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Factors moderating the relationship between peer contact and self-stigma in people with mental illness

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ABSTRACT

Recent evidence suggests that peer contact may reduce self-stigma in people with mental illness as intergroup contact does public stigma. Specifically, it has been hypothesized that contact with peers who disconfirm stereotypes, compared to confirming stereotypes, may be most effective. Other characteristics of peers and individual's interactions may also moderate this relationship, such as similarity in mental health concerns; the context, content, and valence of interactions; and the closeness of the relationship between peers. In total, 1,100 Australian adults with mental illness completed an online survey evaluating the frequency of peer contact and the characteristics of participants' most frequent interactions. Consistent with previous research, there was a significant negative relationship between peer contact and self-stigma. Notably, this was stronger when peers were perceived as less similar and less close to participants. The other examined characteristics did not appear to influence the strength of this relationship, although they correlated with self-stigma in noteworthy ways. These results may inform an expansion of the intergroup contact hypothesis into internalized stigma. They may also support the deployment of existing intergroup contact interventions to reduce self-stigma, which may be less threatening to people with mental illness compared to existing interventions.

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The public and self-stigma experienced by people with mental illness (PWMI) around the world contribute to an array of adverse psychosocial and psychiatric consequences in members of this group (Dubreucq, Plasse, & Franck, 2021; Sickel, Seacat, & Nabors, 2014). Public mental health stigma refers to the endorsement of negative attitudes about PWMI by people without mental illness (Goffman, 1963), while self-stigma is commonly defined as the agreement with and internalization of public stigma by PWMI (Corrigan & Watson, 2002). Self-stigma has been recognized as being more closely associated with the injurious outcomes experienced by this group, such as to self-esteem and quality of life, than public stigma (Kao et al., 2016; Lannin, Vogel, Brenner, & Tucker, 2015). Yet, while public stigma has long been the target of interventions, there has been less research into ways in which self-stigma may be reduced. Recently, researchers have begun to examine whether contact with PWMI, which is typically used to reduce public stigma in people without mental illness, could be related to lower self-stigma in PWMI themselves. The present

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study investigates this idea, while also exploring characteristics of contact with PWMI which may strengthen its relationship with self-stigma.

Having people without mental illness interact with PWMI is a popular strategy for reducing public mental health stigma. This approach derives from the prominent intergroup contact hypothesis (Allport, 1954), which has inspired prejudice-reduction techniques for an array of stigmatised social groups, including those based on ethnicity, religion, gender, and sexuality. Intergroup contact involves an individual belonging to one social group (e.g. a PWMI) interacting in some capacity with an individual from a different social group (e.g. a person without mental illness). This is predicted to not only improve participants' attitudes toward the other individual involved in the interaction, but toward the entire social group represented by that individual. A substantial volume of both correlational and experimental research has supported this prediction – intergroup contact is both related to and in fact reduces prejudice (e.g. Pettigrew & Tropp, 2006). Moreover, a large meta-analysis of contact interventions targeting mental health stigma specifically has found them to bring about lower public stigma in participants without a mental illness, compared to stigma at baseline and in control conditions (Maunder & White, 2019). Reflecting expansions to the definition of intergroup contact which have occurred since its conceptualization, intergroup contact interventions targeting mental health stigma have variously involved participants having a getting-to-know-you conversation with a confederate with mental illness (face-to-face contact; e.g. Giacobbe, Stukas, & Farhall, 2013); imagining working on a class project with a PWMI (imagined contact; e.g. Na & Chasteen, 2016); viewing a video of a conversation between two people, one of which is a PWMI (vicarious contact; e.g. West & Turner, 2014); and a discussion with a pre-programmed bot espousing a diagnosis of mental illness (electronic contact; e.g. Maunder, White, & Verrelli, 2019).

Recently, researchers have begun examining whether contact with PWMI may also be related to lower self-stigma in PWMI themselves. Maunder and White (2022) named this extension of the intergroup contact hypothesis *peer contact*. In contrast to intergroup contact, peer contact involves individuals from the same group (e.g. PWMI) interacting with one another. Peer contact is also distinguished from other mental health-related programs, such as manualized group interventions featuring therapeutic techniques, one-on-one peer support, and consumer-operated or -lead services (e.g. Burke, Pyle, Machin, Varese, & Morrison, 2019; Fung, Tsang, & Cheung, 2011; Rüsch & Kösters, 2021). This is because the purpose of the interaction may or may not be related to the participants' shared experience as PWMI, the participants may or may not be in a stage of recovery, and the interactions are not structured or aimed at achieving specific goals, such as increasing empowerment. That is, the participants' identity as PWMI may be perceived by participants as coincidental to the interaction, as in some intergroup contact interventions. These interactions may occur face-to-face, vicariously, in participants' imagination, or electronically. Maunder and White (2022) speculated that peers may act as role models and that their characteristics may implicitly challenge societal stereotypes about PWMI being dangerous, unpredictable, incompetent, and incapable of recovery (Crisp, Gelder, Rix, Meltzer, & Rowlands, 2000), thus preventing these negative attitudes from becoming internalized by PWMI.

There is already some preliminary evidence suggestive of a negative relationship between peer contact and self-stigma. For example, in a community sample of

participants with various mental health concerns, Maunder and White (2022) found self-reported peer contact to be associated with lower personal agreement with and self-application of stereotypes, which serially mediated the relationship between peer contact and self-respect, self-esteem, and self-efficacy. Similarly, Li et al. (2020) found self-reported positive peer contact experiences to be significantly related to lower self-stigma in military veterans with depression, bipolar disorder, and schizophrenia. Outside of self-stigma, Verhaeghe, Bracke, and Bruynooghe (2008) observed the perception of support from peers to be positively related to self-esteem. As well, in experimental studies from which the direction of the relationship may be ascertained, researchers have found imagined peer contact to lower public stigma in participants with personal experience of depression (Na & Chasteen, 2016) and face-to-face contact to reduce self-stigma associated with seeking psychological help (Hartman et al., 2013; Yau, Pun, & Tang, 2011).

