Reclassifying the UCLA 'Loneliness' Scales: How the UCLA has obscured the distinction between loneliness and social disconnection

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Abstract

Loneliness research has been built on the idea that loneliness is simultaneously a subjective emotional state and a perceived deficit in social connections. This ambiguity has been entrenched by the field's most widely used instrument, the Revised UCLA Loneliness Scale (R-UCLA), which is a composite scale, equally capturing both of these distinct, separable constructs. This has exaggerated the true link between loneliness and measures of social networks. While a three-item loneliness scale has been derived from the UCLA, references to it as a short-form UCLA scale are inaccurate and misleading. The UCLA thus has no valid three-item short-forms. Through a brute-force item selection process (N = 21,589) and a multi-rater validation study (N = 352), we reevaluate the R-UCLA and develop a short version. We present the UCLA-3.5 ("I feel isolated from others"; "There are people I can turn to"; "I have a lot in common with the people around me") as a psychometrically robust and efficient composite loneliness-disconnection scale that captures the R-UCLA's multidimensionality. This work clarifies the loneliness literature by offering a distinction between the experience of loneliness and social network appraisals.

Key words: *loneliness, UCLA, short loneliness scales, assessment*

Constraints on Generality

Our conclusions are drawn from two English-speaking samples. While our scale development sample was large and diverse in age, both samples were self-selected and not representative of the general population, which may limit how far our findings on the prevalence or nature of loneliness can be generalised. Our findings also comprise cross-sectional correlations, and the causal direction of these relationships cannot be established. Our validation also relied on a specific set of comparison measures; including other personality or well-being constructs would further clarify the scale's unique properties.

Our brute-force method is optimal for creating a faithful proxy of the R-UCLA, and the resulting UCLA-3.5 is, by design, a composite measure. This means it intentionally assesses feelings of loneliness alongside appraisals of one's social network. Researchers interested in assessing loneliness should therefore use a narrow loneliness measure like the TILS.

Introduction

With over 15,000 citations across just its three English language editions (Russell, 1996; Russell et al., 1978, 1980) the UCLA Loneliness Scales have become a central touchpoint in loneliness research, capturing a range of loneliness hallmarks that are predictive of mental health outcomes (e.g. Lee et al., 2021) and mortality (e.g. Perissinotto et al., 2012). However, while assessing loneliness has become an increasingly important task in recent years, the literature has been confounded with jingle and jangle fallacies.

Because of their length, a shorter alternative to the UCLA scales was needed. In 2004, Hughes and colleagues developed a new scale (the Three-Item Loneliness Scale; TILS) more convenient for use in long surveys. The authors performed factor analysis on the 1980 Revised-UCLA (R-UCLA; Hughes et al., 2004; Russell et al., 1980). Identifying a three-factor structure in the UCLA, the authors selected three of the top-loading items from the first, highest-loading factor, and discarded the remaining two factors, which captured connectedness to others. Isolating the anxiety items from a neuroticism scale would construct an anxiety scale, not a neuroticism scale. Similarly, because the TILS was extracted from just one of three identified UCLA dimensions (and because the other two dimensions contained valid variance; Dussault et al., 2009), the scales are fundamentally non-interchangeable. The authors accordingly named their short scale the Three-Item Loneliness Scale (TILS; Hughes et al., 2004), forgoing any direct link to the UCLA.

Beyond the issue of correct labelling, there is a larger theoretical problem. When a scale like the TILS is created by extracting a single dimension from a multidimensional parent like the R-UCLA, the two cannot be equivalent and also both be comprehensive measures of loneliness. Either the original R-UCLA contained substantial non-loneliness variance, or the TILS is an incomplete measure of loneliness. Which of these is the case is currently unclear, suggesting there is no consensus on what loneliness is and isn't.

The impact is severe not just in theory, but in practice, because the distinction between the TILS and the UCLA has been effectively lost in recent years. The two scales are highly similar, but it should be noted the original estimate for their similarity (r = .82) is inflated due to their shared items (Hughes et al., 2004). They are now considered interchangeable throughout the loneliness literature, and even beyond, as the TILS has incorrectly become known as the 'UCLA 3-item Loneliness Scale'. This category error is perpetuated in a cycle: first by academics in empirical studies (e.g. Mund et al., 2023; Shiovitz-Ezra & Ayalon, 2012; Steptoe et al., 2013), which are then often coded as having used a UCLA scale in meta-analyses (Buecker et al., 2021; Holt-Lunstad et al., 2015) or systematic reviews (Das et al., 2021). Local (Cullum, 2019) and national (ONS, 2018) government offices have followed suit, using the same incorrect name. This misinformation trickles down to the general population as internet searches for 'Three-item loneliness scale' produce links to many PDFs titled 'UCLA 3-item loneliness scale', often created by non-profits as a public resource describing how to administer the scale, citing governments and academics (e.g. Campaign to End Loneliness, 2024; ICMHA, 2020). These often become the most accessible information for academics looking for a short loneliness scale,

entrenching a feedback loop which distorts findings and holds back our understanding of this urgent and important topic.

Methods of scale shortening

When shortening scales, there are a few available methods. One option, used by Hughes and colleagues (2004), is to reduce a scale through factor analysis, isolating one core aspect of a multidimensional scale and discarding the remaining factors. This approach suited the researchers' original goal – to create a short unidimensional scale of loneliness – but a scale developed in this way will be fundamentally divergent from its parent.

Another popular method is the "area under the receiver operator curve method" (Koczkodaj et al., 2017). It generates a list of items, in order, showing the cumulative predictive power of all items up to the current item. From this, researchers can select the first *N* items to generate a short version of their scale. However, just as adding another leg to a three-legged stool does not necessarily create the best four-legged stool, it is not necessarily true that adding another item to a three-item scale creates the best four-item version of that scale.

