

Dr Erkin Sagiev
GenAI assistance
in the quantitative
studies



Kit Yates asked ChatGPT:
It takes 3 towels 3 hours to dry on the line, how long does it take nine towels to dry?



In this scenario, where it takes 3 towels 3 hours to dry on the line, we can make a rough assumption that the drying time is somewhat proportional to the number of towels. To estimate how long it might take nine towels to dry, you can use a simple proportion:



If 3 towels take 3 hours to dry, it means that 1 towel takes 3 hours to dry (3 hours / 3 towels = 1 hour/towel).

So, if 1 towel takes 1 hour to dry, and you have 9 towels, it would take approximately 9 hours for all nine towels to dry when aired outside at the same time.



George Dowson

Research Scientist at Colleges and Universities in the United Kingdom (2012–present) · Author has **539** answers and **4.5M** answer views · 4y

If a tea towel takes 2 hours to dry on a line, how long will 4 tea towels take?

Insufficient information to give a definitive answer.

How are you placing them on the line and how wet are they?

We have a few obvious answers: 8 hours, 2 hours, 2 and-a-bit hours or a prolonged period.

1: Assuming uniform wetness (in my experience a truly sodden towel will take longer than 2 hours to dry), **it will take 8 hours to dry the tea towels one at a time.**

2: It may take **2 hours** to dry all four if they are all placed on the line *separately* at the same time and the drying rate is uniform across the line.

3: It may also take **fractionally more than 2 hours** to dry all 4 towels if they are drying somewhere with low air speeds, as the nearby air will be more moisture-saturated, slowing evaporation.

4: If you place all four towels *on top of each other* on the line, it will take **significantly longer than 8 hours, possibly as many as 24 hours** (depending on weather conditions and night-time temperatures) to dry the towels.

It is not so primitive. The sufficient information is key!

E

It takes 1 towel 1 hour to dry on the line, how long does it take nine towels to dry? Drying time is not proportional to the number of towels.



If drying time is not proportional to the number of towels, then it would still take 1 hour to dry nine towels. Each towel dries independently of the others, so the drying time for nine towels is still 1 hour.



MICHAEL A. GARCIA  AND DEBRA UMBERSON  University of Texas at Austin

Marital Strain and Psychological Distress in Same-Sex and Different-Sex Couples

A sample of 3839 words was used. It included:

- Background: Marital strain—as reported by each spouse—was compared with men in same-sex and different-sex marriages. The association is also stronger in same-sex marriages when reported strain only.
1. Marital strain and psychological distress
 2. Dyadic processes within marriage
 3. Gender, marital strain, and psychological well-being
 4. Same-sex couples and a gender-as-relational perspective

Method: in these associations have been consistent for heterosexual couples.

1. Data and sample
2. Measures
3. Analytic strategy

Table 2 of the results.

Marriage benefits physical and emotional well-being (Carr & Springer, 2010). However, it is not marital status alone that matters. Among the married, marital quality is also a key predictor of health and well-being, with substantial evidence showing that marital strain is strongly associated with psychological distress (Hawkins & Booth, 2005; Proulx, Helms, & Buehler, 2007). Although the association between marital strain and psychological distress is well-established, most studies have

The page formatting was adopted in two ways:

1. Greek letters and subscriptions were converted into LaTeX
2. Descriptors of the variables were separately presented

Model 1

$$\begin{aligned} \text{Level 1: } y_{ij}(\text{respondent psychological distress}) \\ = \beta_0 + \beta_{ij}x_{ij1}(\text{respondent marital strain}) \\ + \beta_i x_{i2}(\text{respondent is woman}) + \beta_i x_{i3}(\text{spouse is woman}) \\ + \beta_j x_{j4}(\text{day}) + \beta_i x_{i5}(\text{age}) + \beta_i x_{i6}(\text{education}) \\ + \beta_i x_{i7}(\text{employment status}) + \beta_i x_{i8}(\text{spouse health status}) \\ + \beta_i x_{i9}(\text{relationship duration}) \\ + \beta_i x_{i10}(\text{children in household}) \\ + \varepsilon_{ij}. \end{aligned}$$