The above results suggest that peer contact may indeed be able to reduce self-stigma. However, research has yet to demonstrate whether the peers disconfirming stereotypes is the critical ingredient in peer contact's relationship with self-stigma, as Maunder and White (2022) theorized. Although these authors found reduced stereotype agreement to mediate the reduction of harm resulting from self-stigma, stereotype agreement could be reduced by other characteristics of peers or peer interactions. In fact, Na and Chasteen's (2016) participants reported lower public stigma after imagining contact with a person with depression, despite this person being described in a stereotype-confirming manner. Nevertheless, the idea that stereotype-disconfirming peers may bring about self-stigma-reduction accords with the importance scholars and surveyed participants have bestowed on contacted peers being recovered rather than at an acute or early stage of their illness (e.g. Conner, McKinnon, Ward, Reynolds, & Brown, 2015). It is also aligned with intergroup contact results suggesting contact with stereotype-disconfirming exemplars to be superior for the reduction of public mental health stigma (Maunder & White, 2023), and with clinical interventions which focus on challenging myths associated with PWMI (Yanos, Lucksted, Drapalski, Roe, & Lysaker, 2015). Finally, exposure to counter-stereotypical information and group members has been found to be effective at reducing internalized stigma in relation to other social groups (e.g. African Americans; Rivera & Benitez, 2016).

Maunder and White (2022) also posed further questions regarding characteristics of the interaction which may moderate its effects on self-stigma. One such characteristic is the mental health condition/s of those involved in the interaction. Specifically, they proposed that contact with peers with the same or similar mental health concerns to participants may be more effective than contact with peers with different mental health concerns, as the characteristics and experiences of those peers may be perceived as more applicable to the participant themselves. Büchter and Messer (2017) similarly suggested targeting interventions to specific mental illnesses.

Another factor which may clarify peer contact effects in relation to self-stigma is the context in which peer contact occurs. In having participants self-report their peer contact experiences, Maunder and White (2022) and Li et al. (2020) neglected to determine whether peer contact occurred within an existing mental health-related program. Thus, their results obscure whether peer contact's relationship with self-stigma may be a function of the treatment occurring in these contexts rather than peer contact per se. Apart from treatment, it may also be the discussion of mental illness and personal experiences with peers that influences the relationship between peer contact and self-

stigma. These discussions may occur both within and outside of mental health-related programs, and may strengthen the relationship between peer contact and self-stigma by drawing attention to the mental health status of the participants. When attention is drawn to social group membership in intergroup contact studies, the effect on prejudice has been found to be more pronounced (Voci & Hewstone, 2003).

Intergroup contact literature highlights other variables that may strengthen the relationship between peer contact and self-stigma. One of these is the quality or valence of peer interactions. Originally, Allport's (1954) intergroup contact hypothesis asserted that only positive interactions between groups would be effective for reducing bias. Indeed, researchers have found negative contact with various social groups to increase bias (Barlow et al., 2012; Graf, Paolini, & Rubin, 2014; Schäfer et al., 2021). The results of Li et al. (2020) appear consistent with this literature: more positively-perceived contact was related to lower self-stigma, while negatively-perceived contact was related to higher self-stigma. As positive contact is likely to be more common (Graf, Paolini, & Rubin, 2014), the overall effect of peer contact frequency on self-stigma should be negative, consistent with intergroup contact research. But, this relationship may weaken or even reverse and strengthen (Barlow et al., 2012; Graf, Paolini, & Rubin, 2014) when those frequent contact experiences are negative rather than positive.

Finally, the intergroup contact literature suggests that interactions involving individuals who are more intimately related (e.g. friends, family members, romantic relationships, roommates) may have a stronger effect on bias than interactions that are less intimate (Marinucci et al., 2021). Meta-analyses of studies measuring intergroup friendships, for example, have obtained average effect sizes larger than those calculated from all other types of intergroup contact (Davies, Tropp, Aron, Pettigrew, & Wright, 2011; Pettigrew & Tropp, 2006). Friendship or other close, time-consuming relationships with peers may similarly have a larger effect on self-stigma in PWMI compared to more superficial acquaintances.

Aims and hypotheses

The present study aims to investigate the relationship between peer contact and self-stigma and characteristics of peer contact which may moderate its relationship with self-stigma. The study's design and its analyses were pre-registered. However, it should be noted that this study was originally a longitudinal one, whereby participants reported peer contact and self-stigma at three different timepoints. Such a design would have elucidated the direction of the relationship between peer contact and self-stigma. Regrettably, however, the number of participants able to be recruited with the available resources and who were retained across three survey waves was substantially lower than required to sufficiently power the study. Specifically, the power analysis suggested that the data of at least 1,100 participants would be required in order to achieve .80 power to detect a small cross-lagged effect of 0.20, but only 329 participants could be matched across three waves. Thus, it was decided that only the data from the first survey wave should be analyzed. Data was analyzed using SPSS v27.0.1.0, and the PROCESS macro v4.3 (Hayes, 2022). The pre-registration was followed insofar as it was relevant to one wave of data. All data and materials are available alongside the pre-registration at https://osf.io/zs4cw/.

It was first hypothesized that frequency of peer contact would be significantly negatively related to self-stigma. Second, it was hypothesized that this relationship would be stronger i) when the contacted peers were perceived to be less stereotype-confirming and more stereotype-disconfirming and ii) had mental health concerns more similar to participants'; iii) when contact occurred in the context of mental health treatment compared to everyday contexts; iv) when participants more frequently discussed mental health-related topics with their peers; v) when the interactions were perceived to be positive rather than negative; and vi) when participants considered their relationship with the peer to be closer. The study was approved by the Human Research Ethics Committee of the Australian College of Applied Professions (Approval number: 792190822).

Method

Participants

To recruit participants, the study was advertised on Facebook, Reddit, and the pages of Australian mental health organizations. On Facebook, a post inviting individuals to complete a survey interested in the experiences of PWMI was sponsored so that it appeared on the newsfeed of users who indicated on their profile that they are over the age of 18 and currently residing in Australia. The researcher also gained permission to advertise the study on Facebook pages relevant to PWMI. On Reddit, information about the study was posted in the r/samplesize community, soliciting participation from Australian residents over 18 years old and with a diagnosed mental health condition. Finally, the Mental Health Fellowship of Australia assisted with recruiting PWMI from among their members through advertisements on their website. Participants had the opportunity to enter a raffle for 1 of 10 AUD$50 gift vouchers at the conclusion of the first survey. To reduce the likelihood of attracting bots, the study eligibility criteria and the value and number of gift cards to be raffled were not included in the study advertisements, and the incentive survey was disconnected from the data (Griffin et al., 2022; Lawrence, Osborne, Sharma, Spratling, & Calamaro, 2023). Notably, only three batches of highly similar email addresses (19 total emails of 1,207; random combinations of letters or random letters followed by 5 numbers) were supplied in succession, which can indicate bots (Storozuk, Ashley, Delage, & Maloney, 2020).