In cases where the original scale is considered the 'gold standard' (Bottaro et al., 2023), the key metric of success for shortened scales is arguably to represent the scores of the scale's long version as faithfully as possible. In this case standard methods, such as those listed above, risk coming to an incompletely-optimised solution for this purpose, which we can define as not choosing the most

representative item set. Instead, we can work backwards to identify the most representative item set by brute force: we can generate sum scores for every possible trio of items, and compare them to the sum scores for the long scale. The top-correlating item set can then be chosen from this list. While this method is computationally heavier, it has the advantage of sidestepping the question of factor structure, agnostically identifying the item set that best predicts its scores.

Current Study

The current study develops a new short scale to maximally preserve the content validity of the 20-item R-UCLA, and examines whether the construct of loneliness is better represented by a unidimensional measure (e.g. the TILS) or a multidimensional measure (e.g. the R-UCLA).

We carefully consider the recommendations set forward by Goetz and colleagues (2013) for shortening scales, who emphasise clarity on the objectives, methods, and reasoning, as well as preservation of the original scale, and validation in a second sample (Table 1). Using data from the UK touch test (N = 19,521; Bowling et al., 2023) we aimed to maximally preserve the content of the original scale. With no consensus on the 'true' structure of the UCLA, we additionally use exploratory factor analyses (EFA) to investigate the factors underlying the R-UCLA.

A high correlation between the shortened scale and the original full scale offers evidence the shortened scale still reflects the theory behind and maintains content validity. It also ensures the new short scale will produce similar outcomes and predictions as the full version (Smith et al., 2000). While a

three-item solution is sought to provide a direct, functionally equivalent alternative to the widely-used TILS, other scale lengths are also considered, balancing between brevity and fidelity (Gorsuch & McPherson, 1989).

After creating a new shorter version, we collected new data to assess its convergent and discriminant validity with other loneliness and social support measures, and compared it to the TILS.

Table 1. Responses to scale shortening recommendations

Recommendation for scale shortening (Goetz et al., 2013)	Action
Clarity over the problem and objectives	*We have set out the unmet need in the literature, as well as our specific aims in this paper*
Consideration of the conceptual model	*We include a discussion of the UCLA's structure, and considerations in relation to scale shortening*
Preservation of the content validity	*This is the premise of this paper: does the TILS optimally preserve the UCLA's content validity in three items? If not, how can it be better preserved?*
Preservation of psychometric properties	*The UCLA's psychometric properties have been well-validated, and we will add no new items*
Documentation of reasons for item selection	*We will employ a simple pre-defined brute-force strategy to select our final item set*
Validation of the short scale in an independent sample	*We will validate our scale in a separate dataset, allowing us to measure the relationship between our scale and others*

Methods – Study 1

To create a maximally-representative short proxy for the R-UCLA, we needed a method that could instead preserve the multidimensionality of its structure, whatever that structure might be. We therefore employed an exhaustive combinatorial analysis to test every possible item trio for its representativeness of the full 20-item scale's variance. This approach systematically identifies the closest item set directly and by brute force, rather than deriving it via theory. This bypasses uncertainty relating to the UCLA's structure, ensuring our new short-form scale is a fully optimised reflection of its parent – not just one of its parts. We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study.

Sample

Data for the current study were obtained from The Touch Test (Bowling et al., 2023) via an online survey on attitudes toward touch, conducted between the 20th of January, 2020, and the 31st of March, 2020. The study was supported by BBC and Wellcome Collection. Participants were required to be 18 years or older, were recruited through BBC broadcasts and other media channels, and received no monetary incentives for participation. All participants provided informed consent prior to participation and were debriefed after completing the survey (Bowling et al., 2024).

The sample comprised 21,589 people (5,506 men, 16,083 women; ages 18–94, M = 56.67; Mdn = 59; SD = 14.33). Data is freely available from the UK Data Service (Bowling et al., 2023).

Measures

The R-UCLA is a 20-item scale, the second edition in the UCLA series and the most widely-cited version (Russell et al., 1980). Participants read statements closely relating to loneliness and responded on a Likert scale ranging from 1 ("Never") to 4 ("Often"). The original paper developed the TILS from analysis of the R-UCLA. Items were reverse-scored where appropriate. We reconstruct the TILS (Hughes et al., 2004) using items 2, 11 and 14 from the R-UCLA, along with the ULS-4 (Russell et al., 1980) and the eight-item UCLA Loneliness Scale (ULS-8; Hays & DiMatteo, 1987; Table 2).

Analyses

To examine the structure of the UCLA, parallel analysis was first used. EFA was carried out using oblique 'promax' rotation from the 'psych' package in R (Revelle, 2018; Team, 2021).

To identify the optimum item trio, we developed an exhaustive combinatorial analysis, designed to identify the item subset with the maximum correlation to the total scale score. We describe this process in full detail elsewhere (Maher, 2025). Our core item set comprised three final items, but this process was used to generate supplementary scales of lengths from one to six items, for researchers who require more brevity, or higher accuracy (Table S2). In the creation of the R-UCLA (Russell et al., 1980) the authors used a similar 'optimal subset regression procedures' to select the items most predictive of a direct loneliness measure to reduce the scale's 20 items to 4, creating the UCLA Loneliness Scale-4 (ULS-4). However, this was based on a sample of 162, and the process did not use sum scores, the

method by which the UCLA scores are usually counted. We also assessed construct correlations after adjusting for scale overlap, using scoreOverlap from the psych package (Revelle, 2018).

Transparency and Openness

Data were analyzed using R (R Core Team, 2021). The UK Touch Test dataset is available publicly (https://reshare.ukdataservice.ac.uk/854471/) and our own data is available on OSF, along with all code sufficient to replicate our analyses (https://osf.io/uqnt5/). This study was not preregistered.

