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ORIGINAL PAPER

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Global and relationship-specific perceptions of support and the development of postpartum depressive symptomatology

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Abstract *Background* A lack of social support has consistently been demonstrated to be an important modifiable risk factor for postpartum depression. As such, a greater understanding of specific support variables may assist health professionals in the development of effective preventive interventions. The purpose of this paper was two-fold: (1) to determine if women discriminated between global and relationship-specific perceptions of support, and (2) to examine the influence of global and relationship-specific perceptions of support in the immediate postpartum period on the development of depressive symptomatology at 8 weeks postpartum. *Methods* As part of a longitudinal study, a diverse sample of 594 mothers completed questionnaires that included the Edinburgh Postnatal Depression Scale (EPDS) and global and relationship-specific (e.g., partner, mother, and other women with children) measures of support. *Results* Mothers clearly discriminated between global and relationship-specific perceptions of support and those with depressive symptomatology at 8 weeks had significantly lower perceptions of both global and relationship-specific support at 1-week postpartum. Using discriminant function analysis, four variables, reliable reliance from partner, nurturance from partner, attachment to other women with children, and EPDS score at 1-week postpartum, differentiated between mothers who experienced depressive symptomatology at 8 weeks and those who did not. *Conclusion* Relationship-specific interventions may be beneficial if they include strategies that target a positive partner relationship through preceptions of reliable alliance and feeling needed and provide opportunites for interaction with other mothers. Maternal mood at 1 week postpartum was the largest predictor of depressive symptomatology at 8 weeks.

Key words postpartum depression – global support – social support – discriminant function analysis

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Introduction

In many industrialized countries, postpartum depression has become the most common complication following childbirth. Measured by self-report scales and diagnostic clinical interviews, this well documented affective condition has a pooled prevalence rate of 13% within the first 12 weeks postpartum [43]. The cause of postpartum depression remains unclear [8], with extensive research suggesting a multi-factorial etiology. However, epidemiological studies and meta-analyses of predictive studies have consistently implied the importance of social support [1, 43]. Analyses of social support variables in predictive studies suggest the following social deficiencies significantly increase the risk of postpartum depression: (a) not having someone to talk openly with who has shared and understood a similar problem [2], (b) lacking an intimate confidant or friend to converse with [2, 44, 46, 51], (c) not receiving support without having to ask for it [2], and (d) feeling socially isolated [34].

In addition to these general perceptions of support, women who report marital difficulties have been found to be at risk of developing postpartum depression [1, 31]. Depressed mothers are more likely to (a) be dissatisfied with the support received from their partners [52], (b) feel communication is poor

[46], (c) perceive their partner as uncaring [4], (d) report a decline in the affection and cohesion in their relationship [17], and (e) find a discrepancy between their expectations and later experiences of closeness to their partner [5, 26, 27]. Researchers have also examined the importance of support from women's mothers [6, 39, 54] and other women with children [30, 32, 33, 56, 57]. Unfortunately, limited research has been conducted to explain which specific aspects of supportive relationships have a protective effect in the development of postpartum depression and most studies examining the influence of relationship-specific support have suffered from an atheoretical perspective.

The importance of social relationships in the treatment of disease and the maintenance of health has drawn the attention of scientists across a large number of disciplines. Prospective studies have established associations between measures of interpersonal relationships and mortality, psychological and physical morbidity and adjustments to and recovery from acute and chronic stressors [7]. Interventions designed to alter the social environment have been successful in facilitating psychological adjustment, aiding recovery from traumatic experiences, promoting positive health behaviors, and even extending life for individuals with serious chronic disease [7]. Traditionally, this work has focused on global perceptions of support, where participants are asked to describe particular features of their overall social networks such as its size, or to estimate the degree to which the network provides various types of assistance and support. However, there has been an increased interest in assessing the support provided by particular relationships and in examining the association between these more specific measures and indicators of psychological well-being.

