Psychological interventions for economically disadvantaged families:

A systematic review and meta-analysis

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Abstract

Purpose: To examine the effects of psychological interventions on child and parent mental health outcomes for economically disadvantaged families. Method: Systematic review and meta-analytic procedures were used to synthesize the results of randomized controlled studies published between 1980 and 2018. Results: The search yielded 8 studies that included results for 1538 families in total. The risk of bias varied across studies. The meta-analysis results suggest a small positive effect ($g = 0.38$, $p < .001$) on child behavioral problems. Heterogeneity was relatively high and significant. We also found small to moderate effects on parenting stress, parental depression, and parenting quality (g ranging from .30 to .51). Discussion: The findings of this review suggest that psychological interventions for economically disadvantaged families are effective, with effect sizes that are comparable to those of interventions delivered to ordinary families. Implications for further research and practice are discussed.

Keywords: psychological intervention, mental health, economically disadvantaged families, meta-analysis

The mental health of individuals and families is greatly influenced by their social, economic, and physical contexts. Studies have consistently demonstrated certain inequalities between groups with differing socioeconomic status. Low income and economic disadvantage are associated with health risks and premature death for adults. Very often, children from these families experience lower levels of physical growth, and fewer resources, opportunities, and human capital due to their family incomes (Rank, 2004). For example, the prevalence of depressed mood in young people aged 8 to 12 was 1.8 times higher among those with a low socio-economic status when compared with their counterparts (Farrell, Sijbenga, & Barrett, 2009).

In a review of 115 studies, over 70% reported clear and positive associations between poverty and common mental disorders but income is often studied with other related variables such as education, food, housing, and socio-economic status (Lund et al., 2010). Another review found that 52 out of 55 published studies indicated an inverse relationship between socio-economic status and mental health problems in children and adolescents (Reiss, 2013). This relationship was found in all age groups and was already evident in early childhood. The odds ratios ranged from 1.18 to 3.34 and the prevalence rates for children from low socio-economic status groups ranged from 8.9% to 33.4%. Postnatal depression showed a social class gradient and over 20% of those in the lowest quintile for socio-economic status had experienced postnatal depression, compared with 7% in the highest socio-economic quintile (Marmot Review Team, 2010). A variety of models attempt to explain the negative impact of economic disadvantage on child outcomes. The resource investment perspective emphasizes the reduced time and money spent on child learning, health care, child care, and schooling (Becker, 1991), while the cultural perspective focuses on the differences in norms and behaviors transmitted from parents to

children (Lewis, 1975). The environmental stress perspective attributes the negative outcomes to noise, pollution, safety hazards, and substandard and overcrowding housing (Elder, 1974). Finally, a study from a family stress perspective identified a series of unfavorable family processes as a key mechanism of negative child outcomes (Magnuson & Votruba-Drzal, 2009).

The family stress model suggests that economic hardship will lead to child and family outcomes through adverse changes in marital quality and parenting styles (Conger & Elder, 1994; Masarik & Conger, 2017). The process begins with external financial pressures such as unemployment and low income, which lead to parental mental health problems such as increased parenting stress and parental depression, which in turn challenge marital quality and parenting practices. The consequent reduction in parenting quality yields negative family functioning and child mental health and behavioral problems (Conger, Conger, & Martin, 2010). The model has been considered as the most appropriate for studying the mediating contribution of parent psychological resources on children's risk of conduct problems (Shaw & Shelleby, 2014).

There have been calls to set the highest priority to ensuring a good start in life for children in families; family support services should be intergenerational and multidisciplinary, including health care, education, and social welfare services, to prevent and treat ill health equitably (Allen et al., 2014; Marmot et al., 2012). As some researchers have suggested that the impacts of exposure to stress can be buffered by mastery, self-esteem, and social support, other studies based on the family stress model further highlight some risks and protective factors that moderate the family stress process. Parental social support, effective coping strategies, a sense of optimism, effective problem solving, and neighborhood support have been identified as factors that can moderate the stress process (Masarik & Conger, 2017; Thoits, 2010). Based on these

insights, preventive programs can be developed to reduce the impact of family stress among economically disadvantaged families.