The flow of participants through the study is displayed in Figure 1. In total, 1,755 individuals initiated participation in the first survey, resulting in usable data from 1,100 cases once non-consenting, ineligible, incomplete and withdrawn, duplicate, and outlier cases were removed. To screen for bots in the remaining 1,100 cases, we examined the Qualtrics reCAPTCHA score, demographic inconsistencies (i.e. longer duration of mental illness than age), rate of recruitment, and time and speed of survey completion (Bybee et al., 2022; Lawrence, Osborne, Sharma, Spratling, & Calamaro, 2023; Storozuk, Ashley, Delage, & Maloney, 2020). Fourteen cases (1.3%) had a reCAPTCHA score less than .50. Only one case indicated an illness duration 9 years longer than their age. No influx of responses was observed (2–43 responses per day from January 18 to April 14). Few surveys were initiated within one minute of another response ($n = 121$, 11.0%) and never more than 7 in a row, few were recorded at unusual times of day ($n = 86$, 7.8%; i.e. 12.00–6.00 a.m.), and no responses were provided faster than 2 standard deviations

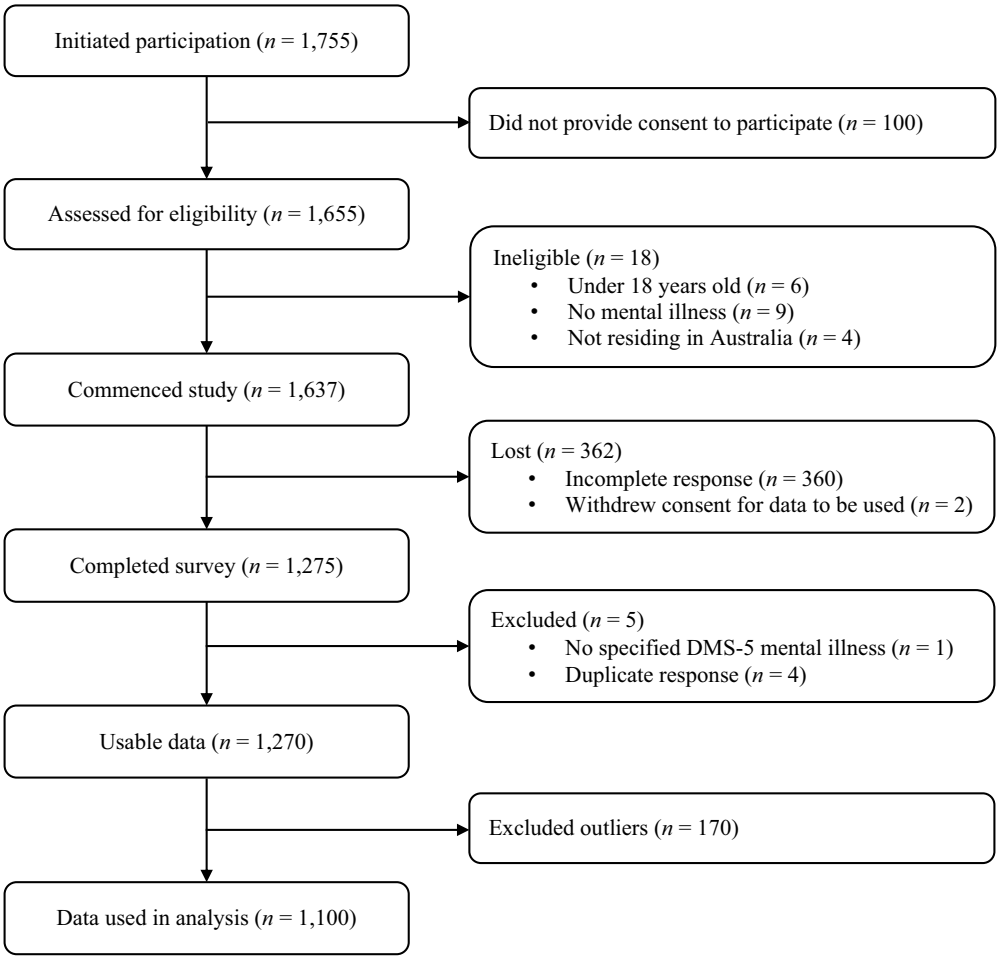


Figure 1. The flow of participants through the study.

below the mean. These 205 total cases (18.6%) were examined for concerning patterns (e.g. straight-lining, avoiding anchor-point responses) but none were detected. Further, excluding these cases from the analyses did not change the significance of any of the results. Thus, these cases were retained.

As displayed in Table 1, the majority of participants identified as women, were currently receiving help, and reported mild or moderate levels of self-stigma. While most participants reported an anxiety-related or depressive disorder, less than 20% of the sample reported one or both of these diagnoses exclusively. For example, participants reporting an anxiety-related or depressive disorder also frequently reported experiencing a trauma- and stressor-related disorder (participants with anxiety = 46.1%, participants with depression = 45.2%), a neurodevelopmental disorder (anxiety = 29.5%, depression = 26.5%), a personality disorder (anxiety = 18.8%, depression = 19.0%), and a feeding or eating disorder (anxiety = 15.8%, depression = 15.9%). Mean psychological distress was just above the midpoint of the scale, including for participants who reported having anxiety-related ($M = 3.560$, $SD = 0.629$) and depressive disorders ($M = 3.521$, $SD = 0.657$).

Table 1. Participant characteristics.