According to current research, global perceptions of support may represent a stable view held by an individual about the general positivity or negativity of the social world [13]. This perception reflects the individual's overall feeling of acceptance by others and belief that others will generally be helpful in times of difficulty. Based on this view, global perceptions function as a stable personality characteristic rooted in early childhood relationships. In contrast, relationship-specific perceptions of support are thought to be more tightly linked to one's accumulated history of experience with particular individuals and are less reflective of a general outlook on social life [13]. These relationship-specific expectations are not simply components in a larger schema of global perceptions of available support. Although a person's global and relationship-specific expectations for social support may be related, they may also reflect different aspects of perceived support and play an important and unique role in the development of psychological problems, including postpartum depression. It is unknown whether interventions that target maternal global perceptions of support are more beneficial in preventing postpartum depression than those that target relationship-specific perceptions of support. The purpose of this paper was two-fold: (1) to determine whether women discriminated between global and relationship-specific perceptions of support and (2) to examine the influence of global and relationship-specific perceptions of support in the immediate postpartum period on the development of depressive symptomatology at 8 weeks postpartum.

Method

Participants

Participants completed diverse questionnaires as part of a longitudinal study conducted in a health region near Vancouver, British Columbia, Canada from April 2001 to January 2002 to develop a multi-factorial predictive model of postpartum depression [15]. Eligible women, who were at least 18 years of age and able to understand English, were recruited after receiving approval from the university ethics committee and study authorization from the participating health region. To recruit a population-based sample, antenatal consent packages were available through participating family physician, obstetrician, and midwifery offices for mothers at more than 32 weeks gestation to complete; a public health nurse retrieved completed packages every 1–2 weeks. Postnatal recruitment entailed public health nurses providing study explanation during the standard 48-h post-hospital discharge call offered to all new mothers. All participants recruited were mailed the same questionnaires at 1 and 8 weeks postpartum, which included researcher-addressed, stamped return envelopes. Reminder telephone calls were provided to women who did not return their questionnaires within 2 weeks of mailing.

Measures

The Edinburgh Postnatal Depression Scale (EPDS) [9], a 10-item self-report instrument, was used to assess depressive symptomatology. Items were rated on a 4-point scale to produce a summative score ranging from 0 to 30, with higher scores indicating lower maternal mood. This instrument does not yield a diagnosis of postpartum depression but rather it is the most frequently used instrument to assess postpartum depressive symptomatology and identify at-risk mothers. Created to counter the limitations of other well-established depression scales, the EPDS has well documented reliability and validity in multiple languages. Using a cut-off point of 12/13 at 6 weeks postpartum, the EPDS has a sensitivity of 68%–95%, and a specificity ranging from 78% to 96% when compared to a diagnosis of postpartum depression established through a psychiatric interview [9, 18, 40].

The Social Provisions Scale (SPS) [12], a 24-item self-report instrument, was used to assess global perceptions of support at 1-week postpartum. Based on the theoretical work by Weiss [58], six different social functions or "provisions" are obtained from relationships and are needed for individuals to feel adequately supported, although different provisions may be more crucial in certain circumstances or at different stages of the life cycle. This scale includes the theorized six provisions (4 items per provision) and are as follows: *guidance* (advice or information), *reliable alliance* (the assurance that other can be counted upon for tangible assistance), *reassurance of worth* (recognition of one's competence, skills, and value by others), *attachment* (emotional closeness from which one derives a sense of security), *social integration* (a sense of belonging to a group that shares similar interests, concerns, and recreational activities), and *opportunity for nurturance* (the sense that others rely upon them for their well-being). Items were rated

on a 4-point scale to produce a summative score ranging from 24 to 96, with higher scores indicating higher levels of global support. Separate scores were derived for each of the six provision subscales ranging from 4 to 16. This measure has been used with postpartum women [10, 11] and has well-established reliability and validity, including factor structure [12].

The Social Provisions Checklist (SPC) [13], a 30-item self-report instrument, was used to assess relationship-specific perceptions of support at 1-week postpartum. Also based on the theoretical work by Weiss [58], this scale contains the same six provisions (5 items per provision). Participants were asked to respond to all 30 items three times, each time with reference to the following relationships: partner, mother, and other women with children. Items were rated on a 5-point scale to produce a summative score for each relationship ranging from 30 to 120, with higher scores indicating higher levels of support. As with the SPS measure of global support, separate relationship-specific scores were derived for each of the six provisions ranging from 5 to 20. While this measure has not been used with postpartum women before, it does have established reliability and validity in an adult population [13].