Purpose of the study

A review suggested that different psychotherapeutic approaches, including cognitive behavior therapy, social problem-solving approach, and multi-systemic therapy may benefit children and parents from disadvantaged families, given additional and adequate support services such as intensive outreach, childcare, and transportation (Santiago, Kaltman, & Miranda, 2013). However, a meta-analysis of 63 studies suggested that economic disadvantage moderates the effect of parent training, with both parents and children in economically disadvantaged families benefitting less than their counterparts (Lunhahl, Risser, & Lovejoy, 2006). However, for this specific target population, the outcomes of individually delivered parent training were significantly better than those of group training. In addition, the initial search of literature showed a variety of delivery mode and program intensity of psychological interventions. Therefore, a more systematic meta-analysis is needed to examine the current evidence for the mental health outcomes of psychological interventions for disadvantaged families, and the possible moderators of the intervention effects.

The questions that guided this study were as follows. (1) To what extent have psychological interventions for economically disadvantaged families provided positive mental health outcomes? (2) Are there any factors, e.g., mode of delivery and program intensity, that moderate these positive outcomes? We hypothesized that psychological intervention can effectively reduce child behavioral problem, parenting stress, parental depression, and improve parenting qualities of such families. We also hypothesized that for mode of delivery, parent–

child programs would have a larger effect size than parent only programs, and for program intensity, high-duration programs would have a larger effect size than short-duration programs.

Method

Systematic review and meta-analysis procedures were used for all aspects of the search, retrieval, selection, and coding of published and unpublished studies that met the study inclusion criteria. Meta-analysis procedures were used to quantitatively synthesize the findings of studies that met the criteria.

Study eligibility criteria

Systematic reviews are the reference standard for synthesizing evidence in health care, and evidence-based practice is becoming increasingly important to the social work profession. Based on pre-defined eligibility criteria and a methodological approach, a protocol of each systematic review was outlined (Moher et al., 2015). Study effects were calculated using meta-analytic methods. As a systematic review and meta-analysis did not involve human participants, ethical review was not necessary for this study. Eligibility criteria were:

Psychological interventions of parents' and children's mental health outcomes. English-language studies that assessed the effects of a psychological intervention on mental health outcomes for parents and children from economically disadvantaged families were eligible. Studies that aimed to promote only physical development, cognitive development, or learning were excluded.

Intervention types. Both preventive programs and interventions targeting specific clinical groups were included if all participants met the criteria of disadvantage. Psychological interventions were included if they were based on a certain psychotherapeutic approach such as

cognitive behavior therapy, mindfulness-based intervention, or parent-child interaction therapy, as were parent training and parenting involvement programs that combined psychoeducation with advice. To be included, the programs had to be developed with structured content and consistently implemented, which had to be indicated by describing the details of intervention content and implementation in the article or citing sources.

Randomized controlled trials (RCTs). We included randomized controlled trials only, and quasi-experimental designs were excluded.

Delivery modes. We also included programs with different delivery modes and both home-based interventions and center-based interventions were acceptable.

Program duration. Programs of any duration up to one year were included.

Economically disadvantaged families. Some studies used multiple criteria for participant recruitment and participants in the same study could be classified as "disadvantaged" families for different reasons. In this study, we considered studies that reported household income information and only included those studies in which at least half of the participants were below the poverty line. For those studies that met the other inclusion criteria but did not provide household income information, we wrote to the authors for clarification.

Outcomes of interest. A significant number of studies focused on the cognitive development and learning performance of children from disadvantaged families, whereas other studies targeted health outcomes. Studies without mental health outcome measures for both parents and children were excluded. The outcomes of interest in this review were parenting stress and parental depression, and child behavioral problems. As our study was guided by the family stress model, we also analyzed the outcomes in terms of changes in parenting quality.

Search strategy

A comprehensive search strategy was designed to identify eligible studies. We included selected electronic databases and research registries, with reference to previous reviews and included studies. For studies that were not available in the university library or on the internet, we contacted the researchers by email to request the study report or manuscript.

Databases. To identify peer-reviewed and grey literature, we searched seven databases: PsycINFO, PubMed, ERIC, Medline, Social Sciences Citation Index (SSCI), Sociological Abstracts, and Social Services Abstract. During the search, we also found and studied the systematic reviews and meta-analyses of parent and family-based interventions, and psychological interventions and identified studies that included family income or SES as a moderator of outcome (Leijten et al., 2013; Santiago, Kaltman, & Miranda, 2013). Based on the preliminary findings, our search included studies targeting children, parents, or families with "low socioeconomic status," "poverty," "low income," and "(economically) disadvantaged" backgrounds. The final search was conducted on March 19, 2019.