Results - Study 1

Using parallel analysis to identify the structure of the R-UCLA yielded conflicting results, with results showing some support for one-, three-, and six-dimensional solutions, depending on the criterion and whether factor analysis or principal component analysis was used (Figure S1). While we found three factors with eigenvalues above 1 and above random expectation using principal component analysis, using factor analysis only one factor had an eigenvalue of more than 1.0, and six factors exceeded random expectation; in the scree plot there was also a visible cliff between the third and fourth factors (Figure S1). A one factor solution had poor fit ($\chi^2(170, N = 21{,}589) = 40{,}861.83$, $p = < .001$; $RMSEA = 0.11$; $TLI = 0.81$) and appears to incompletely represent the total variance captured by the scale. A three factor solution had good fit ($\chi^2(133, N = 21{,}589) = 13{,}313.15$, $p = < .001$; $RMSEA = 0.07$; $TLI = 0.92$; Table S1). We elected to force a three-factor solution, the most widely-accepted (although debated) solution for the UCLA structure (Maes et al., 2022). When we did so, item loadings were highly similar to those reported by Hawkley and colleagues (2005), replicating their three-factor structure almost exactly (Table S1). Our conflicting findings indicate the need for an agnostic approach to scale shortening.

To shorten the R-UCLA, we used a brute force approach to systematically identify the item trio that had the highest R^2 with the full R-UCLA sum score. Out of 1,140 unique item trios, the set with the highest predictive power reached an R^2 of .85 ($r = .92$) and comprised items 6, 14 and 20 ('I have a lot in common with the people around me', 'I feel isolated from others', 'There are people I can turn to',

respectively). This trio (the UCLA-3.5) comprised the top-loading item from each factor in our three-factor solution (Table S1). This trio's relationship with the R-UCLA was also essentially unchanged across 18–30, 30–49, 50–69, and 70+ age groups (R^2s = .83–.85).

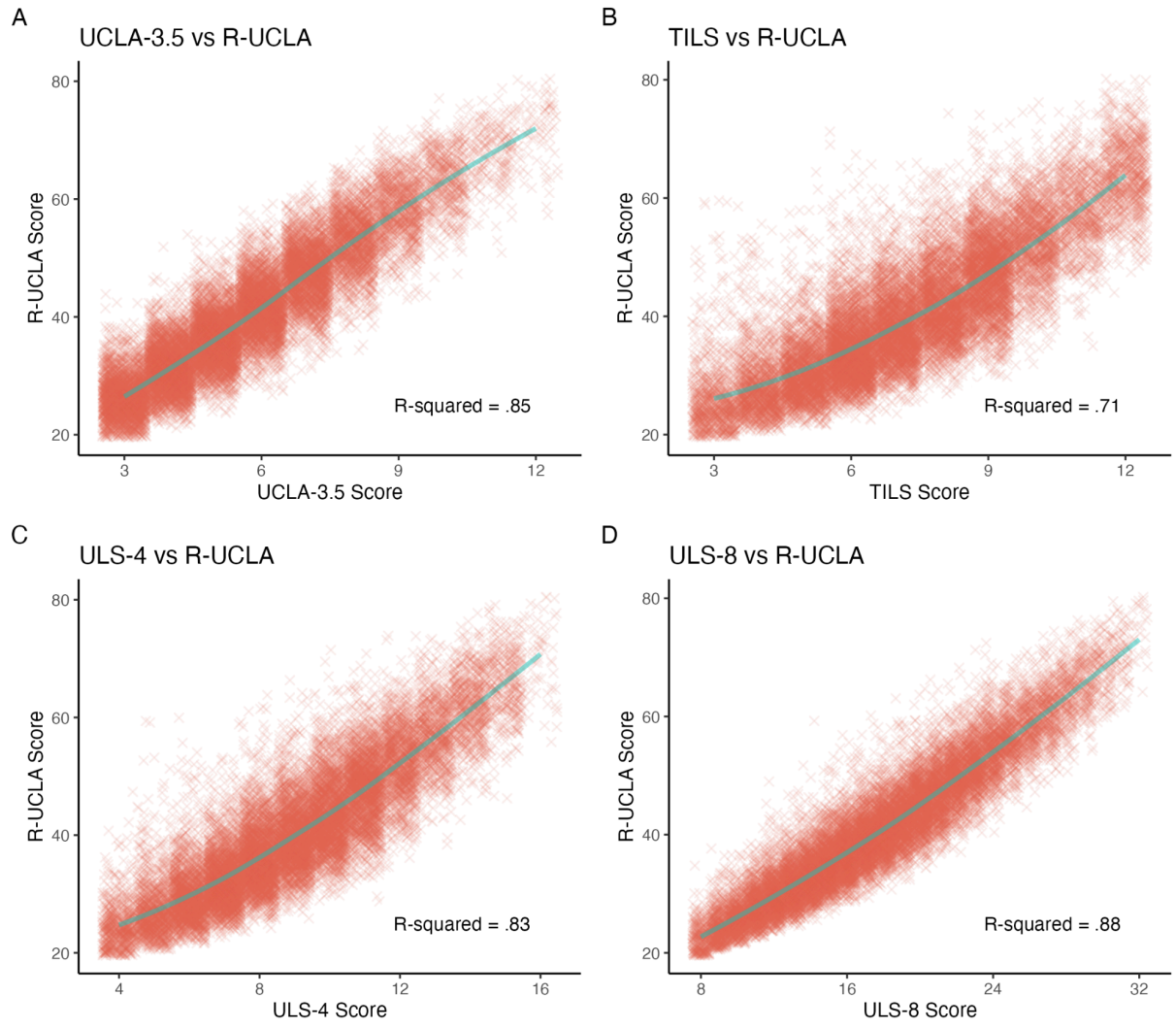
The UCLA-3.5 significantly outperformed the TILS in representing the parent scale, explaining 14 percentage points more variance (R^2 = .85 vs. .71). It surpassed the 4-item ULS-4 (R^2 = .83) and nearly matched the predictive power of the 8-item ULS-8 (R^2 = .88), indicating its efficiency and fidelity (Table 2). We show similar findings after accounting for the overlap between the short and original versions (Table 2).