	Participants (N = 1,100)
Age (Mean, *SD*)	41.197 (13.220)
Gender (*n*, %)[†]	
Woman	875 (79.5%)
Man	147 (13.4%)
Transgender or non-binary	73 (6.6%)
Else	5 (0.5%)
Self-reported mental health diagnosis (*n*, %)[‡]	
Anxiety disorder	796 (72.4%)
Depressive disorder	763 (69.4%)
Trauma- and stressor-related disorder	492 (44.7%)
Neurodevelopmental disorder	303 (27.5%)
Personality disorder	189 (17.2%)
Bipolar or related disorder	164 (14.9%)
Feeding or eating disorder	160 (14.5%)
Obsessive-compulsive or related disorder	137 (12.5%)
Substance-related or addictive disorder	99 (9.0%)
Schizophrenia spectrum and other psychotic disorder	39 (3.5%)
Dissociative disorder	11 (1.0%)
Gender dysphoria	3 (0.3%)
Somatic symptom or related disorder	2 (0.2%)
Disruptive, impulse control, or conduct disorder	1 (0.1%)
Neurocognitive disorder	1 (0.1%)
Sleep wake disorder	1 (0.1%)
Prefer not to answer	6 (0.5%)
Years experiencing mental health symptoms (Mean, *SD*)	23.659 (13.417)
Treatment status (*n*, %)	
Currently receiving professional help	915 (83.2%)
Received professional help in the past	166 (15.1%)
No experience of professional help	4 (0.4%)
Prefer not to answer	1 (0.1%)
Psychological distress (Mean, *SD*)	3.466 (0.674)
Self-stigma (Mean, *SD*)	2.555 (0.465)
Minimal or no internalized stigma (*n*, %)	168 (15.3%)
Mild internalized stigma (*n*, %)	331 (30.1%)
Moderate internalized stigma (*n*, %)	444 (40.4%)
Severe internalized stigma (*n*, %)	157 (14.3%)

[†]Gender identity was obtained with an open-ended measure and subsequently coded using syntax developed by Cameron and Stinson (2019).
[‡]Values do not sum to 100% as participants could select multiple categories of mental illnesses.

Procedure and measures

Upon entering the online survey, participants were presented with more information about the study in the Research Participant Information Statement. They were asked to provide consent to participate and indicate their eligibility. Next, participants were asked to provide their age and gender identity and indicate their mental health diagnosis/es according to the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5; American Psychiatric Association, 2013) category of the condition/s (e.g. "Bipolar or related disorder (e.g. type I or II bipolar disorder, cyclothymic disorder)"), the number of years they have experienced mental health symptoms, and to indicate the category of treatment status they belong to.

Following the demographics questionnaire, the participants were presented with the Distress Questionnaire-5 (DQ5; Batterham et al., 2016), a brief measure of psychological distress. On five items, participants indicated how frequently in the last 30 days they had experienced feelings of hopelessness, being overwhelmed by their worries, upset in social

situations, difficulty maintaining focus, and anxiety or fearfulness in relation to their capabilities, from 1(*Never*) to 5(*Always*). The items were averaged, with a higher value indicating higher distress (Cronbach's α = .80). Then, participants completed the measures of peer contact and self-stigma described below.

Peer contact measures

All items in this section were measured on a 0(*Never, Completely different, None*) to 6 (*Extremely frequently, Always, Exactly the same, All*) scale. As the measurement of the independent variable of peer contact frequency, participants were first urged to consider all of the interactions they have with PWMI, including individually and in groups, face-to-face and online, which involve discussion of mental illness or not, and which occur in a variety of contexts. Participants were asked to indicate the frequency of these interactions on a single item, as in Maunder and White (2022).

Only participants who reported more frequent contact than *Never* were presented with further questions regarding their interactions. These were presented in a randomized order and participants were instructed to consider only their most frequent interactions with other PWMI. In order to measure peer-stereotype disconfirmation, some stereotypes of PWMI were provided (i.e. responsible for their illness, dangerous, incompetent, unpredictable, unlikely to recover, different to people without mental illness, and difficult to talk to; Crisp, Gelder, Rix, Meltzer, & Rowlands, 2000), and participants were asked to indicate, using two items, the extent to which the people they interact with 1) confirm and 2) disconfirm stereotypes about PWMI.

As a measure of the similarity between participants' mental health concerns and the mental health concerns of their most frequently contacted peers, participants were asked to rate the degree of similarity between their mental illness diagnosis/es and the mental illness diagnosis/es of their contacted peers on a single item. Two items were used to ascertain the frequency with which participants interacted with other PWMI 1) in the context of receiving mental health treatment or support (e.g. in hospital, doctor's office, rehabilitation centers, community support groups, and buddy programs) and 2) in everyday settings not related to their mental health concerns. Similarly, in order to ascertain the frequency with which participants discussed mental illness during interactions with peers, participants were asked how often they or the PWMI they interact with discuss topics to do with mental illness (e.g. symptoms, treatments, stigma and discrimination).

Following Barlow et al. (2012), using two items, participants were asked to indicate how often their peer interactions are 1) positive/good and 2) negative/bad. Separately, participants were asked to reflect on the intimacy or closeness of their most frequent peer interactions and indicate how many of the peer interactions they had involved individuals they feel very close to (e.g. friends, family members, romantic partners, and people participants live with) versus general acquaintances.

Self-stigma

The nine-item Internalized Stigma of Mental Illness scale (ISMI-9; Hammer & Toland, 2017) was selected to evaluate participants' level of self-stigma. Participants rated their agreement with each item (e.g. "I feel out of place in the world because I have a mental illness") on a scale from 1(*Strongly Disagree*) to 4(*Strongly Agree*). Following reverse coding, the items were averaged, with higher values representing higher self-stigma (α = .75).

According to Lysaker, Roe, and Yanos (2007), total scores can be interpreted as indicating minimal or no internalized stigma (scores 1.00–2.00), mild internalized stigma (2.01–2.50), moderate internalized stigma (2.51–3.00) or severe internalized stigma (3.01–4.00).

Results

Data preparation

Data preparation and analyses followed the pre-registered plan. One participant neglected to respond to one of the ISMI-9 items. Little's MCAR test was not significant (χ^2 (8) = 7.069, p = .529), suggesting the response to be missing at random. For participants who reported higher frequency of peer contact than *Never* (n = 1079), 438 (40.5%) participants were missing at least one response to a peer contact variable. However, Little's MCAR test was not significant (χ^2 (717) = 775.764, p = .063), suggesting the responses to be missing at random. Expectation maximization was used to impute these missing values. The positive and negative valence items correlated with one another at r = −.729, so the negative item was reversed and averaged with the positive item to create a single valence index (α = .84). The assumptions of multiple regression (i.e. multivariate normality, linearity, multicollinearity, independence of residuals) were met.