Statistical analysis

Means, frequencies, and percentages were calculated for descriptive data. Pearson χ^2 analyses were used to examine associations between categorical data while one-way analysis of variance was used to determine differences between ordinal variables. Continuous variables were examined through independent two-sample *t*-tests. Cronbach's α coefficients were calculated for each global and relationship-specific domain and principal components factor analysis with orthogonal rotation was conducted to examine the discrimination among global and relationship-specific measures. Multiple regression was performed to examine the impact of relationship-specific support on global support and significant variables were retained in the model if the *P*-value for the beta-estimate was 0.05. Discriminant functional analysis was used to predict maternal group membership at 8 weeks as either depressed (EPDS score > 12) or non-depressed (EPDS score ≤ 12) based on the recommended EPDS cut-off score of 12/13 to determine depressive symptomatology [9]. All data analysis was performed using SPSS and a two-tailed significance level of 0.05. The formula presented by Tabachnick and Fidell [55] was used to calculate a proposed sample size. With a Type I error of 0.05 and a Type II error of 0.20, the sample size (*N*) needed to evaluate independent predictors (*m*) for the multivariate analysis was: $N = 50 + 8\,m$. In this study with 25 potential independent predictors, a minimum sample size needed was 304.

Results

Sample

One hundred and sixty-four participants were recruited antenatally. Of the approximately 971 women screened postnatally, 857 were eligible; the most common reason for ineligibility was inability to read English ($n = 27$, or 24% of those ineligible). Of the eligible women, 190 (22%) declined enrolment, most frequently citing stress/too busy ($n = 61$, 32%) or lack of interest ($n = 59$, 31%). Of the remaining postnatal mothers, 667 agreed to participate. In total, 594 participants returned the 1-week postpartum questionnaire (a 71% response rate) with 498 (84%) also returning the 8-week questionnaire.

The mean age of this sample was 28.5 years (±5.0), ranging from 18 to 44 years. Ninety-one percent of the women were Caucasian ($n = 540$) with 90% indicating they were married or living common-law ($n = 533$). Thirty-nine percent ($n = 231$) of mothers had a high school diploma or less, 38% ($n = 228$) had a college diploma, and 21% ($n = 126$) had a university degree or higher. In relation to annual household income, 40% ($n = 216$) of women had an income less than $24,000 U.S., 26% ($n = 143$) had incomes between $24,000 and $37,000, and 34% ($n = 187$) had incomes greater than $37,000. Forty-four percent ($n = 262$) of women were primiparous, 74% ($n = 440$) delivered vaginally, and 69% ($n = 408$) were discharged home within 48 h of delivery; maternal and infant 1-month hospital re-admission rates were 1.9% ($n = 10$) and 4.3% ($n = 23$) respectively. No baseline differences existed between those recruited antenatally and postnatally and those who completed the 8-week questionnaire and mothers who did not.

Table 1 Means, standard deviations, and Cronbach's αs for global and relationship-specific variables

Domain	Provision	*M*	SD	α
Global	Total global	82.81	8.85	0.90
	Attachment	14.05	2.03	0.70
	Social integration	13.49	2.04	0.78
	Opportunity for nurturance	12.55	2.36	0.72
	Reassurance of worth	13.41	1.97	0.74
	Reliable alliance	14.81	1.64	0.67
	Guidance	14.49	1.90	0.79
Partner	Total partner	126.77	19.07	0.91
	Attachment	21.59	3.69	0.90
	Social integration	21.31	3.44	0.89
	Opportunity for nurturance	20.18	3.37	0.81
	Reassurance of worth	20.90	3.88	0.84
	Reliable alliance	22.29	3.14	0.88
	Guidance	20.51	3.63	0.85
Mother	Total mother	113.39	23.82	0.87
	Attachment	19.49	4.46	0.78
	Social integration	18.26	4.32	0.88
	Opportunity for nurturance	17.17	4.21	0.74
	Reassurance of worth	19.58	4.54	0.81
	Reliable alliance	19.62	4.38	0.83
	Guidance	19.26	4.65	0.79
Women with children	Total women	109.57	19.54	0.91
	Attachment	17.78	3.84	0.88
	Social integration	19.83	3.39	0.84
	Opportunity for nurturance	17.29	3.72	0.81
	Reassurance of worth	18.95	3.65	0.87
	Reliable alliance	16.84	3.55	0.83
	Guidance	18.79	3.58	0.81