Table 2. R-UCLA items and their inclusion in the TILS, ULS-4, ULS-8, and UCLA-3.5

	Item	R-UCLA	UCLA-3.5 (2024)	TILS (2004)	ULS-4 (1980)	ULS-8 (1987)
R-	1	I feel in tune with the people around me.			■	
	2	I lack companionship.		■		■
	3	There is no one I can turn to.				■
R-	4	I do not feel alone.				
R-	5	I feel part of a group of friends.				
R-	6	I have a lot in common with the people around me.	■			
	7	I am no longer close to anyone.				
	8	My interests and ideas are not shared by those around me.				
R-	9	I am an outgoing person.				■
R-	10	There are people I feel close to.				
	11	I feel left out.		■		■
	12	My social relationships are superficial.				
	13	No one really knows me well.			■	
	14	I feel isolated from others.	■	■		■
R-	15	I can find companionship when I want it.			■	■
R-	16	There are people who really understand me.				
	17	I am unhappy being so withdrawn.				■
	18	People are around me but not with me.			■	■
R-	19	There are people I can talk to.				
R-	20	There are people I can turn to.	■			
					R^2	
		R^2 with whole R-UCLA	**.85**	**.71**	**.83**	**.88**
		R^2 adjusted for scale overlap*	**.70**	**.59**	**.69**	**.78**

Note. Shaded boxes indicate respective inclusion in each short scale. * Calculated using scoreOverlap from the 'psych' package. TILS = Three-Item Loneliness Scale; ULS-4/8 = 4/8-item UCLA Loneliness Scale.

Figure 1. Scatterplots of the R-UCLA's relationships with related short scales



Note. Scatterplots visualising the relationship between the R-UCLA and the UCLA-3.5, TILS, ULS-4 and ULS-8. Note the tighter fit and more linear relationship for the UCLA-3.5 (Panel A) compared to the TILS (Panel B). TILS = Three-Item Loneliness Scale; ULS-4/8 = 4/8-item UCLA Loneliness Scale.

Shorter and longer item sets

We repeated this process for different item sets ranging from one to six items (Table S2). While the point of short-scales is to maximise efficiency, we were interested to see whether three items remained the optimal number of items, balancing brevity with predictiveness.

The most-predictive four-item set was of items 3, 6, 14 and 20. In this case, the optimal four-item set is simply the three-item set, but with item 3 added – simply the positive wording of item 20. However, the improvement in R^2 from adding a fourth item is .03 (R^2 = .88), and it appears that little relevant unique information is being added by lengthening the scale with another item. On the other hand, reducing the scale to two items results in a drop in R^2 of .05 (R^2 = .80). While a two- or four-item set would also be an effective measure, we suggest that our three-item set is a good balance of brevity and accuracy when measuring broad feelings of loneliness with a short scale. See Table S2 for the optimised sets for scales of length one to six items.

These findings indicate that the UCLA-3.5 is a more accurate representation of the R-UCLA than the TILS is. We will now discuss the implications of these results in the broader context of loneliness measurement.

Discussion

The current work underscores the need for an updated short version of the UCLA, in line with previous calls for the improvement of loneliness assessment tools (Maes et al., 2022; Mund et al., 2024).

We find firstly that our dataset shows a remarkably similar structure (Table S1) to that of Hawkley and colleagues (2005), replicating their findings. In this dataset, we demonstrated that while the TILS (Hughes et al., 2004) reliably predicts R-UCLA scores, its design, focusing solely on emotional loneliness, does not (and was not designed to) preserve the full content validity of the original scale. Using a brute-force item selection strategy on a large sample, we identified an item trio (items 6, 14, and 20) that predicts 85% of the variance in R-UCLA sum scores (higher than any other trio, than the ULS-4, and nearly as high as the ULS-8 with 5 fewer items), in a sample of over 21,000 participants (Table 2).

Conveniently, these items represent the top-loading items from each of the factors in both our (Table S1) factor analysis and that of Hawkley and colleagues (2005). In contrast, the TILS items (2, 11, 14) are the three top-loading items from factor 2 (Table S1). The UCLA-3.5, like its parent scale, is as such best-characterised as three-dimensional.

The UCLA-3.5 also saw the smallest decreases in its predictiveness when shared items were accounted for (Table 2). This may be indicative that the UCLA-3.5's predictiveness of the R-UCLA is less inflated

by error or idiosyncrasy than other short measures. The UCLA-3.5 also captures a more even balance of loneliness and social disconnection than the TILS. This increase in predictive power and balance is crucial, allowing researchers to use a short scale that is highly consistent with the R-UCLA, the most popular loneliness scale, saving time and resources.

As stated above, we found contrasting results over the structure of the R-UCLA, a matter which has provoked extensive debate (for a summary, see: Maes et al., 2022). We find some support for one-, three- and six-dimensional structures. A one factor solution does not however appear sufficient to fully describe the R-UCLA (Table S1). Broadly, a three-factor solution is the best-supported structure for the UCLA (Austin, 1983; Dussault et al., 2009; Hawkley et al., 2005; Hughes et al., 2004; Shevlin et al., 2015). When we forced a three-factor solution, factor 1 appears to capture social support; factor 2 appears to capture feelings of loneliness or isolation; while factor 3 appears to capture having community (Table S1), replicating previous findings (Dussault et al., 2009; Hawkley et al., 2005).

Our conflicting results in examining the UCLA's structure are likely a consequence of factor analyses' omission during the scale's original construction (Russell et al., 1978). This has also likely led to the confusion over what the UCLA represents: the literature has never reached true consensus over the number of factors (Maes et al., 2022), let alone their make-up. Dimensions cannot be separated without agreement over what they are, and thus the UCLA was considered unidimensional, despite an abundance of evidence suggesting otherwise (Maes et al., 2022).

Methods – Study 2

In Study 1 we created a short proxy for the R-UCLA. In Study 2, we sought to empirically test the core theoretical argument: that the R-UCLA's composite nature represents a conflation of two distinct constructs – emotional loneliness and social disconnection. We assessed the UCLA-3.5's discriminant and convergent validity with respect to other popular measures of loneliness and social support. Standard single-rater correlations are useful but not sufficient for this task, as noise and bias can (respectively) artificially deflate and inflate the associations between distinct constructs (Mõttus et al., 2024). To overcome this, we used a multi-rater design to calculate 'true correlations'—estimates of the relationships between constructs free from both random error and rater-specific biases. This allowed us to definitively map the conceptual space occupied by our new UCLA-3.5, compared to the TILS, demonstrating their differing alignment with narrow measures of emotional loneliness (as opposed to social support).