We also emailed seven authors to ask for clarification on their studies, especially on the number of participants who reported their household income as below the poverty line, as many studies did not include household income.

Data Extraction and Management

For all studies that passed the eligibility screening process described above, two reviewers independently coded each study using a structured data extraction form. The data extraction form, which was pilot tested by the reviewers, included items related to bibliographic information, the characteristics of participants and interventions, the research design and

procedures, and effect size data. Risk of bias was also independently assessed by two reviewers using Cochrane's risk of bias tool (Higgins et al., 2011). Following independent coding of the studies, the reviewers compared codes and identified and discussed discrepancies, which were resolved through consensus.

Statistical method

Several statistical procedures were conducted following the recommendations of Pigott (2012). First, a statistical analysis was performed to provide descriptive information on the characteristics of all included studies. Effect sizes were then calculated on the reported outcomes of each of the included studies. The standard mean difference effect size statistic, corrected for small sample size bias (Hedges's *g*), was calculated using the statistical software package Comprehensive Meta-Analysis, Version 3.0 (Borenstein, Hedges, Higgins, & Rothstein, 2014). Meta-analysis, assuming random effects models with inverse variance weights, was used to quantitatively synthesize the results across the included studies.

To examine whether between-study variability was greater than would be expected from sampling error alone, an analysis of heterogeneity was conducted. We calculated Cochrane's *Q* as well as I^2, which quantifies the amount of heterogeneity beyond sample differences (Higgins & Thompson, 2002). A moderate to large amount of heterogeneity, between 50% and 70%, is sufficient to conduct moderator analyses. We planned to conduct moderator analyses (such as study design, program intensity) where appropriate (Lipsey, Wilson, & David, 2001). We assessed and report publication bias; however, the use of funnel plots and other techniques such as regression to assess publication bias with fewer than 10 studies is not indicated (Card, 2012).

Results

A total of 956 records were found in the seven selected electronic databases. After reviewing the titles and abstracts, the full texts of 72 articles were retrieved for further examination; 64 of them were excluded, so the final sample for this review included 8 studies (see Figure 1 for a flow diagram of the search and selection process, and Table 1 for a summary of included studies).

Characteristics of Included Studies

Study characteristics. Table 2 provides a summary of the characteristics of the included studies. Although we searched from 1980, all of the studies were published within the last 20 years, with four between 2000 and 2009 and four between 2010 and 2019. All eight studies used a randomized study design, including one that used a cluster randomized controlled trial instead of randomization of individual participants. Seven of the studies used a wait-list control group, and one used a no-intervention control group. Sample sizes ranged from 26 to 731 participants. All eight studies were published in peer-reviewed journals. The studies included in the meta-analysis were conducted in different regions: three in North America, four in Europe, and one in Asia.

Participant characteristics. A total of 1538 parents with a mean age of 34.2 participated in the included studies. Three studies did not report the gender proportion of participants, and in the other three studies 94.3% (n = 233) were mothers. The age of the target children ranged from 1 to 7 years old.

Intervention characteristics. A variety of psychological interventions were used across the eight studies (see Table 1). All of the studies used a treatment manual: one study (Dishion et al., 2008) used a family intervention, the Family Check-Up (Dishion & Stormshak, 2007); one used a new family-based mindfulness intervention for both parents and children developed by the

study authors (Lo et al., 2018); four studies (Gross et al., 2003; Hutchings et al., 2007; Hutchings et al., 2017; McGilloway et al., 2012) were based on the Incredible Years Parent Program (Webster-Stratton, 1987); one was based on a peer-led parenting program, Empowering Parents, Empowering Communities (Day et al., 2012), and the last one (Nicholson, 2002) used the STAR Parenting Program (Fox & Fox, 1992). The duration of treatment varied from 3 to 30 hours. One of the interventions was home-based, and the other seven were delivered in a group treatment format. Seven of the interventions were provided for parents only, and one involved both parents and children.

