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# Marital stability and repartnering: infertility-related stress trajectories of unsuccessful fertility treatment[1]

Running tittle: Marital stability and infertility stress

Mariana V. Martins, Ph.D.*[1], Patrício Costa, Ph.D.[1], Brennan D. Peterson, Ph.D.[2], Maria E. Costa, Ph.D.[1], Lone Schmidt, DMSci, Ph.D.[3]

[1] Faculty of Psychology and Education Sciences, University of Porto, Porto, R. Alfredo Allen, 4200-135 Porto, Portugal. Mariana V. Martins: mmartins@fpce.up.pt, Patrício Costa: pcosta@fpce.up.pt, Maria E. Costa: ecosta@fpce.up.pt.

[2] Faculty of Psychology, Crean College of Health and Behavioral Sciences, Chapman University, 1 University Drive, Orange, CA 92866, USA. bpeterson@chapman.edu

[3] Department of Public Health, University of Copenhagen, Øster Farimagsgade 5, P.O. Box 2099, 1014 Copenhagen K, Denmark. lone.schmidt@sund.ku.dk

* Correspondence concerning this article should be addressed to: Mariana V. Martins, Faculty of Psychology and Education Sciences, Porto University, R. Alfredo Allen, 4200-135 Porto, Portugal. E-mail: mmartins@fpce.up.pt

**Capsule:**

Subjects in fertility treatment who ended their relationships and repartnered had higher levels of infertility stress before and after the separation, compared with those who remained in the same relationship.

**Abstract**

**Objective:** To compare the trajectories of infertility-related stress between patients who remain in the same relationship and patients who repartner.

**Design:** Longitudinal cohort study using latent growth modeling.

**Setting:** Fertility centers in Denmark

**Patient(s):** Childless men and women evaluated before starting a new cycle of treatments, and followed for a 5-year period of unsuccessful treatments.

**Intervention(s):** None.

**Main Outcome Measure(s):** Marital stability and infertility-related stress.

**Result(s):** While the majority of patients (86%) remained with the initial partner, 14% of participants separated and repartnered while pursuing fertility treatments. Marital stability significantly predicted infertility stress initial status and infertility stress growth levels. Specifically, patients who repartnered had higher infertility stress levels at all time-points than those who remained in the same relationship, regardless of the partner they were with at assessment. Furthermore, results showed an increasing stress trajectory over time for those who repartnered, compared with those who remained in a stable relationship.

**Conclusion(s):** Men and women in fertility treatment who formed a second union had higher initial levels of stress while in their previous relationship and higher changes in stress levels over the course of treatments. These findings suggest that high infertility-related stress levels before entering fertility treatment can negatively affect the stability of marital relationships and lead to repartnering.

**Keywords:** infertility-related stress; marital stability; repartnering.

## Introduction

Divorce and repartnering through remarriage are common in Western countries. For example, in the United States, nearly half of first marriages end in marital breakdown within the first 15 years (1), and 75 percent of those who divorce will remarry within in less than four years (2). As it is well established that parenthood is a protective factor against separation or divorce (2, 3), it would be natural to conceptualize infertility as a risk factor to marital stability. However, the available evidence has produced mixed findings (4), Additionally, there are very few studies reporting the prevalence of marital breakdown after a diagnosis of infertility (e.g., 5, 6, 7). Furthermore, to the authors' knowledge, there are no studies focusing on repartnering in infertile individuals.

Infertility has been described as a threat to marital stability in developing countries (8, 9). In these nations, a woman's economic and social value is directly tied to her ability to conceive and give birth to children. Because of this, the psychosocial consequences of infertility such as divorce or abandonment of the wife and remarriage are common (10-12), and in some cultures, the concept of voluntary childlessness may not even exist (13). In developed countries, recent studies have showed that infertile couples who seek treatment have strong marital adjustment, and infertility can even strengthen their relationship (4, 14-16). However, there are also recent long-term investigations suggesting the opposite. Shanz et al. (7) found that men and women in fertility treatments maintained their initial levels in life satisfaction, but reported a decrease in partner satisfaction five years after beginning treatment. Surprisingly, 95% of these subjects had remained in the same relationship. In Sundby et al.'s study (17), 56% of women who had started fertility treatment 10 years before considered divorce, and 17% actually ended the relationship. Wirtberg et al. (18) conducted a qualitative study 20 years after unsuccessful tubal surgery among 14 women, and found that half the sample had separated, with nearly all women associating the marital breakdown with infertility.