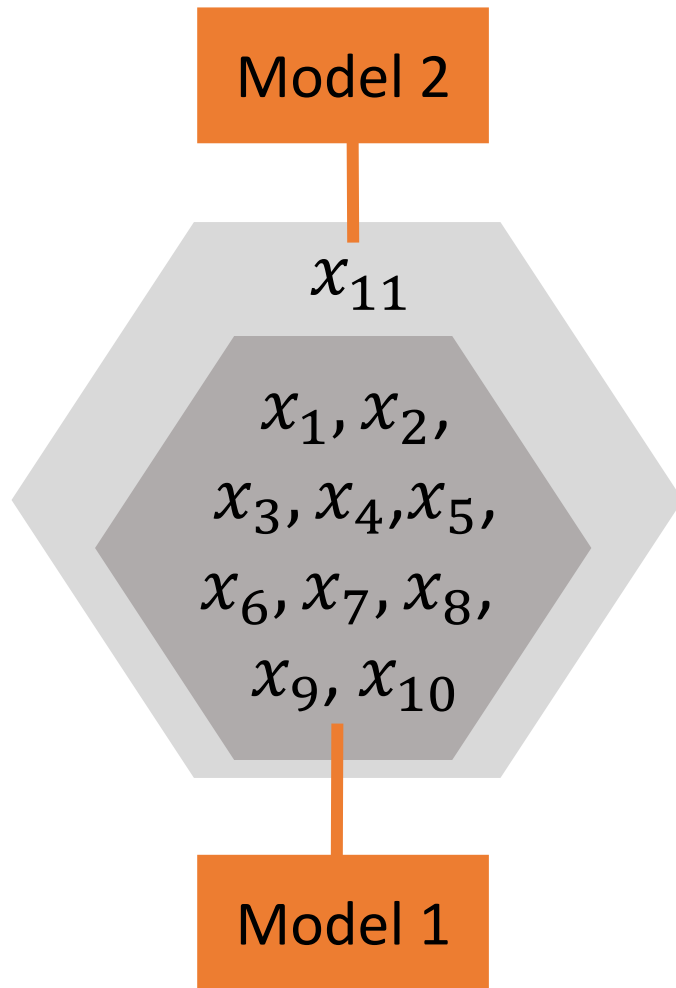
$$\text{Level 2: } \beta_0 = \gamma_0 + P_{0i} + D_{0j}$$

Model 2

$$\text{Level 1: Model 1} + \beta_{i11}x_{i11}(\text{spouse marital strain})$$

$$\text{Level 2: } \beta_0 = \gamma_0 + P_{0i} + D_{0j}$$

following models. Model 1 consists of two levels. Level 1: $y_{ij} = \beta_0 + \beta_{ij} x_{ij1} + \beta_i x_{i2} + \beta_i x_{i3} + \beta_j x_{j4} + \beta_i x_{i5} + \beta_i x_{i6} + \beta_i x_{i7} + \beta_i x_{i8} + \beta_i x_{i9} + \beta_i x_{i10} + \varepsilon_{ij}$. Level 2: $\beta_0 = \gamma_0 + P_{0i} + D_{0j}$. Model 2 consists of two levels. Level 1: Model 1 + $\beta_{i11} x_{i11}$. Level 2: $\beta_0 = \gamma_0 + P_{0i} + D_{0j}$. Model 1 estimates the associations between respondent psychological distress, respondent marital strain, and covariates, whereas Model 2 adds spouse marital strain. y_{ij} is respondent psychological distress. x_{ij1} is respondent marital strain. x_{i2} is respondent is woman. x_{i3} is spouse is woman. x_{i4} is day. x_{i5} is age. x_{i6} is education. x_{i7} is employment status. x_{i8} is spouse health status. x_{i9} is relationship duration. x_{i10} is children in household. x_{i11} is spouse marital strain. The Level 2 equation in each model



Model 3: Model 2

$+\beta_i x_{i12}(\text{respondent is woman} \times \text{spouse is woman})$

Model 4: Model 2

$+\beta_i x_{i13}(\text{respondent is woman} \times \text{marital strain})$

Model 5: Model 2

$+\beta_i x_{i14}(\text{spouse is woman} \times \text{marital strain})$

Model 6: Model 2

$+\beta_i x_{i12}(\text{respondent is woman} \times \text{spouse is woman})$

$+\beta_i x_{i13}(\text{respondent is woman} \times \text{marital strain})$

$+\beta_i x_{i14}(\text{spouse is woman} \times \text{marital strain})$

$+\beta_i x_{i15}(\text{respondent is woman} \times \text{spouse is woman} \times \text{marital strain})$

E

Based on the quoted text below, what variable is included only in Model 6?



"Marital quality—that is, levels of strain and support within marital unions—affects both physical and emotional health (Carr & Springer, 2010). Prior studies consistently show that higher marital quality enhances well-being (Carr, Freedman, Cornman, & Schwarz, 2014),



The variable included only in Model 6 is the three-way interaction term "respondent is woman \times spouse is woman \times marital strain." This interaction term examines how the association of marital strain with psychological distress varies based on the gender of both the respondent and their spouse, and whether this variation is affected by marital strain.



Model 6: Model 2

$+\beta_i X_{i12}(\text{respondent is woman} \times \text{spouse is woman})$

$+\beta_i X_{i13}(\text{respondent is woman} \times \text{marital strain})$

$+\beta_i X_{i14}(\text{spouse is woman} \times \text{marital strain})$

$+\beta_i X_{i15}(\text{respondent is woman} \times \text{spouse is woman} \times \text{marital strain})$

Table 2. *Estimates From Multilevel Regression Models Testing Respondent- and Spouse-Reported Marital Strain on Respondent Psychological Distress (n = 756 Individuals, 378 Couples)*

Variable	Model 1		Model 2	
	B	SE	B	SE
Respondent marital strain	0.62***	0.02	0.59***	0.02
Spouse marital strain			0.16***	0.02
Covariates				
Respondent woman	0.70***	0.19	0.73***	0.19
Partner woman	−0.04	0.19	−0.05	0.19
Day	−0.15***	0.01	−0.14***	0.01
Age	−0.03+	0.01	−0.03+	0.01
Education (postgraduate degree)	−0.23	0.18	−0.25	0.18
Employment status (not working)	0.33	0.23	0.36	0.24
Spouse health status				0.27
Relationship duration				0.02
Children in household				0.23
Constant				0.68
Random-effects parameters				
Partner variance	5.21		5.18	
Partner covariance	1.77		1.53	
Daily variance	1.65		1.69	
Residual variance	6.88		6.74	

+*p* < .10, **p* < .05, ***p* < .01, ****p* < .001.