Risk of Bias

Risk of bias was assessed by two reviewers using Cochrane's risk of bias tool (Higgins et al., 2011; Higgins & Green, 2011). Selection bias was rated as uncertain in two studies (Gross et al, 2003; Nicholson, 2002) that did not clearly report the randomization and blinding procedures, and as low risk in the remaining six studies. Selection bias was rated as uncertain in three studies (Day et al., 2012; Gross et al. 2003: Nicholson, 2002) that did not report their method of allocation concealment. In terms of performance bias, seven studies used a waitlist control group design and it was impossible to blind the whole research team to the randomization and allocation. This may result in overestimation of the intervention effect (Cunningham, Kypri, & McCambridge, 2013). In one study that used no intervention as the control, participants were blinded and the study was rated as low risk (Dishion et al., 2008). Detection bias was rated as high in all studies, as child outcome measures were rated by parents and thus confounded by parents' mental health, while parents' mental health was assessed by self-report measures. Attrition bias was considered low in seven studies and unclear in the eighth due to very limited information about attrition (Nicholson et al., 2002). Reporting bias was considered low in all

studies. In terms of other bias, seven studies were rated as uncertain because these studies included participants with household income above the poverty line and therefore the outcome of the study may be bias. The study in which all participants reported having an income below the poverty line was rated as low risk (Lo et al., in press).

Effects of Interventions

A meta-analysis was conducted for each of the four outcomes (child behavioral problems, parenting stress, parental depression, and parenting quality) included in this review based on the 8 psychological intervention studies that met the criteria for inclusion.

Child behavioral problems. Mean effect sizes and confidence intervals (CIs) for the 8 studies that measured child behavioral problems are shown in Figure 2. The measures included Child Behavior Checklist Total Problem (CBCL; Achenbach & Rescorla, 2000), CBCL Externalizing Problem (Achenbach & Rescorla, 2000), Eyberg Child Behavior Inventory Intensity Score (ECBI; Robinson, Eyberg & Ross, 1980), Parenting Stress Index–Short Form Difficult Child (PSI; Abidin, 1995). The results indicate a positive, mild, and significant treatment effect (g = 0.38, 95% CI = [0.27, 0.49], $p < .001$). Heterogeneity was relatively high ($I^2 = 50.90$) and significant ($Q = 14.26$, $p = 0.047$).

Parenting stress. Mean effect sizes and confidence intervals (CIs) for the 7 studies that measured parenting stress are shown in Figure 3. The measures included PSI Total Stress (Abidin, 1995) and Everyday Stress Index (ESI; Hall & Farel, 1988). The results indicate a positive, mild (but very close to moderate), significant intervention effect ($g = 0.46$, 95% CI = [0.30, 0.62], $p < .001$). Heterogeneity was low ($I^2 = 0.00$) and insignificant ($Q = 3.10$, $p = 0.80$).

Parental depression. Mean effect sizes and confidence intervals (CIs) for the 6 studies that measured parental depression are shown in Figure 4. The measures included Center for Epidemiological Studies on Depression Scale (CES–D; Radloff, 1977), Beck Depression Inventory (BDI; Beck et al., 1961), and Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer, & Williams, 2001). The results indicate a positive, mild, and significant intervention effect (g = 0.30, 95% CI = [0.19, 0.42], $p < .001$). Heterogeneity was low ($I^2 = 0.00$) and statistically insignificant ($Q = 4.50$, $p = 0.48$).

Parenting quality. Mean effect sizes and confidence intervals (CIs) for the 7 studies that measured parenting quality are shown in Figure 5. The measures included Dyadic Parent–Child Interactive Coding System—Revised Positive Parenting (DPICS–R; Webster-Stratton, 1998), Parenting scale (PS; Arnold et al., 1993), Interpersonal Mindfulness in Parenting Total Score (IM-P; Duncan, 2007), and Parent Behavior Checklist Nurturing Score (PBC; Fox, 1994). The results indicate a positive, mild, and significant intervention effect ($g = 0.51$, 95% CI = [0.36, 0.66], $p < .001$). Heterogeneity was low ($I^2 = 0.00$) and statistically insignificant ($Q = 2.69$, $p = 0.85$).