Until now, nearly all longitudinal studies considering the psychosocial consequences of infertility have only included subjects who remain in stable relationships, and very few considered those who ended their unions and have repartnered (6, 17, 18). In addition, studies comparing patients who remain in the same marital relationship with those who repartner over the course of treatments are lacking. One of the unintended consequences of any infertility diagnosis is an increased awareness of the relationship between age and declining fertility (19). For couples who repartner and pursue fertility treatments, this issue is particularly salient, and these couples are commonly diagnosed with age-related infertility or preexisting infertility (20). Moreover, because engaging in treatment is likely to occur near the beginning of the new relationship, the stresses of an infertility diagnosis and subsequent treatments may pose a risk to the developing relationship

Because it is important to better understand the relationship between repartnering and infertility stress in couples undergoing fertility treatments, this study evaluates the association of infertility-related stress with marital breakdown and contrasts trajectories of patients remaining in stable relationships with trajectories of those who repartnered. We include five year post-treatment data and use latent growth modeling (LGM) to: a) identify the overall trend of the trajectory of infertility-related stress over time; and b) to examine the possible effect of repartnering on infertility-stress trajectories. This analysis allows us to verify if those who remained in the same relationship over the course of five years respond similarly to those who later repartnered, as well as to examine and compare the levels of initial infertility-stress in both groups before repartnering. The aim of the present research is to offer insight into the relationship between infertility-related stress, marital stability, and repartnering in couples who underwent unsuccessful fertility treatment over a five-year period.

## Materials and Methods

### Procedure

This study is a part of the Copenhagen Multi-center Psychosocial Infertility (COMPI) Research Program (21, 22), which includes the Infertility Cohort, comprising a consecutive sample of all new couples starting fertility treatment in one of five fertility clinics in Denmark initiated in 2000. Between January 2000 and August 2001, all new couples entering one of four large public hospital-based fertility clinics and one private clinic for the first time received a sealed, pre-addressed and stamped envelope immediately before their first treatment attempt (T1). Two follow-up questionnaires were sent 1 year (T2) and 5 years (T3) after delivery of T1 questionnaires. Participants who did not wish to participate returned an enclosed non-participating form, and a maximum of two-reminders at 10-day intervals was sent to those if the questionnaires or non-participating forms were not received.

The study followed the Declaration of Helsinki principles and was assessed by the Scientific Ethical Committee of Copenhagen and Frederiksberg Municipalities (01-107/99), who had no objections. Approval was given by the Danish Data Protection Agency (1999-1200-233).

**Sample**

In total, 2,812 fertility patients received a baseline questionnaire, and 2,250 (80.0%) responded. One year later, 2,206 participants received the 1-year follow-up questionnaire (44 were lost to follow-up: 38 whose identity was not registered at T1, 4 whose address could not be traced, 1 who had died and 1 who suffered a severe brain injury), and 1,934 (87.7%) responded. Five years later, 2,134 participants received the 5-year follow-up questionnaire (72 were lost to follow-up: 56 whose address could not be traced, 16 who had died or whose partner had died), and 1,481 (69.4%) responded.