Data analysis

As displayed in Table 2, the peer contact variables were intercorrelated in noteworthy ways. Specifically, the degree to which contacted peers disconfirmed stereotypes about PWMI, the degree of perceived similarity in mental health concerns with contacted peers, the proportion of peer interactions occurring in everyday contexts, the proportion of peer interactions involving discussion of mental health-related topics, the valence of peer interactions, and closeness with contacted peers, were all significantly positively intercorrelated. They were also significantly positively correlated with peer contact frequency, and primarily significantly negatively correlated with self-stigma. In contrast, the degree to which contacted peers confirmed stereotypes about PWMI and the proportion of peer interactions occurring in mental health contexts were significantly positively intercorrelated, variously positively and negatively correlated with the other peer contact variables, not significantly correlated with peer contact frequency, and significantly positively correlated with self-stigma.

Model 1 of Hayes (2022) PROCESS macro was used to test the hypotheses. Peer contact frequency was entered as the independent variable in each model and self-stigma as the dependent variable, with the other peer contact variables entered as moderators in separate models. Mean centering was used to create the interaction terms, and 5,000 bootstrap samples were employed. Significant (p < .05) interactions were probed to examine the relationship between peer contact frequency and self-stigma at −1*SD*, the mean, and + 1*SD* of the moderator.

As displayed in Table 3, peer contact frequency was significantly negatively related to self-stigma in every model. Moreover, controlling for the relationship between peer contact frequency and self-stigma, peer stereotype confirmation, peer mental illness similarity, and peer contact in a mental health context, were each significantly positively

Table 2. Means (and standard deviations) of and correlations between variables.

	Mean (*SD*)	1	2	3	4	5	6	7	8	9	10
1. Peer contact frequency	4.067 (1.610)	–									
2.Peer stereotype confirmation	2.587 (1.321)	.008	–								
3.Peer stereotype disconfirmation	3.600 (1.196)	.197**	−.624**	–							
4. Peer illness similarity	3.617 (1.206)	.329**	.082**	.060	–						
5. Peer contact mental health context	1.623 (1.657)	.025	.180**	−.064*	.106**	–					
6. Peer contact everyday context	4.280 (1.601)	.296**	−.157**	.244**	.171**	−.601**	–				
7. Peer contact mental illness content	3.180 (1.415)	.403**	.094**	.113**	.394**	.239**	.068*	–			
8. Peer contact valence	3.947 (1.131)	.200**	−.374**	.329**	.184**	−.136**	.228**	.176**	–		
9. Peer intimacy	3.726 (1.562)	.262**	.008	.091**	.231**	−.179**	.340**	.175**	.113**	–	
10. Self-stigma	2.555 (0.465)	−.158**	.240**	−.197**	.037	.115**	−.183**	−.056	−.372**	−.008	–

*$p < .05$, **$p < .01$.

related to self-stigma, whereas peer stereotype disconfirmation, peer contact in everyday contexts, and peer contact valence were significantly negatively related to self-stigma. However, peer contact in which mental health was discussed and peer intimacy were not significantly directly related to self-stigma. Moreover, only peer mental illness similarity and peer intimacy significantly interacted with peer contact frequency on self-stigma. Probing these interactions revealed that the relationship between peer contact frequency and self-stigma was more strongly negative when peers were less similar compared to when peers were more similar and when the relationship with peers was less intimate compared to more intimate.

Exploratory analyses

It was possible that the large number of moderator analyses in the present study may have caused some significant results to emerge simply as a function of chance. In order to examine the stability of these results, the interactions between peer contact with peer mental illness similarity and peer intimacy were examined in the data gathered at T2 and T3. In order to preserve power, all data was retained in these analyses, including responses that could not be matched to a T1 response. In total, 62 of the 588 (10.5%) responses at T2 were not matched to a T1 response, and 398 of the 514 (77.43%) T3 responses were not matched to a T1 response. Thus, the T2 and T3 data were somewhat independent from the T1 data, but as participants did not provide demographics in these later survey waves, the eligibility of the participants providing the T2 and T3 responses (e.g. their mental health status) cannot be determined.

In the T2 data, the interaction between peer contact frequency with both peer mental illness similarity ($b = .036$, $SE = .013$, 95% CI [.010, .061]) and peer intimacy ($b = .025$, *SE*

Table 3. Coefficients, standard errors, and bootstrapped confidence intervals.

	Peer contact frequency on self-stigma		Moderator on self-stigma		Interaction on self-stigma	
Model Moderator	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI	*b* (*SE*)	95% CI
Peer stereotype confirmation	**-.048 (.009)**	**-.065, −.30**	**.085 (.010)**	**.065, .105**	−.005 (.006)	−.018, .007
Peer stereotype disconfirmation	**−.037 (.009)**	**-.055, −.018**	**-.067 (.012)**	**-.090, −.044**	.001 (.007)	−.014, .015
Peer illness similarity	**−.052 (.010)**	**-.071, −.033**	**.042 (.012)**	**.018, .066**	**.024 (.007)**	**.009, .038**
-1 *SD*	**-.081 (.012)**	**-.105, −.057**				
Mean	**-.052 (.010)**	**-.071, −.033**				
+1 *SD*	−.024 (.014)	−.051, .004				
Peer contact mental health context	**−.048 (.009)**	**-.066, −.031**	**.034 (.008)**	**.017, .050**	−.006 (.005)	−.017, .005
Peer contact everyday context	**−.033 (.009)**	**-.052, −.015**	**-.042 (.009)**	**-.060, −.024**	.003 (.005)	−.007, .014
Peer contact mental health content	**−.048 (.010)**	**-.068, −.028**	.003 (.011)	−.018, .024	<.001 (.006)	−.013, .013
Peer contact valence	**−.026 (.009)**	**-.043, −.009**	**-.147 (.012)**	**-.170, −.123**	−.009 (.007)	−.023, .006
Peer intimacy	**−.048 (.009)**	**-.066, −.029**	.013 (.009)	−.005, .032	**.012 (.005)**	**.001, .023**
-1 *SD*	**-.067 (.012)**	**-.090, −.043**				
Mean	**-.048 (.009)**	**-.066, −.029**				
+1 *SD*	**-.029 (.013)**	**-.055, −.003**				

Boldface is used to highlight significant relationships.