Sample

To determine the convergence and discriminant validity of the UCLA-3.5 with existing measures of loneliness and social support, we recruited pairs of participants from Prolific. For each dyad, Person A completed the survey on their own behalf and on behalf of their partner by providing the partner's ID, while Person B subsequently completed the survey for themselves and for Person A. To detect dyads who did not know one another, we asked Person B to state Person A's age and excluded any dyad with a

discrepancy greater than 2 years. Ten to fourteen days later, a follow-up survey was administered to Person A only to assess test-retest reliability.

The final sample of dyads comprised 352 people, (161 men, 188 women, 3 non-binary; ages 18–77, *M* = 32.11; *Mdn* = 29; *SD* = 10.75; 58% romantic partners, 30% friends, 12% family). The retest sample comprised 156 participants (65 men, 89 women, 2 non-binary; ages 19–77, *M* = 32.13; *Mdn* = 29; *SD* = 10.84).

Measures

We administered the UCLA-3.5 alongside the original TILS (Hughes et al., 2004). Additionally, we included the DJG (De Jong Gierveld & Van Tilburg, 2010) including its two subscales: Emotional loneliness (DJG-E; e.g. "I experience a general sense of emptiness":), and the Social Loneliness subscale (DJG-S; example item: "There are many people I can trust completely"). The overall form of the DJG has been described as comparable to the UCLA (Thompson & Pollet, 2023; Van Tilburg, 2020) as well as distinct (Penning et al., 2014), with no clear conclusion. Participants also completed the Oslo Social Support Scale (OSSS-3; e.g., "How easy is it to get practical help from neighbours if you should need it?"; Kocalevent et al., 2018), and a one-item direct measure of lonely feelings (1iL; "I often feel lonely"; Maher et al., 2025; Thompson & Pollet, 2023). All scales except the OSSS-3 were assessed on a 6-point Likert scale, ranging from 1 ("Strongly Disagree") to 6 ("Strongly Agree"). The OSSS-3 was scored according to the rubric described by its authors (Kocalevent et al., 2018).

Analyses

We first assessed item reliability and validity. Test-retest reliability (r_{tt}) was calculated as the correlation between Person A's scores at time 1 and time 2, while cross-rater agreement (r_{CRA}) was determined by correlating self-rated scores with informant-rated scores.

The 1iL is of particular usefulness in determining whether a scale is a 'pure' or 'true' loneliness scale; however, direct measures are often believed to induce higher levels of bias. This can be addressed using multi-rater analyses (Dragostinov et al., 2025; Maher et al., 2024; Mõttus et al., 2024). To estimate the associations between variables, alongside raw correlations in the self- and informant-rated datasets, we also computed 'true correlations' (as well as their standard errors) following the methodology described in detail by Mõttus and colleagues (2024). This approach to error correction takes the ratio of the cross-rater cross-variable correlations to the cross-rater same-variable correlations to derive the 'true' correlation estimates. This ratio represents an estimate adjusted for sources of noise like misclicks and inaccurate assessment, which are embedded in cross-rater agreement. However, because no within-rater correlations are used to compute these estimates, the effects of rater bias are circumvented. These true correlations are thus free from both noise and bias: in a sample of over 20,000 individuals, this method identifies a true correlation of -.97 between the items "I keep my promises" and "I break my promises" (Maher et al., 2024). We calculated true correlations among all the selected constructs of interest, as well as their items.

Results – Study 2

Test–Retest Reliability and Cross-Rater Agreement

Results indicated moderate retest reliability across items (r_{tt} = .47–.66), while across the scale level, r_{tt} was .68 for the UCLA-3.5, compared to .72 for the TILS. Item cross-rater agreements ranged from .17 to .43. For the summed UCLA-3.5 scale, r_{CRA} was .37, versus .47 for the TILS (Table 3).

Overall, the UCLA-3.5 demonstrated retest-reliability comparable to the TILS at both the item and scale level, suggesting participant responses do not contain significantly more occasion-specific noise or bias with the UCLA-3.5 than the TILS.

Table 3. Retest reliability and cross-rater agreement for TILS/UCLA-3.5 items and whole scales, sum-scored

	Item level	r_{tt}	r_{CRA}
TILS-1	I lack companionship.	.47	.33
TILS-2	I feel left out.	.66	.38
TILS-3/ UCLA-3.5-1	I feel isolated from others.	.59	.43
UCLA-3.5-2	I have a lot in common with the people around me.	.58	.21
UCLA-3.5-3	There are people I can turn to.	.49	.17
	Scale level	r_{tt}	r_{CRA}
	UCLA-3.5	.68	.37
	TILS	.72	.47

Note. TILS = Three-Item Loneliness Scale (2004).