This study was based in a subsample of the COMPI cohort who were childless (no childbirth after treatment or spontaneous conception, and no adoption) and experienced unsuccessful fertility treatment. In total, 1,401 participants delivered all the questionnaires. We further excluded those participants who: 1) already had a child together with their partners or from previous relationships before inclusion in

COMPI (n = 15); 2) had achieved parenthood during the follow-up periods, either with the same partner as T1 or with a new partner (n = 1,127); 3) left unanswered items of the outcome measure at two time points (n = 39). The final sample included 220 participants (135 women and 85 men). Since couples in Denmark are equally likely to be married or to cohabit without formal marriage, we did not distinguish between these two categories in our data analyses.

**Measures**

**The COMPI Fertility Problem Stress Scales** measures the amount of stress the fertility problem placed on daily life (e.g. "It is very stressful for me to deal with this fertility problem") with 14 self-report items (for a detailed description, see 23). Besides seven questions taken from The Fertility Problem Stress Inventory (24), seven additional items (e.g. "How much strain has the fertility problem placed on your relationship with pregnant women?") were added based on findings from The Psychosocial Infertility Interview Study (25). Items were rated on Likert-type scales, and summed up to produce total scores (range, 14-58). Higher scores indicated more stress. High internal consistency reliability estimates were found for this scale at baseline ($\alpha = .88$), 1-year ($\alpha = .89$), and 5-year follow-up ($\alpha = .90$).

**Data Analysis**

Descriptive statistics, correlations and t-tests were performed using PASW Statistics 18 (IBM-SPSS Inc). To investigate infertility-related stress growth and change trajectories, we estimated latent growth models (LGM) using AMOS (Amos Development Corporation). A maximum-likelihood estimator was used to estimate model parameters, and regression imputation was performed to replace missing values for 44 (20%) participants with one missing value on infertility stress scores. The main advantage of using LGM, comparing with repeated measures ANOVA, is that it examines both intra- and interindividual change over time while accounting for measurement error (26, 27). Applying LGM involves two steps and requires having the same continuous variable measured at three or more

occasions, with all participants responding at the same intervals, although the time between these intervals may vary (28). The first step refers to the unconditional model (figure 1, model A), in which we examined the change of infertility-related stress over time prior to the introduction of covariates. The second step, or conditional model, consists of incorporating covariates that are believed to predict change (model B). Besides marital stability, the conditional model included gender as a predictor due to the fact that women report higher levels of infertility-related stress than men (9, 29, 30). LGM allows for estimation of average scores and individual differences (variance) both at initial levels (intercept), and at change or growth levels (slope). While the factor loadings going from the intercept to each time period are fixed at 1 to define the starting point, loadings going from the slope are fixed over three time points (0, 1, and 5) to represent a linear growth over the study duration. The estimate of covariance reflects the degree of dependence between intercept and slope variables. Model fit statistics assess whether the assumptions represented by the models hold. We considered the criteria of chi-square ratio ($\chi^2$/d.f.) between 1 and 5 (31), root-mean-square error of approximation (RMSEA) $\leq .1$ (32), and confidence fit index (CFI) $\geq .95$ (33).

## Results

### Descriptive analyses

Preliminary analysis showed that infertility stress skewness and kurtosis values in every time point were less than .66 and .54, respectively, thus indicating approximately normal distributions (28). At baseline, participants had a mean age of 34.6 years (SD 5.5). All subjects were married or living together with a partner for 8.2 years (SD 4.1), and were attempting to have a child for 5.2 years (SD 2.8). Thirty-seven percent of the participants reported a diagnosis of infertility attributed to a female cause, 21% reported a male factor diagnosis, 10% reported a combined male-female causation, and 32% had unexplained infertility. At 5-year follow-up, 14% (n=31, 25 women and 6 men) of the participants

reported having separated and formed a second marital union, while the remainder 86% (n=189, 110 women and 79 men) were with the same partner. There are no separated or divorced subjects in this sample because at the time the investigation took place infertility treatment in Denmark was only legal for heterosexual couples.

Table 1 presents univariate descriptive statistics for the baseline, 1-year, and 5-year follow-up infertility stress levels. In general, it can be seen that infertility stress levels were higher at all time-points for those who separated comparing with those who remained in a relationship. Correlation and covariance matrices are shown in Table 2.