= .010, 95% CI [.005, .045]) on self-stigma were significant. As in the T1 data, the relationship between peer contact frequency and self-stigma at T2 was stronger when participants' mental health concerns were less similar to their peers (−1*SD*: $b = -.067$, $SE = .023$, 95% CI [−.112, −.023]; Mean: $b = -.024$, $SE = .019$, 95% CI [−.062, .013]; +1*SD*: $b = -.019$, $SE = .027$, 95% CI [−.034, .072]) and when participants' relationship with their peers was less close (−1*SD*: $b = -.073$, $SE = .025$, 95% CI [−.122, −.024]; Mean: $b = -.030$, $SE = .023$, 95% CI [−.067, −.006]; +1*SD*: $b = .013$, $SE = .026$, 95% CI [−.037, .063]). These interactions were not significant in the T3 data.

Discussion

The aim of the present study was to examine the relationship between peer contact frequency and self-stigma and investigate characteristics of peer contact that may strengthen this relationship. As hypothesized, peer contact frequency was significantly negatively related to self-stigma, such that participants who reported more frequent

contact with other PWMI also tended to report lower self-stigma. Contrary to hypotheses, however, few of the characteristics of peer contact explored in the study moderated this relationship. That is, the extent to which contacted peers confirmed or disconfirmed stereotypes did not significantly interact with peer contact frequency on self-stigma. In addition, the relationship between peer contact frequency and self-stigma did not appear to depend on whether contact most frequently occurred in the context of mental health or everyday contexts, whether participants discussed mental health-related topics with their peers, and the positivity (vs. negativity) of the interactions. That said, many of these variables were correlated with self-stigma in noteworthy ways. The similarity of mental health concerns that participants perceived to have with their contacted peers and the intimacy of the relationship with peers did significantly moderate the relationship between peer contact frequency and self-stigma, but not in the expected direction. Specifically, the negative relationship between peer contact frequency and self-stigma was stronger when peers were perceived as less similar in their mental health concerns rather than more similar and when participants perceived the relationship with their contacted peers to be less close rather than more close. Importantly, these interactions also emerged as significant in the data collected at T2, although not in the data collected at T3.

That peer contact, as a whole, was negatively related to self-stigma is consistent with earlier research by Maunder and White (2022). Here, participants who reported interacting with peers more often also tended to report lower personal agreement with and self-application of stereotypes. As well, the results are consistent with those of studies finding contact with PWMI to be associated with outcomes related to self-stigma, including higher self-esteem and self-efficacy (Maunder & White, 2022; Verhaeghe, Bracke, & Bruynooghe, 2008) and lower help-seeking self-stigma (Hartman et al., 2013; Yau, Pun, & Tang, 2011). By specifically recruiting participants with mental illness and using a different measure of self-stigma to Maunder and White (2022), the present study increases confidence in the expansion of the intergroup contact hypothesis that peer contact may represent.

At the same time, however, the degree to which contacted peers adhered to stereotypes did not moderate the relationship between peer contact frequency and self-stigma. That said, it should be noted that stereotype confirmation and stereotype disconfirmation were, respectively, directly positively and negatively related to self-stigma. This is somewhat consistent with Maunder and White's (2022) speculation that stereotype disconfirmation plays a critical role in the relationship between peer contact and self-stigma. Specifically, they suggested that peers may act as role models, and that their stereotype-disconfirming characteristics would reduce agreement with societal stereotypes about PWMI and thus reduce the self-application of these stereotypes. It is also consistent with intergroup contact research aiming to reduce public mental health stigma (Maunder & White, 2023) and research into internalized stigma in other social groups (Rivera & Benitez, 2016). Further, it may indirectly support the practice of challenging myths about PWMI in clinical self-stigma reduction programs (Yanos, Lucksted, Drapalski, Roe, & Lysaker, 2015) and the idea that contact with recovered peers is important for self-stigma reduction (e.g. Conner, McKinnon, Ward, Reynolds, & Brown, 2015), although the measurement of peer stereotypicality in the current study did not reference recovery specifically. That this variable did not significantly interact with peer contact frequency on self-stigma may

suggest that the *quantity* of interactions with peers disconfirming stereotypes is less important than the *extent* to which these peers do, when they are interacted with. Future studies may investigate this further by manipulating the stereotypicality of peers in experimental peer contact studies.

It was also hypothesized that perceiving contacted peers' mental health concerns to be more similar, compared to less similar, to the participant's own mental health concerns may strengthen the relationship between peer contact frequency and self-stigma. Instead, in both the T1 and T2 data, more frequent contact with less similar peers appeared to be more strongly associated with lower self-stigma. One possibility is that participants' less-similar contacted peers were perceived to have either more or less complex or severe mental health concerns. Limited research has been conducted into social comparison in PWMI, and we are not aware of any study that has examined how this may contribute to self-stigma. However, Mojtabai's (2008) research suggests that individuals who perceive themselves to be equally or less distressed compared to others are less likely to have sought mental health help and less likely to perceive that they needed mental health treatment but did not receive it. This may suggest that perceiving others as doing worse may reduce perceptions of the severity of one's own mental illness, which may also reduce self-stigma. Indeed, other studies have suggested lower self-perceived clinical severity to be associated with lower self-stigma (Dubreucq, Plasse, & Franck, 2021). In the reverse, contact with peers with less complex or severe concerns may engender hope regarding the possibility of the individual's own recovery. In comparison, contact with more similar peers may reinforce participants' negative perception of themselves and other PWMI.

Also contrary to hypotheses, the context in which peer interactions most frequently occurred did not significantly moderate the relationship between peer contact frequency and self-stigma as expected. Here, it was anticipated that peer interactions occurring in mental health contexts would strengthen the negative relationship between peer contact frequency and self-stigma, due to the fact that other elements of these contexts may positively influence self-stigma. In contrast, peer interactions occurring outside of these contexts may be less impactful. Instead, although there was no interaction between these variables and peer contact frequency on self-stigma, the direct relationships between these variables and self-stigma suggest that peer contact occurring in mental health-related contexts is related to higher self-stigma, whereas peer contact occurring in everyday contexts is related to lower self-stigma. It should be noted that the measure of peer contact occurring in mental health contexts did not distinguish between the many mental health contexts in which individuals may interact with other PWMI. These contexts might include psychiatric wards and outpatient waiting rooms as well as programs intended to reduce self-stigma, the former of which may worsen self-stigma rather than reducing it. For example, some research has found there to be a positive relationship between self-stigma and the number of hospitalisations for mental illness, which could be due to PWMI interacting with peers in an acute stage of their illness in these contexts (for a review, see: Dubreucq, Plasse, & Franck, 2021). In contrast, interacting with other PWMI who may be in a less acute stage may be less stigmatizing. Future studies could more closely examine the context in which peer contact occurred and determine whether some contexts may promote self-stigma compared to others.