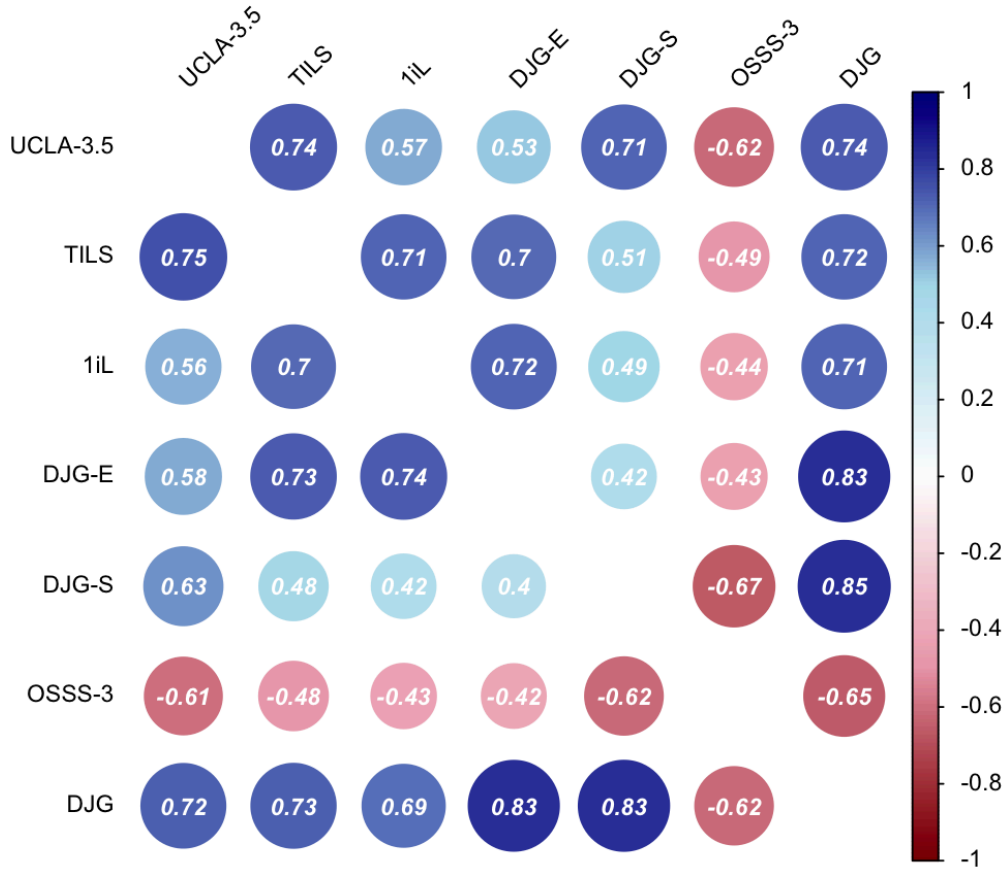
We then calculated the single-rater (Table 4) and true (multi-rater-adjusted; Table 5) correlations between all measures. In our central findings, the TILS showed a near-perfect correlation with the 1iL (r_{true} = .97), indicating it as a pure, narrow measure of loneliness. In contrast, the UCLA-3.5 was strongly, but more evenly, correlated with measures of both pure loneliness (r_{true} = .82) and social support (r_{true} = -.84), confirming it mirrors the multidimensional nature of its parent R-UCLA (Table 5).

In our single-rater analyses, there were few differences between the self- and informant-rated construct correlations. These estimates were lower than our true correlation estimates, but formed a similar pattern (Table 4). The UCLA-3.5 had relatively balanced correlation with the 1iL (r = .57) and OSSS-3 (r = –.61), while the TILS was more strongly correlated with the 1iL (r = .71).

Item-level analyses showed that the TILS items were more similar to one another than were the UCLA-3.5 items. TILS items correlated closely with the 1iL (r_{true}s = .84 to .99). The two items unique to the UCLA-3.5 were notably much more strongly related to the OSSS-3 (r = -.91 and -.81) than to the 1iL (r = .49 and .45). These results are reported in the supplementary materials (Figs. S2 & S3).

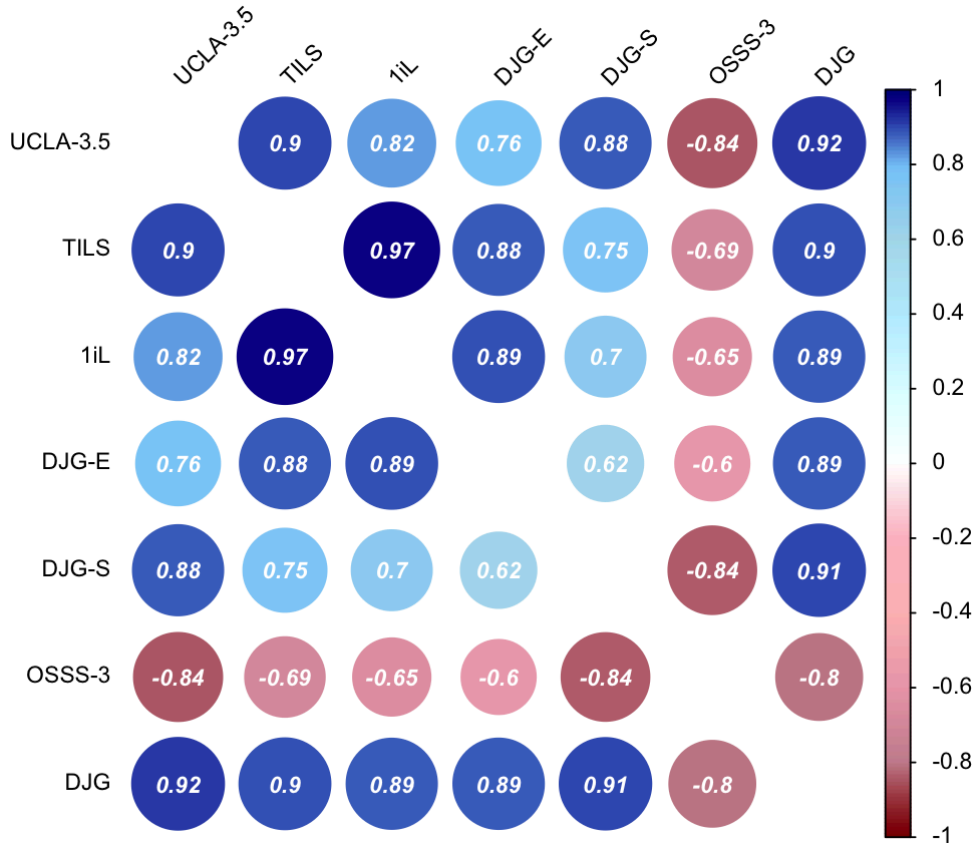
These results indicate that the UCLA-3.5 is a reliable measure, which is more balanced than the TILS, relating closely to a broader range of scales for loneliness and social disconnection.

Table 4. Single-rater correlation matrix of all included measures



Note. Self-report correlations shown below the diagonal, informant-report correlations shown above (N = 352). 1iL = One-item Loneliness Scale; DJG = De Jong Gierveld; DJG-S = De Jong Gierveld social loneliness; DJG-E De Jong Gierveld emotional loneliness; OSSS-3 = Oslo Social Support Scale-3; TILS = Three-Item Loneliness Scale (2004).