**Infertility stress trajectories**

The unconditional LGM (Figure 1, panel a) resulted in acceptable model fit: $\chi^2$ (3) = 9.68, P. <.05, RMSEA = .10 (90% confidence interval [CI] = .03-.18), CFI = .98. Results revealed a significant mean intercept factor ($\mu_i$ = 12.87, standardized estimate [SE] = .59, P<.001), and a significant variance in the intercept ($\sigma^2_i$ = 64.76, SE = 7.38, P<.001). This indicated that the average trajectory of infertility stress over 5 years began at 12.87, and that there existed significant differences across subjects in their starting values at the beginning of a new treatment. Results also revealed that the slope mean was statistically insignificant ($M_s$ = .19, SE = .10, P =.06), but there was a significant variance in the slope ($\sigma^2_s$ = .87, SE = .25, P<.001). Thus, while the overall increase in stress levels over time was not significant, there was evidence that there were individual differences in linear time changes as subjects continued fertility treatments. The covariance parameter was statistically insignificant ($\sigma_{i-s}$ = -.10, P =.91), indicating that the rate of change in infertility stress was not correlated with the initial infertility stress level.

To test whether repartnering would predict changes in stress, we ran a conditional LGM (figure 1, panel b). Findings indicated an improvement in model fit by adding the covariates repartnering and gender: $\chi^2$ (2) = 11.96, P. <.05, RMSEA = .085 (90% CI = .04-.14), CFI = .98. Results revealed that

marital stability was significantly related to the infertility stress initial status ($\beta = .224$, $P = .002$), reflecting that those who repartnered had higher initial levels of stress. Marital stability was also a significant predictor of the infertility stress growth levels ($\beta = .306$, $P = .004$), indicating that those who formed a second union had higher changes in infertility stress levels over the course of 5-years. Figure 2 illustrates these findings by plotting trajectories of stress for both groups, as well as for the overall sample. Gender was a significant predictor of infertility stress at the intercept, but not at the slope. Women had significantly higher initial levels of infertility stress than men ($\beta_{women.intercept}=.26$; $p < .001$), but the growth rate of infertility stress over the 5 years was similar to both women and men ($\beta_{women.slope}=.02$, n.s.). Effects of marital stability and gender together accounted for 11% of the proportion of variance in initial infertility-related stress. The effect of marital stability alone on changes in infertility stress accounted for 10% of its explained variance.

## Discussion

This study was conducted to determine the impact of marital dissolution and repartnering on infertility stress in men and women after five years of unsuccessful fertility treatments. More specifically, we asked whether men and women who separate during treatment have levels of infertility-related stress similar to men and women who remain in a relationship during treatment before separation occurs. We also asked whether the trajectories of infertility stress were similar for those who reported being in a new relationship and those who remained in the same relationship. To our knowledge this is the first study of its kind to address repartnering in the contexts of fertility treatment in developed countries using latent growth modeling and a longitudinal study design.

Five years after the initial assessment, 14% of participants in the sample ended their marital relationship and initiated a new one while continuing to pursue fertility treatment. The large majority of patients seeking treatment (86%) remained with the same partner. Even though there is no previous data

on remarriage within infertility, a recent prospective study on marital stability and divorce found that 95% of the participants had remained in marriage five years after the initial assessment (7). The difference in marital stability rates might be explained by the fact that the response rate of that study was around 40%, while the current study was near 70%. Additionally, over half of the patients in that sample had become parents over the course of the investigation, while the current sample was composed only of childless patients who continued to pursue treatment. There is well documented evidence showing that childless couples have a higher probability of divorce compared to couples who have children (particularly young children) (2, 3). This seems to remain true for couples who experience infertility as a recent survival study involving nearly fifty thousand Danish women found that childless women had approximately twice the probability of divorce than those who became mothers 5 years after the initial fertility evaluation (6). The bias of parenting (from current and/or previous relationships) was eliminated in this study by examining only trajectories of childless subjects.