The table was converted into CSV format.
The table uses word “beta”, not “coefficient”.
No interpretation of the results was included.

E

According to the quoted text below, list the variables of Model 2 which coefficients are statistically significant.

General knowledge

What is a variable?



What is a coefficient?



Coefficient is a beta



What is statistically significant?



$p < 0.05$ is needed



Specific knowledge

List of the variables



Day

The table contents betas



-0.14***

*** is $p < 0.01$



From the quoted text, it appears that the following variables in Model 2 have statistically significant coefficients:

- 1. **Spouse marital strain:** The coefficient for "Spouse marital strain" in Model 2 is 0.16***, which indicates statistical significance at the $p < .001$ level.
- 2. **Respondent woman:** The coefficient for "Respondent woman" (indicating the gender of the respondent as a woman) in Model 2 is 0.73***, which indicates statistical significance at the $p < .001$ level.
- 3. **Day:** The coefficient for "Day" in Model 2 is -0.14***, which indicates statistical significance at the $p < .001$ level.

Please note that the level of statistical significance is denoted as *** for $p < .001$, which means these coefficients are highly statistically significant.

Variable	Model 2	
	<i>B</i>	<i>SE</i>
Respondent marital strain	0.59***	0.02
Spouse marital strain	0.16***	0.02
Covariates		
Respondent woman	0.73***	0.19
Partner woman	-0.05	0.19
Day	-0.14***	0.01
Age	-0.03 ⁺	0.01
Education (postgraduate degree)	-0.25	0.18
Employment status (not working)	0.36	0.24
Spouse health status (fair/poor)	0.04	0.27
Relationship duration	-0.00	0.02
Children in household	0.26	0.23
Constant	13.01***	0.68
Random-effects parameters		
Partner variance	5.18	
Partner covariance	1.53	
Daily variance	1.69	
Residual variance	6.74	

⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Hypothesis 1a: Higher levels of self-reported marital strain will be associated with higher levels of psychological distress.

E

Based on the coefficients in Table 2, state whether Hypothesis 1a is approved or rejected and provide your reasoning.



To determine whether Hypothesis 1a is supported or rejected based on the coefficients in Table 2, we need to look at the relationship between self-reported marital strain (respondent marital strain) and psychological distress.



Here are the relevant coefficients from Table 2:

- Respondent marital strain in Model 1: $\beta = 0.62$ ($p < .001$)
- Respondent marital strain in Model 2 (with spouse marital strain included): $\beta = 0.59$ ($p < .001$)

Both coefficients are statistically significant ($p < .001$), indicating that self-reported marital strain is positively associated with psychological distress. This means that individuals who report higher levels of marital strain also report higher levels of psychological distress.

Given these results, Hypothesis 1a, which states, "Higher levels of self-reported marital strain will be associated with higher levels of psychological distress," is supported by the data. In other words, the data suggest that higher self-reported marital strain is indeed associated with higher psychological distress, and therefore, Hypothesis 1a is approved.

Hypothesis 1b: Higher levels of spouse-reported marital strain will be associated with higher levels of psychological distress.

E

Based on the coefficients in Table 2, state whether Hypothesis 1b is approved or rejected and provide your reasoning.



To determine whether Hypothesis 1b is supported or rejected based on the coefficients in Table 2, we need to look at the specific coefficients related to "Spouse marital strain" and their significance levels in the multilevel regression models.



In Model 2, which includes both respondent and spouse marital strain, the coefficient for "Spouse marital strain" is given as 0.16***, with a standard error of 0.02. The *** indicates that this coefficient is highly statistically significant.

This means that there is a significant positive association between spouse-reported marital strain and respondent psychological distress. In other words, when spouses report higher levels of marital strain, it is associated with higher levels of psychological distress in the respondents.

Therefore, based on the coefficients in Table 2, we can conclude that Hypothesis 1b is supported. Higher levels of spouse-reported marital strain are indeed associated with higher levels of psychological distress, as indicated by the significant coefficient for "Spouse marital strain" in the multilevel regression model.

Findings:

- 1. ChatGPT can also compare models, advise on methodology, check for OVB, etc.**
- 2. ChatGPT can produce highly relevant outcomes specific to a paper.**
- 3. Text preparation is required: LaTeX, CSV, HTML.**
- 4. Max words is 4K. Bing AI is not a helper here.**
- 5. The main problem is that results can vary.**

Take away:

ChatGPT produces good result, only if you know what a good result is. Making it work can be an interesting challenge for students.