Student Loneliness: The Role of Social Media Through Life Transitions

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A B S T R A C T

The move to university can be difficult for students- a transition often characterised by a risk of loneliness and poor mental health. Previous work highlights the important role social media can play in this transition. We report findings from a large-scale survey of 510 first year undergraduates across the UK, identifying factors that predict student loneliness, and exploring their social media use. Higher levels of social capital, induction satisfaction, and sense of community are significantly associated with lower levels of loneliness. Conversely, those reporting a more 'liminal self' - the desire to edit and reinvent yourself online - experience greater loneliness- with an indirect relationship between online social information seeking and loneliness, through social capital. We surmise that being 'true to yourself' online is important when starting university, and that social media can be a useful tool in facilitating offline relationships and maintaining ties to old friends.

1. Introduction

1.1. Transition to university

Transition has been defined as 'the capability to navigate change' (Gale & Parker, 2014), recognising that transition as both the process of change over time and the resources required to engage with that change. One instance in early adulthood whereby transition might first be experienced is beginning university. Although the ways in which students experience this transition will vary, it has been suggested that the change from a familiar environment into an unfamiliar one represents a period of disequilibrium (Jackson, 2003). Much research on university transition has been focused on the first year (Chow & Healey, 2008; Ferguson et al., 2016; Pokorny, Holley, & Kane, 2017; Stirling, 2016; Thomas, Briggs, Hart, & Kerrigan, 2017). Here the scale of change is greatest and spans many aspects of the individual's life.

Successful transition into university is crucial for wellbeing. When students move to university, sometimes abroad, they are not only separated from close relationships, but also from established social networks and support systems (Rokach, 1989). Oswald and Clark (2003) estimate that approximately 41% of school friendships become more distant during the first semester of university life. Maunder, Cunliffe, Galvin, Mjali, and Rogers (2013) found that a key challenge in the transition to university for students was the formation of new peer groups, with this social positioning being a key factor in how they establish their identity in an unfamiliar

context. Indeed, these friendships are deeper than those formed in earlier life, may replace the support of family, and are critical to university life- with students reporting that it was these social bonds that reduced the likelihood of poor academic performance and even withdrawal from university (Brooks, 2007). In line with this, Buote et al. (2007) found the quality of new friendships formed during the first year of university was a significant predictor of successful adjustment to university both socially and academically, as well as attachment to the university itself.

We recognise that there has been a clear attempt to quantify the student transition by means of transitional models. Examples include the Bridges Transition Model (Bridges, 2009), the U-Curve Theory of Adjustment (Risquez, Moore, & Morley, 2007), the Model of Student Adjustment (Menzies & Baron, 2014), the Student Experience Model (Burnett, 2007), and the Model for Mapping the Formation of Student Identity (Briggs, Clark, & Hall, 2012). However, whilst these model account for the phases of student life, as well as social and psychological changes, none take into account the rich online experiences of students and their changing digital identities.

Given the importance of forming new social relationships in the transition to university, it is unsurprising that many studies have established that the failure to form such bonds has negative consequences for both the students' mental health and their academic success. Mental health problems are highly prevalent in university student populations, particularly for those in the transition from secondary to tertiary education (Musiat et al., 2018). In part, this can be explained by new stressors: leaving home for the first time, making new friends, and facing academic hurdles. In comparison to non-studying individuals of the same age, university students have been found to be more likely to experience emotional problems (Hunt & Eisenberg, 2010). Loneliness has been shown to be a strong predictor of depression and anxiety (Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006; Richardson, Elliott, Roberts, & Jansen, 2017), may negatively affect academic performance as well as social adjustment to the new university environment (Wohn & Larose, 2014), and has been identified as an important factor predicting university dropout (Ali & Gregg Kohun, 2017; Kelly, Kendrick, Newgent, & Lucas, 2007; Rotenberg & Morrison, 1993). The term 'transient loneliness' (Lawson, Vines, Wilson, Barnett, & Barreto, 2014) has been applied in this context, drawing similarities between populations which at first seem quite diverse, but actually share some of the same experiences- migrant workers and students moving to university.