Subgroup Analysis

In view of the high heterogeneity in the child behavioral problem outcomes and the low heterogeneity in all three parental outcomes, we conducted subgroup analyses for the child outcome only. Two subgroup comparisons for child behavioral problem outcomes were conducted to test for differences in the effect sizes between parent-only and parent-child interventions, and between low-intensity (≤ 20 hours) and high-intensity (> 20 hours) interventions.

Parent-only vs. parent-child intervention. Due to the small sample size, we did not find a significant difference between the effect sizes of the parent-only and parent-child interventions ($Q = 0.05$, $p = 0.83$). Mean effect sizes and confidence intervals (CIs) for the measurement of child behavioral problems in the 7 studies of parent-only interventions and the only one parent-child intervention are shown in Figure 6. The results indicate a positive, small, and significant treatment effect for the parent-only interventions ($g = 0.38$, 95% CI = [0.26, 0.49], $p < .001$). Heterogeneity was relatively high ($I^2 = 57.21$) and statistically significant ($Q = 14.02$, $p = 0.03$). The results indicate a positive, moderate, and statistically significant treatment effect for the parent-child intervention ($g = 0.50$, 95% CI = [0.01, 0.99], $p < .05$). Because there was only one intervention in this category, heterogeneity was zero ($I^2 = 0.00$) and not significant ($Q = 0.00$, $p = 1.00$).

Low-intensity vs. high-intensity intervention. The mean of hours of selected studies was used as cutoff. We did not a find a significant difference between the effect sizes of low-intensity and high-intensity interventions ($Q = 1.62$, $p = 0.20$) due to the small sample sizes and the heterogeneity among studies. The intervention effects on child behavioral problem outcomes were heterogeneous in high-intensity but not in low-intensity interventions. The mean effect sizes and CIs for the measures of child behavioral problems in the 4 low-intensity and 4 high-intensity interventions are shown in Figure 7. The results indicate a positive, small, and significant treatment effect for low-intensity interventions ($g = 0.30$, 95% CI = [0.16, 0.43], $p < .01$). Heterogeneity was low ($I^2 = 0.00$) and insignificant (Q = 1.77, p = 0.62). The results indicate a positive, moderate, and significant treatment effect for high-intensity interventions ($g = 0.54$, 95% CI = [0.34, 0.75], $p < .001$). Heterogeneity was high ($I^2 = 75.40$) and significant ($Q = 8.13$, $p = 0.02$).

Discussion and Applications to Practice

Overall, we found some evidence for the positive effect of the psychological interventions on child and parent mental health and parenting quality, and small to moderate effect sizes (*g* ranged from .30 to .51) were found for the four outcomes of our study. In this meta-analysis, we only included studies with a randomized controlled design and rigorous methodology. Some previous reviews have concluded that economic disadvantage reduces the intervention effect (Lundahl, Risser, & Lovejoy, 2006; Leijten, Raaijmakers, Castro, & Matthys, 2013). A meta-analysis of the Incredible Years program, which four of our eight studies were based on, reported that the effect size of the parenting program varied from mild to moderate, based on the nature of selective prevention, indicated prevention, and treatment program (*d* ranged from .13 to .50) (Menting, Castro, & Matthys, 2013). The results of our meta-analysis suggest that the effect sizes of these intervention programs for disadvantaged families are comparable.

The effect size for child behavioral problems in our study was small ($g = .38$), but with high heterogeneity; the effect size ranged from .17 to .88 across the 8 studies. It should be noted that four of the studies which reported moderate to high effect sizes ($g = .50$ or above) could be classified as treatment studies. The two studies with the highest effect sizes (Hutchings et al., 2007; McGilloway et al., 2012) used a clinical cut-off score for child behavioral problems as the inclusion criteria. Thus, their larger effect sizes may be attributable to the higher intensity of pretreatment problems. This also implies that properly organized psychological interventions can be effective in reducing child behavioral problems in economically disadvantaged families.