Gender effects were also taken into account. As expected, women had significantly higher initial levels of infertility stress than men. Nonetheless, gender was not a significant predictor of infertility stress growth levels. Numerous studies from diverse cultures have found that women report higher levels of distress as a consequence of an infertility diagnosis compared to men (for a review, see 9). Our results suggest that although female stress levels are initially greater than male stress levels, they do not increase more rapidly than male stress levels. These findings might relate to research indicating that gender differences within infertility might be due more to gender alone and not directly related to the way this condition is experienced differently by both sexes, as evidenced by studies showing that infertile men and women have significantly lower levels of psychological adjustment compared with its same-sex counterpart in a group of presumably fertile subjects (34, 35).

Regardless of gender, marital stability predicted baseline levels of infertility-related stress for both men and women. That is to say, individuals who separated from their partners had higher levels of stress before separating than the ones who remained in the same initial marital union. One possible explanation for this is that a significant proportion of subjects already had marital difficulties before being diagnosed with infertility – a finding that has been supported by other health-related research. For example, Dorval (36) found that women who divorced after breast cancer had elevated marital distress prior to the cancer diagnosis. However, further research is needed to ascertain this hypothesis in the context of infertility. Although infertility has been compared to other diseases that can develop into chronic conditions in which uncertainty of the treatment outcome plays a central role, different relationship dynamics are involved. Specifically, in sharing a common desire for a child before the transition to a family, infertile couples are in the life-cycle stage associated with the highest levels of marital satisfaction (37).

Subjects who repartnered were also systematically more stressed and their stress levels significantly increased more rapidly over the years, while those who remained within the same relationship maintained their stress levels at follow-up. Hence, infertility-stress does not increase due to time per se, but because of other psychosocial variables like repartnering. The effect of repartnering on the infertility stress slope can be attributed in part to divorce. Even if desired, divorce is a stressful process with prejudicial consequences to psychological well-being (38, 39). These effects might be persistent in time, not only in terms of distress but also of social isolation and deficient coping strategies (40, 41). Therefore, the group of subjects examined in this sample could be experiencing multiple strains at the same time - infertility, divorce, reengaging in diagnostic procedures and new treatments with a new partner. There is evidence of high levels of stress hormones in divorcing couples, compared to happily married ones (42). Stress hormones can also affect time to pregnancy and infertility (43).

Hence, there is a probability of very low cost-effectiveness of treatment for this group of subjects who enter in new relationships and keep pursuing fertility treatment.

This study showed that it is possible to identify these subjects and offer couple counseling or therapy in time. Fertility counseling for couples can focus on coping skills training and partner support, which have been shown to have a significant influence on infertility-related stress to both couple members (14, 44). Infertility professionals should also be aware of the existence of remarriage situations within infertility. Remarried couples are more prone to divorce than first-married couples (2). If the couple seeks fertility treatment, it is likely that one member of the couple possesses knowledge and experience from previous treatments, while the other member of the couple is just beginning the treatment journey, and this discrepancy in partner history may negatively impact the relationship (20). This finding is corroborated by a previous study from Peterson et al. (45), showing that couples who report similar levels of stress present higher levels of marital adjustment than those who have incongruent stress levels. Furthermore, in this cohort of study participants, infertility-related levels of stress preceded the dissolution of the relationship, and not the other way around. Thus, it is recommendable to refer repartnered couples to counseling before treatment begins. This might be particularly relevant in situations where the female partner already has a child from a previous relationship, as couples where men show a greater need for parenthood have lower marital satisfaction than those who have a similar need (45). It seems essential for clinicians, especially mental health professionals, to be aware that high levels of stress in one member of a couple undergoing fertility treatments may increase the probability of separation.