Adolescents and young adults have been shown to be particularly vulnerable to the negative consequences of loneliness (Danneel, Maes, Vanhalst, Bijttebier, & Goossens, 2018). A survey in the UK found that 34% of students aged 18–24 felt lonely to some degree (YouGov, 2016). These feelings of social isolation and loneliness have been highlighted as one of the drivers of poor mental health in higher education (StudentMinds, 2014). In 2015/16 more than 15,000 students disclosed mental health conditions to their university, a fivefold increase compared to 2006/07, with 94% of universities seeing an increase in the demand for counselling services (Thorley, 2017). Zivin, Eisenberg, Gollust, and Golberstein (2009) reported that more than a third of students have some form of mental health problem, with depression and eating disorders being the most prominent. As such, taking steps to reduce the risk of student loneliness is of paramount importance within universities.

1.2. Supporting transition into university life

In the context of higher education, several factors can predict mental well-being. A supportive academic environment, a sense of belonging, professional confidence and civic engagement are all associated with better mental health outcomes (Fink, 2014). Some of these predictors are achievable by becoming involved in university life; for example, being a member of a student club or joining a sports team decreases the likelihood of loneliness (Pijpers, 2017). Several authors have highlighted actions that can be taken by universities to facilitate social bonding, and therefore promote positive mental health and successful transition to university. Maunder et al. (2013) concluded that university actions which facilitate the formation of social relationships in the early stages of a degree are key to successful transition into university. In line with this, Davig and Spain (2005) discuss the crucial role of university induction in promoting integration into university life, with group activities and the opportunity to meet other students a key driver of successful induction.

Whilst the role of university induction is undeniably important, Gale and Parker (2014) identify alternative ways of conceptualising transition, particularly in higher educational contexts. They highlight that many researchers, policy-makers and practitioners focus heavily on actions that enable the student to conform to university requirements. However, this neglects the diverse nature of the student body. They propose that more focus should be placed on being flexible, responsive and inclusive when considering the student body. This student-centred approach would thus foster a connection between the university and the student, where students perceive the university to be relevant to their lives, and experience a sense of belonging. As such, a feeling of connection to the university may be an important predictor of successful transition. StudentMinds[1] recently created online guides for college students or those who have already started at university specifically aimed at improving transitions- by providing information about 'time management, relationships, identity, finances, sexual activity, mental illness, suicide and addictions and more'. Whilst this kind of information is undoubtedly useful to new students, it does little to support those crucial early relationships that can help establish a sense of community.

Social capital refers to both the resources that are accumulated through social relationships and the ability to draw on them for support (Coleman, 1988). Social capital has been shown to be related to improved employability (Batistic & Tymon, 2017) and positive mental health (Ho, 2016). Putnam (2000), in examining social isolation in contemporary society, proposed two distinct forms of social

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[1] https://www.studentminds.org.uk/transitions.html.

capital: bridging and bonding. Ellison, Steinfield, and Lampe (2007) define *bridging social capital* as loose connections between individuals, and in contrast *bonding social capital* refers to more emotionally close bonds. They observed that both bridging and bonding capital were predictive of satisfaction with university life and self-esteem in students. However, Ellison et al. introduce a third construct, referred to as *maintained social capital* which describes an individual's ability to maintain social networks when they are physically disrupted - in our university context, disruption from connections to friends at home. As shown already, feelings of loneliness are common in the transition to university, and an individual's capacity to maintain connections with old friends may be important for reducing such feelings. Ellison et al. observed that all three forms of social capital were intrinsically linked to social media usage, which provides a valuable tool in forming and maintaining social bonds. They argue that Facebook in particular has a range of features which encourage individuals to connect with people they would not have otherwise connected with ('latent ties'), therefore enhancing bridging social capital.