As well, the proportion of peer interactions involving a discussion of mental health-related topics did not appear to be directly related to self-stigma or to moderate the relationship between peer contact frequency and self-stigma. Although unexpected, this somewhat mirrors results in the intergroup contact and public stigma domain. Here, Maunder and White's (2019) meta-analysis of the effectiveness of contact interventions at reducing public mental health stigma, found that interventions where the PWMI's mental health condition is merely incidental to the interaction rather than the focus of it (pure contact) are as effective as interventions in which mental health conditions are central to the interaction and a focus of discussion within them (contact-based education). In the same way, merely interacting with other PWMI seems to be sufficient to reduce self-stigma. One possibility is that all kinds of interactions may reduce feelings of isolation, normalize participants' experience of mental illness, and engender identification with peers (Schon, 2010). In other studies, increased group identification has been found to be related to rejection of stereotypes, higher resistance of stigma, and lower self-stigma (e.g. Bliuc, Doan, & Best, 2019; Crabtree, Haslam, Postmes, & Haslam, 2010; Watson, Corrigan, Larson, & Sells, 2007).

In view of findings in intergroup contact research, the present study also explored whether the valence of interactions and intimacy of the participants' relationship with their peers moderated the relationship between peer contact frequency and self-stigma. Here, contact with a more positive valence did not strengthen the inverse relationship between peer contact frequency and self-stigma in comparison to contact with a negative valence, as it does the relationship between intergroup contact frequency and prejudice (Barlow et al., 2012; Graf, Paolini, & Rubin, 2014; Schäfer et al., 2021), but there was a direct relationship between contact valence and self-stigma. Specifically, more positive contact was related to lower self-stigma, consistent with Li et al. (2020). As recommended by Schäfer et al. (2021) in relation to intergroup contact, it may be worthwhile for future studies to investigate the types of peer interactions that are perceived as negative compared to positive. Some kinds of peer interactions perceived as positive by PWMI may nevertheless negatively impact self-stigma. For example, commiserating with a peer about an experience of discrimination may make an individual feel positively validated in their concerns but negatively about the situation of PWMI. Conversely, intimacy with peers did significantly moderate the relationship between peer contact frequency and self-stigma in both the T1 and T2 data, although closer relationships with peers weakened the relationship rather than strengthened it as it does in the intergroup contact domain (Marinucci et al., 2021). One possibility is that, in close relationships, individuals are more frequently and intensely exposed to the negative aspects of their peers' mental health condition, which may negatively impact their view of themselves as a PWMI. Horsfall, Cleary, and Hunt (2010) proposed the same in relation to the high level of public stigma towards PWMI observed in healthcare professionals. Alternatively, if an individual's peers exhibit high levels of self-stigma, they may be internalized by the individual themselves. Qualitative studies exploring the nature of close relationships between PWMI and their relevance for the individual's perception of themselves may be informative. At the very least, these unexpected findings may indicate that peer contact does not operate in the same way as intergroup contact.

Strengths and limitations

The presents study contributes to the existing preliminary evidence for the effectiveness of peer contact in a number of ways. For example, the present study measured mental health self-stigma rather than measuring public mental health stigma, help-seeking self-stigma, or self-esteem (e.g. Hartman et al., 2013; Na & Chasteen, 2016; Verhaeghe, Bracke, & Bruynooghe, 2008; Yau, Pun, & Tang, 2011), and did so in participants with a self-reported mental health condition rather than participants with unknown mental health status (e.g. Hartman et al., 2013; Yau, Pun, & Tang, 2011). Thus, the results of the present study are more relevant to self-stigma in PWMI in comparison to previous research. As well, the present study investigated a number of characteristics of peer contact which could have potentially strengthened the effect of peer contact on self-stigma. This may inspire multiple avenues for future research in the area of peer contact.

Regrettably, however, the present study was not able to provide clarity regarding the likely direction of the relationship between peer contact and self-stigma. Some studies in this area have observed differences between experimental groups in which participants have interacted with PWMI and control groups (Na & Chasteen, 2016; Yau, Pun, & Tang, 2011) and have observed participants' attitudes to change from pre- to post-contact (Hartman et al., 2013; Yau, Pun, & Tang, 2011). However, as outlined above, these studies have not measured self-stigma in PWMI specifically. Thus, it remains somewhat unclear whether peer contact causes reductions in self-stigma or whether participants with lower self-stigma are more likely to engage in contact with their peers. Experimental and longitudinal studies are needed here.

In addition, it is also unclear whether peer contact may be beneficial for all PWMI. The participants in the present study primarily reported mild and moderate levels of psychological distress and self-stigma. Moreover, in comparison to more severe conditions such as schizophrenia, the majority of participants reported having an anxiety-related disorder or depressive disorder – although many also reported comorbid conditions. Is peer contact also related to lower self-stigma in individuals with more severe distress, higher levels of self-stigma, and more severe mental health conditions? In intergroup contact research examining contact and prejudice against other social groups, the relationship between contact and prejudice seems to be stronger for participants who are prone to higher prejudice against the group (e.g. Hodson, Turner, & Choma, 2017), although that may not be the case when examining stigma against PWMI (e.g. Maunder, Day, & White, 2020). Individuals experiencing higher distress, self-stigma, and more severe mental health conditions may instead benefit more from programs more clinical in nature. This requires investigation, especially in light of the present study's results regarding the context in which peer contact occurs.