Many other factors besides repartnering can contribute to high infertility stress and its growth. In fact, our model left almost 90% of the variability of infertility stress to be explained, suggesting the existence of other predictive mechanisms accounting for initial differences and changes in infertility

stress. Additionally, findings have to be interpreted with some significant caveats in mind. Because during the time this investigation took place fertility treatment was only allowed to married/cohabiting couples, subjects meeting the criteria for inclusion in this sample were either married/cohabiting or remarried/repartnered. Hence, even though almost 70% of the cohort responded to all three time-points, selection bias due to loss to follow-up could have occurred. Non-respondents at one and five year follow-ups may have divorced or re-partnered, as marital conflict can lead to dropout from treatment (46). The generalizability of findings is also limited by the population studied, i.e. Danish patients seeking fertility treatment. Results are neither generalizable to countries where fertility treatment is allowed to single subjects or same-sex couples, nor to countries where treatment is not allowed to cohabiting couples

In conclusion, findings from the current study provide support that men and women in fertility treatments who separate and repartner have elevated levels of infertility-related stress when compared to men and women who remain in the same relationship during treatment. In other words, individuals starting a new relationship over the course of five years had higher levels of infertility-related stress before repartnering, as well as higher levels of stress as fertility treatment continued. However, more research is needed to understand the incidence and importance of marital stability, divorce and repartnering within infertility. There is currently no evidence on how repartnered childless couples who continue infertility treatment without having a successful pregnancy cope with childlessness and marital conflict. Further studies should focus on the relationship between infertility-related stress and marital conflict, and on how to identify and counsel couples at risk of divorce before treatment. As low-quality marriages can more likely be removed from samples over time due to divorce (47), there is a potential selection bias in studies that have verified that stress does not affect the marital relationship and that infertility can bring couples closer (4, 16). Although additional studies are needed to control for this

bias, the findings from the current longitudinal study provide an important glimpse into an understudied area of the infertility research, and underscore the importance of the relationship between relational dissolution, repartnering, and infertility-related stress in men and women undergoing fertility treatments.

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## References

1. Bramlett MD, Mosher WD. Cohabitation, marriage, divorce, and remarriage in the United States. National Center for Health Statistics Vital Health Stat 2002;23:1-32.
2. Coleman M, Ganong L, Fine M. Reinvestigating remarriage: Another decade of progress. Journal of Marriage and Family 2000;62:1288-307.
3. Wehner C, Kambskard M, Abrahamson P. Demography of the Family. The Case of Denmark. In, 2004.
4. Schmidt L, Holstein B, Christensen U, Boivin J. Does infertility cause marital benefit?: An epidemiological study of 2250 women and men in fertility treatment. Patient education and counseling 2005;59:244-51.