Park et al. (2015) emphasised the need to explore the link between mental health, well-being and online experiences, in an age where young people are spending increasing amounts of time online. Numerous accounts of the impact of social media use on well-being have emerged- some citing the value in engaging with peers online (Burke, Marlow, & Lento, 2010) as well as reports of social media negatively impacting social connectedness and heightening loneliness (Song et al., 2014). There have been clear indications of the benefits of using social media and its connection to social capital. For example, Gil de Zúñiga (2012) demonstrated that information-seeking via social network sites is a positive and significant predictor of people's social capital as well as civic and political participatory behaviours, both online and offline. Ellison, Steinfield, and Lampe (2011) examined this relationship further by investigating whether distinct patterns of social media behaviour can differentially predict types of social capital. They identified three distinct connection strategies used by Facebook users, '*Initiating*', which is the use of social media to meet new people; '*Maintaining*', which is the use of social media to maintain connections with existing friends, and '*Social information Seeking*' which is the use of social media to discover information about individuals that are known offline. They found that social information seeking was a strong predictor of both bridging and bonding social capital, concluding that social information seeking may allow users to learn information about individuals that can be used to facilitate offline interaction. It is possible that in periods of transition, social information seeking may serve to strengthen face-to-face relationships, and may in turn reduce loneliness.

Work has consistently demonstrated how social media offers the opportunity for social comparison (e.g. Haferkamp & Krämer, 2011), which we find may be detrimental to students. For example, Thomas et al. (2017) found that students experienced anxiety when given information about their new university life prior to moving away from home. In particular, knowing who they would be living with allowed students to engage in social information seeking, and search for soon-to-be housemates prior to arriving at university. This resulted in online social comparison - using social media to assess friendship likelihood. Students reported they pre-judged new acquaintances on the basis of their online profiles, a process that can result in false or inaccurate misconceptions (Tuch, Presslaber, Stöcklin, Opwis, & Bargas-Avila, 2012). Given the importance of social media in social-information seeking, the way students present themselves online may also play an important role in their experience of transition to university (Kerrigan & Hart, 2016).

It is clear that successful transition to university is a multidimensional processes, which involves both the activities in place to support students through transition (e.g. university induction, community-building activities), external information and resources (e. g. social media) and social factors (e.g. social capital, belonging). Successful transition to university is also a global issue, with enrolment in higher education rising steadily (UNESCO, 2017). In the UK alone there were 414,140 new students enrolling in higher education in 2019, which included over 34% of all 18 year olds (UCAS, 2019). The repercussions of unsuccessful integration into university can be damaging not only for the individual student, but also impact on peers, courses, and university life more broadly. In this study we explore the extent to which multiple factors predict loneliness in first year university students. Our research question, therefore, is 'What factors predict loneliness in first year university students?' We hypothesise that positive early university experiences, a sense of community and higher social capital will all contribute to reduced loneliness. We also predict that social media use may indirectly predict loneliness, through the enhancement of social capital.

2. Method

2.1. Participants

We collected data with the help of UK-based market research company YouthSight[2] in April 2017. YouthSight were chosen for their specialism in recruiting people under the age of 30, matching our target demographic of undergraduate students. We obtained 510 responses from current first year undergraduate students. We recruited 200 male and 310 female participants. The age of our participants was predominately 18–24 (476), with 24 aged 25-34, and a further 10 aged 35 or over. The majority of our participants (402) were surveyed 6–7 months after they started university. We requested students were studying in the UK only- 496 of our participants were studying in the UK, and 14 stated they were studying outside the UK. The majority of participants identified as being British (N = 253), in addition to other participants from wider Europe (N = 167), Africa (N = 9), Asia (N = 58), North America (N = 4), South America (N = 2), Australia (N = 1) and mixed nationality (N = 11). A further 5 did not provide a nationality.