We examined two parent mental health outcomes, parenting stress and parent depression. The effect sizes for parenting stress in our study were small, but very close to moderate (g = .46) and the heterogeneity was very low (range of g from .31 to .58). Two studies with larger effect sizes also had larger effect sizes for child behavior problems. We found some evidence that psychological interventions are effective in reducing parenting stress. For parental depression, the mean effect size across 5 studies was .30 (*g* ranged from .01 to 0.53). It should be noted that most of the programs in our study were parenting programs that were not developed specifically for reducing parental depression. However, the study with largest effect size for depression (*g* = .53; Lo et al., in press) was a mindfulness-based intervention program, and there is strong evidence that this type of approach is effective in promoting emotional regulation and has clear benefits for people with major depression (Roemer, Williston & Rollins, 2015). Although we cannot state whether the differences in effect size could have been due to differences in the intervention approaches, a further study could explore whether there is a moderating effect of the type of intervention for families with multiple disadvantages, such as economic disadvantages and mental health challenges.

We found a moderate effect size for parenting quality (g = .51) across 7 studies. The range of effect sizes was .35 to .78 and the heterogeneity was very low. This study offers some evidence that psychological intervention can improve parenting quality in economically disadvantaged families. It is interesting to notice that a study applied mindfulness-based intervention contained no parenting education component but produced comparable improvements in parenting quality. It suggests that parental mental health, parenting style, and child mental health are interrelated and improving one of these aspects is likely to produce positive effects on the others, as suggested by family stress theory.

The risk of bias was assessed and discussed. It should be highlighted that the performance bias was uncertain due to the use of a waitlist control design in parenting and disadvantaged family studies, probably due to the ethical concern that no parents and families should be excluded from receiving such a program. The use of an active control group should be promoted for future studies. Detection bias was high across all studies as the measures were mostly based on parents' self-report, and child outcomes may have been confounded by parental mental health outcomes. Innovative study designs such as the use of biomarkers and behavioral observations may help to overcome these obstacles and strengthen the evidence in this important area of social work and public health research.

In view of the significant proportion of economically disadvantaged families in the whole population, researchers, practitioners and policy makers should make good use of the potential impact of psychological interventions and generate multiple strategies for eradicating social inequalities in mental health. Further outcome studies of interventions for economically disadvantaged families will improve the design of such interventions so that families in need can benefit more from cost-effective, properly implemented programs.

The two subgroup analyses provide more insights into the studies in this area. We found no significant differences in the effect sizes between parent only and parent–child programs, or between low-intensity and high-intensity programs. Although this suggests that it may be more cost-effective to organize low-intensity parent-only programs, there is still insufficient evidence to reach this conclusion. Furthermore, a comparison between effect sizes in terms of program intensity should include long-term follow-up data. Unfortunately, in this meta-analysis we decided not to include follow-up outcomes as the follow-up period across studies varied, making it difficult to conduct a meaningful analysis in this area. More recent studies have included cost

analyses (e.g., McGilloway et al., 2014), and further studies should include outcomes such as the use of health and social care to evaluate the cost-effectiveness of such programs for economically disadvantaged families.

We identified a few limitations that the findings of the study must be interpreted mindfully. First, all eight selected studies in our meta-analysis were conducted in developed countries. Although we identified a few studies that were conducted in developing countries in the search process, their study designs were not explained clearly and their programs were likely to have been less structured due to various contextual factors. Therefore, the findings of this study cannot be generalized to developing countries. Second, in contrast to many meta-analyses that have reported low heterogeneity across studies, our selected studies reported high heterogeneity in child outcomes. We attempted to conduct subgroup analyses and identified possible moderators in these studies. Unfortunately, our sample size was small and another meta-analysis will need to be conducted in the future so that the evidence can be verified.

Third, all selected studies were based on parents and young children. We could not identify any studies that targeted adolescents from economically disadvantaged families that met the inclusion criteria of this study. Therefore, the findings of this study can only be generalized to families with children in this particular age group. Finally, although we conducted a comprehensive search, including a search for gray literature, all of the selected studies were published in peer-reviewed journals. It is unclear whether there is a publication bias that could present a threat to the validity of this review. Despite these limitations, the present study provides the first systematic synthesis of psychological interventions for improving mental health outcomes in economically disadvantaged families. Hopefully the findings will provide some insights into inequalities in mental health that can be used to inform future research.

Our findings provide preliminary evidence for the use of parenting or family-based approaches to improve the mental health of children and parents from economically disadvantaged families. The current evidence base is small and the methodological limitations have been recognized; therefore, more rigorous research in this area is required. Evidence-based programs should be promoted so that more underprivileged families can benefit from healthy family practices and mental health inequalities can be reduced.

Declaration of Conflicting Interests

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