5. Che Y, Cleland J. Infertility in Shanghai: prevalence, treatment seeking and impact. Journal of Obstetrics & Gynaecology 2002;22:643-8.
6. Kjaer T, Alberi V, Jensen A, Kjaer SK, Johansen C, Dalton SO. Divorce or end of cohabitation among Danish women evaluated for fertility problems. Acta Obstetricia et Gynecologica Scandinavica 2014.
7. Schanz S, Reimer T, Eichner M, Hautzinger M, Häfner H-M, Fierlbeck G. Long-term life and partnership satisfaction in infertile patients: a 5-year longitudinal study. Fertility and Sterility 2011;96:416-21.
8. de Kok BC. 'Automatically you become a polygamist': 'culture' and 'norms' as resources for normalization and managing accountability in talk about responses to infertility. Health: An Interdisciplinary Journal for the Social Study of Health, Illness & Medicine 2009;13:197-217.
9. Greil AL, Slauson-Blevins K, McQuillan J. The experience of infertility: a review of recent literature. Sociology of Health & Illness 2010;32:140-62.
10. Inhorn MC. Global infertility and the globalization of new reproductive technologies: illustrations from Egypt. Social science & medicine 2003;56:1837-51.
11. Ombelet W, Cooke I, Dyer S, Serour G, Devroey P. Infertility and the provision of infertility medical services in developing countries. Human reproduction update 2008;14:605-21.
12. Papreen N, Sharma A, Sabin K, Begum L, Ahsan SK, Baqui AH. Living with infertility: experiences among urban slum populations in Bangladesh. Reproductive health matters 2000;8:33-44.
13. Remennick L. Childless in the land of imperative motherhood: Stigma and coping among infertile Israeli women. Sex roles 2000;43:821-41.
14. Peterson B, Pirritano M, Christensen U, Schmidt L. The impact of partner coping in couples experiencing infertility. Human Reproduction 2008;23:1128-37.
15. Peterson BD, Pirritano M, Block JM, Schmidt L. Marital benefit and coping strategies in men and women undergoing unsuccessful fertility treatments over a 5-year period. Fertility and sterility 2011;95:1759-63. e1.
16. Sydsjö G, Ekholm K, Wadsby M, Kjellberg S, Sydsjö A. Relationships in couples after failed IVF treatment: a prospective follow-up study. Human Reproduction 2005;20:1952-7.
17. Sundby J, Schmidt L, Heldaas K, Bugge S, Tanbo T. Consequences of IVF among women: 10 years post-treatment. Journal of psychosomatic obstetrics and gynaecology 2007;28:115-20.
18. Wirtberg I, Möller A, Hogström L, Tronstad S-E, Lalos A. Life 20 years after unsuccessful infertility treatment. Human Reproduction 2007;22:598-604.
19. Everywoman J. Cassandra's prophecy: why we need to tell the women of the future about age-related fertility decline and 'delayed' childbearing. Reproductive BioMedicine Online 2013;27:4-10.
20. Hafkin N, Covington SN. The Remarried Family and Infertility. Infertility Counseling: A Comprehensive Handbook for Clinicians 2000:297.
21. Schmidt L. Infertility and assisted reproduction in Denmark: epidemiology and social consequences. Dannish Medical Bulletin 2006;53:390-417.
22. Schmidt L, Holstein BE, Boivin J, Sångren H, Tjørnhøj-Thomsen T, Blaabjerg J *et al.* Patients' attitudes to medical and psychosocial aspects of care in fertility clinics: findings from the Copenhagen Multi-centre Psychosocial Infertility (COMPI) Research Programme. Human Reproduction 2003;18:628-37.
23. Schmidt L, Holstein BE, Christensen U, Boivin J. Communication and coping as predictors of fertility problem stress: cohort study of 816 participants who did not achieve a delivery after 12 months of fertility treatment. Human Reproduction 2005;20:3248-56.