Objective 1: discrimination between global and relationship-specific support measures

Table 1 displays the mean, standard deviation, and internal reliability for all of the support variables. While intercorrelations of the six provisions within any global and relationship-specific domain were very high (mean r for within-domain correlations = 0.81), correlations across domains were markedly smaller

Table 2 Correlations between total scores on global and relationship-specific subscales

	Global	Partner	Mother	Women with children
Global	–	0.47	0.31	0.47
Partner	–	–	0.21	0.26
Mother	–	–	–	0.27

Note. All correlations are significant at the 0.01 level (2-tailed)

(Table 2). These correlations and intercorrelations suggest a strong relationship exists within each specific provision subscale and that women make clear distinctions between global and relationship-specific domains.

To further examine the discrimination among global and relationship-specific measures, principal components factor analysis with orthogonal rotation was conducted. Four factors with eigenvalues greater than 1.0 emerged, accounting for 53% of the variance. Each factor clearly reflected one of the four domains: global, partner, mother, and women with other children. Corresponding eigenvalues for each domain were 8.35, 17.55, 17.79, and 17. The highest loadings for each factor were the six provisions subscales associated with the specific domain. All loadings were greater than 0.50 and no provision subscale loaded on another factor higher than 0.30. Evidence from both these analyses corroborates the discriminability of the global and relationship-specific measures of support.

Relationship between global and relationship-specific support measures

To directly examine the relationship between global perceptions of support and relationship-specific support, a standard multiple regression was performed. In this analysis, relationship-specific provision subscales for all three domains (partner, mother, and women with children) were entered simultaneously. A moderate proportion of the variation in global support was accounted for by the relationship-specific measures ($R^2 = 0.37$). Four variables were statistically influential of global perceptions of support: attachment to partner ($\beta = 0.23$, $P = 0.004$), reassurance of worth from mother ($\beta = 0.22$, $P = 0.01$), attachment to other women with children ($\beta = 0.25$, $P = 0.007$), and social integration with other women with children ($\beta = 0.19$, $P = 0.01$).

Objective 2: predicting depressive symptomatology

Based on EPDS scores at 8 weeks, participants were classified into one of two groups: depressive symptomatology (EPDS > 12) and non-depressive symptomatology (EPDS ≤ 12). The prevalence of depressive symptomatology at 8 weeks was 8% ($n = 38$); the overall sample mean EPDS score was 5.5 (±4.5). There were no significant demographic differences between the two groups in relation to maternal age ($t = 1.17$, $P = 0.25$), marital status ($\chi^2 = 0.24$, $P = 0.62$), education ($F = 0.09$, $P = 0.76$), parity ($\chi^2 = 0.76$, $P = 0.38$), mode of delivery ($\chi^2 = 0.02$, $P = 0.90$), infant feeding method ($\chi^2 = 1.03$, $P = 0.31$), and hospital readmissions ($\chi^2 = 0.10$, $P = 0.82$). However, consistent with the literature [1], significantly more women with depressive symptomatology had lower household incomes than those in the non-depressive group at 8-weeks postpartum ($F = 9.01$, $P = 0.003$).

Table 3 Test of equality of group means and structure matrix

Domain	Provision	Wilks' λ	*F*	*P*	Function
Global	Attachment	0.96	17.33	0.00	0.44
	Guidance	0.98	7.87	0.01	0.39
	Nurturance	1.0	.03	0.86	0.05
	Reliable alliance	0.98	5.90	0.02	0.33
	Reassurance of worth	0.96	13.86	0.00	0.44
	Social integration	0.95	21.00	0.00	0.45
Partner	Attachment	0.96	14.51	0.00	0.52
	Guidance	0.97	13.17	0.00	0.44
	Nurturance	0.98	4.75	0.04	0.24
	Reliable alliance	0.93	26.78	0.00	0.64
	Reassurance of worth	0.95	20.00	0.00	0.49
	Social integration	0.95	19.57	0.00	0.48
Mother	Attachment	0.99	3.26	0.07	0.19
	Guidance	0.99	2.36	0.13	0.14
	Nurturance	0.99	.94	0.33	0.11
	Reliable alliance	0.99	3.07	0.08	0.10
	Reassurance of worth	0.99	3.64	0.06	0.24
	Social integration	0.99	3.59	0.06	0.11
Women with children	Attachment	0.96	13.64	0.00	0.46
	Guidance	0.97	11.42	0.00	0.42
	Nurturance	0.99	5.01	0.03	0.31
	Reliable alliance	0.98	6.05	0.01	0.42
	Reassurance of worth	0.97	9.04	0.00	0.43
	Social integration	0.97	10.13	0.00	0.45
	Annual household income	0.98	6.24	0.01	0.08
	EPDS 1 week	0.90	39.97	0.00	−0.79