Related to this, it should also be noted that participants self-reported their mental health condition and level of distress. While the study required participants to affirm that they had a mental health condition diagnosed by a medical professional, it was not possible to verify if participants met diagnostic criteria for any or all conditions they reported experiencing. That is, some participants may have self-diagnosed. Does the relationship between peer contact and self-stigma differ for individuals who have self-diagnosed compared to individuals with a verified condition? Finally, whether this relationship is similar across ethnicities and cultures is unknown. While the Australian

population is diverse, the present study did not record participants' race or ethnicity, rendering it unclear whether these results are generalizable.

Further, the present study utilized single items to measure peer contact frequency and many of the moderator variables. The validity and reliability of these measures are unknown. While there are multi-item measures of intergroup contact frequency in the literature that could have been adapted to measure peer contact in the present study, these measures have participants estimate the frequency of contact occurring in specific contexts (e.g. "a college", "as friends") which may not capture all contact experiences (Maunder & White, 2022). Moreover, in the present study, such a measure may have conflated peer contact frequency with the context in which contact occurs. Measures of some of the other variables in the study, such as peer stereotype confirmation and disconfirmation, do not exist. If research is to continue in this area, measures will need to be developed and validated.

Finally, participants in this study were recruited through a direct study link posted on social media platforms such as Facebook and reddit. This may have made the study vulnerable to bots. Some steps were taken to reduce the attractiveness of the study in that regard, including utilizing a raffle form of incentive rather than individual reimbursement, as others have recommended (Griffin et al., 2022). As well, multiple methods were used to detect the existence of bots in the final dataset (Bybee et al., 2022; Lawrence, Osborne, Sharma, Spratling, & Calamaro, 2023; Storozuk, Ashley, Delage, & Maloney, 2020). A smaller number of cases were suspected to be bots in the present study compared to other studies (e.g. Bybee et al., 2022; Griffin et al., 2022; Lawrence, Osborne, Sharma, Spratling, & Calamaro, 2023; Storozuk, Ashley, Delage, & Maloney, 2020), but the rapid rate of technological advancement in this area make it impossible to guarantee that all bots were detected. Future research should aim to replicate these results using samples verified as authentic and trustworthy.

Implications and future directions

While some of the results of the present study were unexpected, they have several implications for the intergroup contact hypothesis and the development of peer contact interventions targeting self-stigma. First, the overall finding of an inverse relationship between peer contact and self-stigma provides further support for the idea that the intergroup contact hypothesis could be extended to include peer contact and self-stigma. Notably, however, the variables researchers have observed to moderate the relationship between intergroup contact and prejudice may operate differently in relation to peer contact and self-stigma. If future research finds peer contact to cause reductions in mental health self-stigma and if peer contact in other stigmatized groups appears to benefit self-perception, then researchers might advance into this new frontier by examining alternative moderators as well as mediators of peer contact effects. Above, it was proposed that social comparison and group identification may explain some of the unexpected results in the present study, and future studies might start here.

Several findings in the present study may inform the development of peer contact-based self-stigma interventions. For example, the finding that more frequent interactions with mental health-related content is unrelated to self-stigma and that peer contact occurring in everyday settings is negatively related to self-stigma, may

suggest that these interventions can and should occur outside of mental health contexts, such as in workplaces and schools, and that they do not require the discussion of mental health-related topics to be effective. Moreover, the results related to the similarity of mental health conditions between participants and their peers and the level of closeness participants feel with their peers may suggest interventions need not attempt to facilitate contact with peers with similar mental health concerns to participants and may involve peers previously unknown to participants. In fact, peers with mental health concerns quite different to participants' and who are unknown to participants may even be more effective for reducing self-stigma.

These results are particularly noteworthy, as there currently exists within the research literature a small constellation of programs that target or else impact self-stigma in PWMI (for a review, see: Yanos, Lucksted, Drapalski, Roe, & Lysaker, 2015), but which may be limited in the number of PWMI they can reach. These programs differ on a number of dimensions, including their formality, utilization of established therapeutic techniques, source and mode of delivery, and length. Overall, researchers have taken disparate perspectives on the state of the evidence surrounding these existing programs. For example, Yanos, Lucksted, Drapalski, Roe, and Lysaker (2015) were optimistic regarding further development in the area, while Büchter and Messer (2017, p. 10) were highly critical of the poor quality of reporting and high risk of bias in the studies they reviewed, concluding that the evidence is insufficient and that researchers should "take a step back". That said, more recent systematic reviews and meta-analyses have found some favorable results, suggesting that programs involving Narrative Enhancement Cognitive Therapy, psychoeducation, and multiple therapeutic components to be effective at reducing self-stigma in individuals with severe mental illness (e.g. Alonso, Guillén, & Muñoz, 2019; Jagan et al., 2023). However, it should be noted that the design of many of these interventions may make them unappealing to some PWMI and particularly PWMI with high levels of self-stigma. This is because access to and involvement in them necessitates 1) some degree of disclosure of mental health concerns (Rüsch & Kösters, 2021) and 2) help-seeking, which is stigmatized similarly to mental illness (Tucker et al., 2013) and negatively associated with self-stigma (Dubreucq, Plasse, & Franck, 2021). Finally, the programs may inappropriately pathologize self-stigma as the problem of PWMI (Corrigan, 2016). Consequently, there is a need for self-stigma reduction strategies which can be deployed on a broader scale, and which are less threatening to PWMI with high self-stigma and/or which do not require them to deliberately seek support. Peer contact may provide such an alternative, although experimental studies are now required. It may be the case that peer contact is sufficient to reduce self-stigma in some individuals, whereas others may require these more intensive interventions.

Conclusion

Consistent with previous research and mirroring the negative relationship between intergroup contact and public stigma against PWMI, the present study found a negative relationship between the frequency of peer contact and self-stigma in PWMI. Moreover, the present study revealed characteristics of peer contact which may and may not strengthen this relationship, including the closeness of

relationships with peers and similarity to peers in regards to their mental health concerns. With further research, these results may inform the development of peer contact interventions with the goal of reducing self-stigma in PWMI and associated adverse outcomes.

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No potential conflict of interest was reported by the author(s).

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Notes on contributor

Rachel Maunder is a Lecturer in the Discipline of Psychological Science at the Australian College of Applied Professions. Rachel completed her PhD at the University of Sydney in 2020, examining intergroup and peer contact as means of reducing public stigma against and self-stigma in people with mental illness. Her current research interests build from this foundation.

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Data availability statement

The data that support the findings of this study are openly available in Open Science Framework at https://osf.io/zs4cw/.

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