24. Abbey A, Andrews FM, Halman JL. Gender's role in responses to infertility. Psychology of Women Quarterly 1991;15:295-316.
25. Schmidt L. Psykosociale konsekvenser af infertilitet og behandling [Psychosocial consequences of infertility and treatment]. Copenhagen: FADL's Press, 1996.
26. Duncan TE, Duncan SC. The ABC's of LGM: An Introductory Guide to Latent Variable Growth Curve Modeling. Social and Personality Psychology Compass 2009;3:979-91.
27. Duncan TE, Duncan SC, Strycker LA. An introduction to latent variable growth curve modeling: concepts, issues, and applications. 2nd ed. Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers, 2006.
28. Kline RB. Principles and practices of structural equation modeling. New York: Guilford, 2005.
29. McQuillan J, Greil AL, White L, Jacob MC. Frustrated fertility: Infertility and psychological distress among women. Journal of Marriage and Family 2003;65:1007-18.
30. Peterson BD, Newton CR, Rosen KH, Skaggs GE. Gender differences in how men and women who are referred for IVF cope with infertility stress. Human Reproduction 2006;21:2443-9.
31. Schumaker RE, Lomax RG. A beginner's guide to structural equation modeling. Mahwah, N.J.: Lawrence Erlbaum, 1996.
32. Browne MW, Cudeck R. Alternative ways of assessing model fit. In: Bollen KA, Long JS, eds. Testing structural equation models. Newbury Park, CA: Sage, 1993:136-62.
33. Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. Structural Equation Modeling 1999;6:1-55.
34. Dyer SJ, Abrahams N, Hoffman M, van der Spuy ZM. `Men leave me as I cannot have children': women's experiences with involuntary childlessness. Human Reproduction 2002;17:1663-8.
35. Kedem P, Mikulincer M, Nathanson YE, Bartoov B. Psychological aspects of male infertility. British journal of medical psychology 1990;63:73-80.
36. Dorval M, Maunsell E, Taylor-Brown J, Kilpatrick M. Marital Stability After Breast Cancer. Journal of the National Cancer Institute 1999;91:54-9.
37. Lawrence E, Rothman AD, Cobb RJ, Rothman MT, Bradbury TN. Marital satisfaction across the transition to parenthood. Journal of Family Psychology 2008;22:41.
38. Hopper J. The Symbolic Origins of Conflict in Divorce. Journal of Marriage and Family 2001;63:430-45.
39. Waite LJ, Luo Y, Lewin AC. Marital happiness and marital stability: Consequences for psychological well-being. Social Science Research 2009;38:201-12.
40. Hetherington EM, Kelly J. For better or for worse: Divorce reconsidered: WW Norton & Company, 2003.
41. Johnson DR, Wu J. An empirical test of crisis, social selection, and role explanations of the relationship between marital disruption and psychological distress: A pooled time-series analysis of four-wave panel data. Journal of Marriage and Family 2002;64:211-24.
42. Shields CG, Finley MA, Chawla N. Couple and family interventions in health problems. Journal of marital and family therapy 2012;38:265-80.
43. Lynch C, Sundaram R, Maisog J, Sweeney A, Louis GB. Preconception stress increases the risk of infertility: results from a couple-based prospective cohort study—the LIFE study. Human Reproduction 2014;29:1067-75.
44. Martins M, Peterson B, Almeida V, Mesquita-Guimarães J, Costa M. Dyadic dynamics of perceived social support in couples facing infertility. Human Reproduction 2014;29:83-9.

45. Peterson BD, Newton CR, Rosen KH. Examining Congruence Between Partners' Perceived Infertility-Related Stress and Its Relationship to Marital Adjustment and Depression in Infertile Couples. Family process 2003;42:59-70.
46. Olivius C, Friden B, Borg G, Bergh C. Why do couples discontinue in vitro fertilization treatment? A cohort study. Fertility and sterility 2004;81:258-61.
47. Umberson D, Williams K, Powers DA, Liu H, Needham B. Stress in childhood and adulthood: Effects on marital quality over time. Journal of Marriage and Family 2005;67:1332-47.

Table 1. Descriptive statistics for infertility-related stress at three time points over 5 years.

| | Baseline | | 1-year | | 5-years | |
|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD |
| Marital stability (n =189) | 11.9 | 8.8 | 12.6 | 9.2 | 12.3 | 9.8 |
| Repartnered (n = 31) | 15.8 | 8.6 | 19.6 | 11.0 | 20.3 | 10.9 |
| Total (n = 220) | 12.5 | 8.8 | 13.6 | 9.8 | 13.2 | 10.2 |

Table 2: Correlation (below the diagonal), variance (diagonal) and covariance (above the diagonal) matrices for observed variables.

| Variable | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 1. Total distress Baseline | 76.9 | 65.8 | 59.5 | .50 |
| 2. Total distress 1-year follow-up | .777[a] | 93.3 | 73.1 | .89 |
| 3. Total distress 5-year follow-up | .670[a] | .747[a] | 102.6 | 1.10 |
| 4. Marital stability (0-Yes) | .163[b] | .266[a] | .310 [a] | .12 |

[a] P<.001.

[b] P<.05.

Figure 1: Schematic of latent growth model (LGM) analyses.

[a] Unconditional LGM for infertility stress.

[b] Conditional LGM for infertility stress with marital stability as predictor.

Figure 2: Predicted trajectories of infertility-related stress by marital condition.