To determine which global and relationship-specific support variables at 1-week postpartum would correctly classify women with depressive and non-depressive symptomatology at 8-weeks, a discriminant function analysis with stepwise entry was performed. All global and relationship-specific support subscales were included in the model [38]. Due to a significant difference between depressive and non-depressive women, income was included in the analysis; depressive symptomatology at 1-week postpartum was also controlled for in this analysis through inclusion in the model. To examine the usefulness of each subscale in the discriminant function, tests of equality were performed and the structure matrix was examined (Table 3). Importantly, significant differences in subscale means were found between depressed and non-depressed mothers. Correlations between the global and relationship-specific support subscales, EPDS score at 1 week, and income ranged from −0.01 to 0.84. Using the default value for entry set at 0.05, four variables, reliable reliance from

Table 4 Variables in discriminant functional analysis

Domain	Provision	Tolerance	Significance of *F* to remove	Wilks' λ	Standardized coefficient
Partner	Reliable alliance	0.57	0.00	0.89	0.68
	Nurturance	0.96	0.01	0.87	−0.38
Women with children	Attachment	0.58	0.03	0.86	0.35
EPDS 1 Week		0.91	0.00	0.90	−0.63

partner, nurturance from partner, attachment to other women with children, and EPDS score at 1-week postpartum differentiated the two groups (Table 4). The eigenvalue for this model was 0.18, explaining 100% of the variance, and the canonical correlation was 0.39. The Wilks' lambda χ^2 transformation for the discriminant function was significant ($\chi^2 = 59.24$, $P < 0.001$). The standardized discriminate function coefficients are presented in Table 4. In this model, 78.6% of original grouped cases at 8-weeks postpartum were correctly classified based on EPDS scores at 1-week postpartum and scores on the following provision subscales: reliable reliance from partner, nurturance from partner, and attachment to other women with children.

Discussion

The aim of this population-based study was 2-fold: (1) to determine whether women discriminated between global and relationship-specific perceptions of support and (2) to examine the influence of global and relationship-specific perceptions of support in the immediate postpartum period on the development of depressive symptomatology at 8-weeks postpartum. Overall, the results of this study confirm previous research suggesting social support in general is an important postpartum depression risk factor [1, 43]. However, the study extends this body of research and is the first known investigation to specifically examine the influence of both global and relationship-specific perceptions of support on depressive symptomatology.

The results of this study endorse previous theoretical and empirical work [13] suggesting that social support perceptions are not simply a summation of support available through the specific relationships [13]. The relative independence of relationship-specific and global perceptions of support was demonstrated through weak correlations between specific domains and the factor analysis. Although support from the partner and other women with children was significantly and positively correlated with global support, the strength was only moderate. Additionally, while regression analysis revealed that specific provisions of support from every domain were predictive of global support, nearly two-thirds of the variation in total global support scores remained unexplained. These results suggest that global perceptions are to a considerable degree unexplained by perceptions of relationship-specific support and may reflect a personality trait. These findings are also consistent with the view that an individual's perceptions of support within a specific relationship reflect unique experiences with the other person that give rise to distinctive expectations regarding the likelihood of receiving support from the person [47]. Thus, social interactions between the mother and her network members lead to heterogeneous relationships that differ in supportiveness. However, it should be noted that in this investigation only three relationship-specific domains were examined. While this limited number of relationships was included in order to decrease participant burden, other important sources of support may have been excluded. This limitation may be particularly salient for women from diverse cultures who frequently practice traditional postpartum rituals that include organized support from a female relative [19, 21–25, 41–25, 54–25, 59]. While some research indicates these postpartum rituals may have a protective effect [19], other research suggests it may just delay the development of postpartum depression [25]. Further yet, other researchers have found it has little effect on maternal mood [28]. Additional research is needed to understand the nature and extent of this organized postpartum support and its contribution to maternal perception of global or relationship-specific support and the impact on postpartum mood.