Table 5. True correlation matrix of all included measures



Note. Numbers below the diagonal represent true correlations ($N = 352$). Numbers above the diagonal represent Standard Errors. The matrix shows the TILS's strong alignment with pure loneliness measures (e.g. the 1iL) and the UCLA-3.5's more balanced profile across both loneliness and social support constructs (e.g. the OSSS-3). 1iL = One-item Loneliness Scale; DJG = De Jong Gierveld; DJG-S = De Jong Gierveld social loneliness; DJG-E De Jong Gierveld emotional loneliness; OSSS-3 = Oslo Social Support Scale-3; TILS = Three-Item Loneliness Scale (2004).

Discussion

Analyses strongly supported a unidimensional conceptualisation of loneliness, well-represented both by direct measures (e.g. the 1iL) and indirect ones (e.g. the DJG-E and TILS). Multidimensional scales like the DJG or UCLA-3.5 appear to capture an even balance of loneliness and disconnectedness before (Table 4) and after (Table 5) adjusting for measurement error.

The UCLA-3.5 displayed good overall test–retest reliability (r_{tt} = .68), comparable to that of the TILS (r_{tt} = .72). Cross-rater agreement was slightly lower for the UCLA-3.5 (r_{CRA} = .37) than for the TILS (r_{CRA} = .47), suggesting perceptions of community and social support could be more difficult for informants to assess than explicit expressions of loneliness (Table 3), further evidence that the two scales are indeed evaluating separate categories of constructs.

The error-corrected true correlation analyses highlighted the distinct profiles of the UCLA-3.5 and TILS. Despite their strong overlap with one another, the UCLA-3.5 captured a broader, more generalised construct of perceived isolation, with a narrower range of correlations with other loneliness constructs than the TILS (Table 5). Its slight lean towards measures relating to the social environment (the DJG-S and OSSS-3) over emotions of/relating to loneliness (the DJG-E and 1iL) can also be understood better in the context of a three-factor solution to the UCLA, in which one factor is feelings of loneliness, one is having community or a group of friends, and one is social support. When forcibly broken down, the UCLA itself thus appears to lean slightly towards the social environment over capturing lonely emotions, and the UCLA-3.5 follows suit (Table S1).

A conceptualisation of loneliness built on the UCLA has thus inflated the apparent link between loneliness and e.g. social support. Where the UCLA-3.5 shares a -.61 (unadjusted) correlation with the OSSS-3, as opposed to the TILS's -.48 or the 1iL's -.43 (Table 4).

Because the UCLA-3.5 happens to be constructed from the top-loading item from each of the UCLA's three factors (Table S1; Hawkley et al., 2005), from these data we can also better characterise what the full UCLA captures. While one of the UCLA-3.5's items – the one it shares with the TILS – correlates nearly perfectly with a direct loneliness measure and much more weakly with a social support measure, the reverse is true for the remaining two items. Only one of the UCLA's three factors assesses loneliness, while the other two appear to capture variance that is related to loneliness but distinct: having community and feelings of support (Figs. S2 & S3).

In the multi-rater analyses, the UCLA-3.5 was also nearly identical to the DJG (Table 5). Any genuine differences between these two popular scales may be caused – or at least heavily exaggerated – by sources of error like misclicks, idiosyncratic item interpretation, and inaccurate assessment. Similarly to the UCLA-3.5, the DJG may in fact comprise just one loneliness factor (the DJG-E) alongside one non-loneliness factor (the DJG-S). This has been investigated further elsewhere (Maher et al., 2025). Collectively, our data is consistent with the UCLA-3.5, like the long UCLA scales, being a balanced measure of both lonely feelings and social disconnection, while the TILS is more aligned towards lonely feelings.

General Discussion

Our findings confirm an important issue in loneliness measurement: the R-UCLA and its proxy, the TILS – often incorrectly referred to as a '3-Item UCLA Loneliness Scale' – are not interchangeable. Loneliness appears to be unidimensional, accurately represented by the TILS. The R-UCLA is in fact a composite scale, assessing both the emotion of loneliness and a lack of social connections, together (Figure S3). This is suggested by our factor analysis (Table S1), but is demonstrated most clearly by its error-corrected associations with other scales (Table 5). This has inflated the apparent link between loneliness and, for example, social support (Table 4).

Our new scale, the UCLA-3.5, is valid, reliable, and an accurate 3-item representation of the original UCLA scales. The UCLA-3.5 captures a balance of loneliness and social disconnection, and can be considered three-dimensional, containing one item each to represent emotional loneliness ("I often feel isolated"), having community ("I have a lot in common with the people around me"), and social support ("There are people I can turn to"), the three factors that make up the UCLA (Table S1; Hawkley et al., 2005). The scale provides researchers with an efficient tool for measuring loneliness and social disconnection, ensuring better representation of the original UCLA in fewer items.

A composite loneliness-disconnection scale has utility in loneliness research. Where narrow measures of loneliness identify those experiencing lonely feelings, the R-UCLA and UCLA-3.5 identify people who are both feeling lonely and lacking social connectedness. This may represent the group of people

for whom a social intervention may be more effective, separating them from those who feel lonely without tangible cause, and those who feel disconnected but are relatively content.

Conceptual Implications for Loneliness

One of the key questions raised by the inherent difference between the TILS and the UCLA scales is which one (if either) is the 'true' representation of loneliness. In our multi-rater analyses (adjusted for both noise and biased responding) we show that they are not one and the same, with the UCLA-3.5 straddling feelings of loneliness and social support. In comparison, the TILS appears to be a pure loneliness measure (Table 5). This pattern is also visible at the item level (Figure S3).

The UCLA scales, despite being a central touchpoint in loneliness research, are not pure loneliness scales. Instead they bundle loneliness (an emotion or affect) and lack of connection (an assessment of a social network), two constructs which appear to be measurably distinct. De Jong Gierveld and Van Tilburg (2010) have already shown that two such factors are identifiable as separate, although the authors have categorised both factors as equal parts of loneliness. After addressing noise and bias, we find the DJG and UCLA-3.5 to be near-identical (r_{true} = .92; Table 5) with its two subscales appearing to assess loneliness and social support respectively. This suggests that referring to both of these subscales as equal aspects of loneliness, and the overall scale as a loneliness scale, may be the same error made in the UCLA. However, more specific study is required to investigate this further.

