d = 0.09$ | $d = 0.44$ | $d = 0.19$ | $d = 0.10$ | $d = 0.03$ | $d = 0.27$ | $d = 0.44$ |

**Infertility type**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Primary | 137 | 8.26 | 14.84 | 8.44 | 13.31 | 37.48 | 7.32 | 12.21 | 6.83 | 12.47 | 32.89 |
| | (68.16) | (2.95) | (4.62) | (2.60) | (3.85) | (19.38) | (2.77) | (4.30) | (2.65) | (3.62) | (19.57) |
| Secondary | 64 | 8.83 | 14.41 | 8.50 | 13.38 | 40.92 | 6.86 | 12.38 | 6.98 | 13.23 | 32.88 |
| | (31.84) | (3.34) | (4.41) | (2.50) | (2.99) | (18.70) | (2.43) | (4.48) | (2.78) | (3.62) | (18.43) |
| | | $F = 0.09^{a}$, | $F = 2.22^{a}$, | $F = 0.42^{a}$, | $F = 0.16^{a}$, | $F = 2.06^{a}$, | $F = 0.70^{a}$, | $F = 0.56$, | $F = 0.43$, | $F = 0.33^{a}$, | $F = 0.00^{a}$, |
| | | $d = 0.19$ | $d = 0.09$ | $d = 0.02$ | $d = 0.02$ | $d = 0.18$ | $d = 0.17$ | $d = 0.04$ | $d = 0.06$ | $d = 0.21$ | $d = 0.00$ |
| Abortions | 45 | 9.29 | 14.82 | 8.58 | 13.22 | 43.71 | 7.00 | 11.98 | 6.80 | 12.98 | 32.69 |
| | (70.31) | (3.37) | (4.73) | (2.48) | (3.19) | (17.91) | (2.27) | (3.76) | (2.67) | (3.63) | (15.76) |
| Live births | 19 | 7.74 | 13.42 | 8.32 | 13.74 | 34.32 | 6.53 | 13.32 | 7.42 | 13.84 | 33.32 |
| | (29.69) | (3.07) | (3.49) | (2.60) | (2.49) | (19.37) | (2.82) | (5.87) | (3.06) | (3.61) | (24.11) |
| | | $F = 2.98^{b}$, | $F = 1.35^{b}$, | $F = 0.15^{b}$, | $F = 0.39^{b}$, | $F = 3.51^{b}$, | $F = 0.50^{b}$, | $F = 1.20^{b}$, | $F = 0.66^{b}$, | $F = 0.76^{b}$, | $F = 0.02^{b}$, |
| | | $d = 0.48$ | $d = 0.32$ | $d = 0.11$ | $d = 0.18$ | $d = 0.52$ | $d = 0.20$ | $d = 0.30$ | $d = 0.23$ | $d = 0.24$ | $d = 0.03$ |

**Infertility cause**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Female factor | 76 | 8.62 | 14.70 | 8.51 | 13.32 | 41.88 | 7.53 | 12.67 | 7.08 | 13.05 | 33.38 |
| | (37.81) | (2.87) | (4.06) | (2.50) | (3.39) | (19.26) | (2.68) | (4.56) | (2.62) | (3.14) | (19.02) |
| Male factor | 55 | 7.84 | 13.71 | 8.33 | 13.31 | 35.82 | 7.05 | 12.47 | 6.85 | 13.20 | 34.40 |
| | (27.36) | (3.21) | (4.06) | (2.75) | (3.68) | (19.90) | (2.66) | (4.48) | (2.76) | (4.11) | (20.14) |
| Mixed | 35 | 8.74 | 15.43 | 8.03 | 13.60 | 35.77 | 6.54 | 12.37 | 7.00 | 12.06 | 30.54 |
| | (17.41) | (2.95) | (5.31) | (2.43) | (3.71) | (18.98) | (2.38) | (4.77) | (2.91) | (3.56) | (20.84) |
| Unexplained | 35 | 8.69 | 15.54 | 8.97 | 13.11 | 38.51 | 7.23 | 10.94 | 6.37 | 11.89 | 31.77 |
| | (17.41) | (3.42) | (5.32) | (2.55) | (3.87) | (17.70) | (2.89) | (2.91) | (2.51) | (3.79) | (16.53) |
| | | $F = 1.23^c$, | $F = 0.27^c$, | $F = 0.90^c$, | $F = 0.55^c$, | $F = 1.07^c$, | $F = 0.37^c$, | $F = 1.02^c$, | $F = 1.46^c$, | $F = 1.80^c$, | $F = 0.43^c$, |
| | | $\eta^2 = 0.02$ | $\eta^2 = 0.01$ | $\eta^2 = 0.02$ | $\eta^2 = 0.01$ | $\eta^2 = 0.02$ | $\eta^2 = 0.01$ | $\eta^2 = 0.02$ | $\eta^2 = 0.02$ | $\eta^2 = 0.03$ | $\eta^2 = 0.01$ |
| Total | 201 | 8.44 | 14.70 | 8.46 | 13.33 | 38.57 | 7.17 | 12.26 | 6.88 | 12.72 | 32.89 |
| | (100) | (3.08) | (4.55) | (2.57) | (3.59) | (19.19) | (2.67) | (4.35) | (2.69) | (3.63) | (19.17) |

*Note.* MAR = medically assisted reproduction treatments. Total score range was 4-16 for active-avoidance, 7-28 for active-confronting, 3-12 for passive-avoidance, 5-20 for meaning-based, and 12-84 for stress. $\eta^2$ of .01, .09, and .25 were considered small, medium and large, respectively.

[a] $df = 1,176$

[b] $df = 1,62$

[c] $df = 3,176$

*$p < .05$

*Supplemental Figure 1*. Simple APIM with direct individual and partner associations of infertility-specific support with infertility stress. Standardized path estimates are reported. Standard errors are in parentheses. Nonsignificant paths and within- and between-partner correlations are omitted from the figure for clarity.

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