Based on differences in group means presented in Table 3, women with depressive symptomatology had significantly lower perceptions of global support than those with non-depressive symptomatology except for the opportunity for nurturance provision. This provision was also inconsequential for the mother and women with children relationship-specific domains. This is not an unexpected finding considering Weiss [58] suggested that one's offspring is the most frequent source of opportunity for nurturance. However, this provision in the partner domain was significantly predictive of depressive symptomatology at 8-weeks postpartum. Weiss included this provision in his theoretical model of social support indicating it has implications for self-esteem and the promotion of feeling needed by others. Thus, it appears women require perceptions that their partners need them. This is an interesting finding that warrants further investigation and highlights the importance of feeling needed for mental well-being.

Research suggests that in the immediate postpartum period most women encounter threats to their self-esteem; these threats raise doubts about their mothering ability and increase their risk for developing postpartum depression [21, 41, 42, 48, 49]. The availability of an individual to discuss personal difficulties and to provide reassurance is a strong supportive resource that counters the effect of self-esteem threats. This reassurance is frequently termed emotional support and has consistently been linked to the development of postpartum depression [16, 44, 54]. The availability of a non-judgmental and empathetic person to discuss difficulties and to provide realistic expectations and reassurances may be a simple preventative strategy or treatment option to enhance feelings of worth and perceptions of support and is consistent with maternal treatment preferences [3, 4, 20, 30, 33, 53]. Based on the results of this study suggesting the importance of support from other women with children with a particular focus on attachment, postpartum support groups specifically targeting depression or challenges in the postpartum period may be an effective treatment option or a secondary preventive intervention. These groups can offer mothers with a network of 'like women' and a safe environment to express their feelings [20]. Furthermore, mothers who participate in these peer activities are more likely to receive additional positive reinforcement and have access to normative information, which may decrease the intensity of their affective reactions [14].

While a meta-analysis suggests a poor marital relationship is a significant postpartum depression risk factor [1], it was unknown what particular aspect of the relationship had the most negative effect. The results of this study imply that while all the partner-related support provisions were significantly associated with depressive symptomatology at 8-weeks postpartum, women's inability to rely on their partner was another predictive provision. Thus, it appears women's assurance that their partner can be counted upon for assistance may have a protective effect. This finding is consistent with qualitative research where mothers indicate the need for not only emotional but also instrumental support from their partner such as assistance with childcare or household responsibilities [20, 45, 50, 56]. The strong relationship between partner support and postpartum depression suggest a promising mechanism for interventions aimed to prevent or treat postpartum depression and several studies targeting the couple have been conducted [35, 36]. For example, in an Australian randomized controlled trial first-time couples that received an antenatal session where they discussed possible postpartum concerns and hypothetical scenarios depicting stressful situations experienced higher partner awareness of maternal feelings and higher maternal satisfaction with the sharing of home and baby tasks at 6 weeks than couples who did not receive the intervention [29]. This finding suggests that attention to prenatal expectations of postpartum support may be one way to influence the incidence of postpartum depression [26, 37] and continued efforts to identify strategies to increase postpartum partner support and marital satisfaction are warranted [26].

While the participants in this study were diverse in relation to socio-economic and educational levels, a low proportion of ethnic minorities and single women limit our study findings. It is also noteworthy that 22% of eligible women declined participation due to stress/too busy or a lack of interest leading to potential sampling bias. No psychiatric clinical interviews were conducted thus decreasing the generalizability of the study findings to the diagnosis of postpartum depression. Furthermore, it is unknown how many mothers experienced depressive symptoms antenatally. While we controlled for depressive symptomatology at 1-week postpartum in the discriminant analysis, this study cannot demonstrate a clear causal pathway as to whether global and relationship-specific support were functions of preexisting mood or a protective factor against subsequent depressive symptoms. Despite these limitations, this study has important clinical implications in relation to preventive and treatment interventions.

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