The conceptualisation of the UCLA as unidimensional has muddied the field. It has likely inflated social support's link to the UCLA scales' construction of loneliness, in comparison to e.g. the TILS's construction of loneliness. But the conflation has also buried crucial information. For instance, one meta-analysis determined that emerging adults' levels of loneliness appear to have been rising in recent decades (Buecker et al., 2021). A vast majority of the studies had administered the UCLA, and understandably treated it as unidimensional. As a result, it is impossible to determine from this study whether the longitudinal increase they detected in scale scores was driven primarily by changes in lonely feelings, or by changes to people's social networks.

This was not inevitable. If the UCLA had been formally divided into sub-factors, and researchers had consistently reported subscale level results, the exact same data collection would instead have resulted in a much clearer understanding of how loneliness has changed in young people over the last few decades. To mitigate confusion, a short UCLA version is required that preserves this multidimensional information, rather than discarding it. This requires a different approach.

Optimal Scale Shortening Methods

The problem of reducing an item set while preserving validity is inherently dynamic. We stated above that a well-designed four-legged stool is not a three-legged stool with an added leg, and that when shortening scales, the best four-item solution need not share any of its items with the best three-item solution. This is demonstrated empirically by our findings (Table S2). Our approach addresses this, and sidesteps debates over the 'true' structure of the parent scale and focuses on preserving the

maximum proportion of its variance. We describe it in further detail elsewhere (Maher, 2025). In our case, our brute force method happened to select the top-loading item from each of the UCLA's three apparent factors; we note that this would not have been the case had we elected to create a scale of any other length (Table S2).

This R function ("reduceTo") can be applied to shorten any scale in any dataset to any size, view full-scale predictiveness values across item sets, and generate sum scores from a selected trio (Maher, 2025). It can be accessed within R using "devtools::install_github('paddycmaher/reduceTo')", ensuring 'devtools' is installed and loaded. Help on using the function can be accessed as usual, using "?reduceTo".

Recommendations

Given the long history and widespread use of these scales, researchers will rightly expect clear guidance. Based on our findings, we offer the following recommendations:

1. Where the principle reason for research is specifically an interest in the combination of loneliness and disconnection together, we recommend using broad measures such as the R-UCLA, the UCLA-3.5, or the DJG.
    1.1. However, we strongly recommend always reporting the dimension-level results wherever possible, regardless of study aims.

    1.2. We also strongly advise researchers using these scales to clarify explicitly that these scales are multidimensional, of which loneliness is just one.
2. For any research that is interested predominantly in loneliness, we recommend dedicated measures such as the TILS, the 1iL, or the DJG-E.
3. In cases where efficiency is prioritized and there is no specific interest in lonely feelings vs social disconnection, we recommend the UCLA-3.5.
4. In cases where research is following on from an existing line of scientific questioning where the UCLA has been in use, we recommend the UCLA-3.5.
5. Where specific lines of scientific inquiry have been built upon the TILS, we strongly encourage the continued use of the TILS.
6. For the purposes of meta-analysis, the long-form UCLA scales, the UCLA-3.5, the ULS-4, ULS-8, and the overall DJG can be considered generally comparable as joint measures of loneliness and social disconnection.

To minimise further confusion we strongly advise researchers to actively differentiate between the TILS and long-form UCLA scales in their work. Meta-analyses regularly combine results from the TILS and long-form UCLA scales together (Buecker et al., 2020; Holt-Lunstad et al., 2015). This miscategorisation can confound results, under- and over-estimating loneliness's relationships with other important variables and outcomes, and ultimately leading to a distorted conceptualisation of loneliness.

We provide a document in the supplementary materials (available at: https://osf.io/uqnt5/) outlining administration of the UCLA-3.5 and its different forms.

Limitations and future directions

Although we did not flag it as a cause for concern in the context of reliability or validity, there is notably lower cross-rater agreement between the UCLA-3.5 and TILS. This could have an impact on any studies involving informant-only assessment of loneliness. However, cross-rater agreement remained good at the scale level. While the same-sample correlations are a useful measure of whether the UCLA-3.5 and R-UCLA are interchangeable on a single occasion, we did not examine whether they act differently across longer periods of time. Future research should investigate whether their longitudinal relationships to other variables are also functionally identical. We relied on English-speaking samples, but the UCLA and its associated versions are used internationally. Further work should be done to determine whether the UCLA-3.5 is a useful representation of the R-UCLA for non English-speakers.

Conclusion

The R-UCLA and the TILS do not measure the same thing, yet are treated as equivalent, resulting in widespread confusion and generating misconceptions about what loneliness is. Our findings show that while the TILS is a pure measure of emotional loneliness, the R-UCLA is a composite measure, capturing not just lonely feelings but also the appraisal of one's social world; specifically the availability of community and support. The field's conflation of these separable constructs have resulted in decades of skewed research results, exaggerating for instance the strength of the link between loneliness and social support.

This paper sought to resolve this issue by creating a three-item proxy for the R-UCLA. Using a brute-force approach, we identified a trio of items, the UCLA-3.5, that represents the multidimensionality of its parent scale. It is a reliable, valid, and efficient tool for researchers who require a short scale that is genuinely interchangeable with the R-UCLA. By providing this tool, and by clarifying the distinct nature of what these scales measure, we hope to untangle a long-standing confusion in the literature. A more precise understanding of our measures is the next step towards a more precise understanding of loneliness itself.

Ethical Approval

Ethics for our primary data collection was approved by Goldsmiths, University of London (approval number: PS170724PMS).

Data Availability

The UK Touch Test dataset is available from the UK Data Service at: https://reshare.ukdataservice.ac.uk/854471/. All R scripts required to analyse these data and reproduce our results are available from OSF, at: https://osf.io/uqnt5/.

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