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[2] https://www.youthsight.com/.

2.2. Survey design

We compiled a 125-item survey on Qualtrics. We collected information about demographics, use of social media, satisfaction with university, and 8 other previously published measures we felt would assess student experience in terms of connectedness and belonging, as well as providing a snapshot of social media use: the Revised UCLA Loneliness scale (Russell, Peplau, & Cutrona, 1980); the Three-Factor Psychological Sense of Community scale (Jason, Stevens, & Ram, 2015); the Bridging/bonding/maintained social capital & using Facebook to connect scale (Ellison et al., 2007), and the Bounded/liminal self scale (Kerrigan & Hart, 2016). Individual items ranged from 1 = strongly disagree to 5 = strongly agree and scales were constructed by taking a mean of the items (except social media intensity items, which required the computation of z-scores). Scale item information can be found in Appendix A.

2.2.1. Loneliness measure

The 20-item revised UCLA Loneliness scale (Russell et al., 1980) was used to assess loneliness. The scale includes items such as '*I feel left out*' and '*I lack companionship*'. Students were asked to respond in relation to the first six weeks of university, indicating the extent to which they had experienced these feelings on a scale of 1 (Never) to 4 (Often). Cronbach's alpha for the scale was 0.994.

2.2.2. Social capital measures

We used three social capital measures from Ellison et al. (2007). Bridging social capital refers to 'weak ties', or loose connections we have with people who typically do not provide emotional support, but may offer new perspectives (Granovetter, 1973). Bridging measures included statements such as '*I feel I am part of the university community*'. Bonding social capital, in contrast, is between people with a close emotional connection, such as family and friends. Bonding measures included statements such as '*There are several people at my university I trust to solve my problems*'. Finally, maintained social capital is defined by Ellison et al. as the ability to maintain valuable connections as one progresses through life changes. Maintained social capital measures included statements such as '*I'd be able to stay with a high school acquaintance if traveling to a different city*'. Cronbach's alpha for the three measures were 0.880, 0.732 and 0.858 respectively.

2.2.3. University measures

To measure experiences at university, we adopted the Three-Factor Psychological Sense of Community scale (PSC) (Jason et al., 2015) and created 8 satisfaction with induction items. The PSC is based on three domains: self (identity and importance to self), membership (social relationships), and entity (organisation and purpose). The self items included statements such as '*I made friends in this group*', membership items included statements such as '*Members could depend on each other in this group*', and entity items contained statements such as '*I think this group was a good group*'. To reflect the context of our study, item wording was changed, such that statements like '*Members could depend on each other in this group*' were changed to '*Students can depend on each other in this university*'. Jason et al. report that 'multiplicative scores might be more predictive' (p.981) than individual scores, therefore the three measures were combined into an overall factor model representing the total PSC score, with a Cronbach's alpha of .908.

As we see in the literature, induction is important for student wellbeing. Whilst a few scales exist which measure generalised satisfaction with university life, we could not find any well-cited established induction satisfaction scales in the psychological literature. As a result, we sought input from academic peers and created a scale of 8 items, which included statements such as '*I received a welcome pack to introduce me to the area*' and '*I felt knew who my course mates were*'. Cronbach's alpha was .744.

2.2.4. Social media use

Social media use was captured with items borrowed from Ellison et al. (2007) measuring *social media intensity*, and three aspects of social media use; *Initiating Friendships, Maintaining Friendships and Social Information Seeking* (see Ellison et al., 2011). The social media intensity scale reflected all social media, rather than a focus on Facebook found in Ellison's work. Items referred to the number of friends on social media, time spent on social media per day, and a series of Likert-scale attitudinal questions to understand how emotionally connected to social media the participants were. After computing z-scores to standardise across the measures, Cronbach's alpha was .751.

We included three *Social Information Seeking* items that measured whether participants used social media to look up someone with whom they shared some offline connection, such as a classmate. This measure included statements such as '*I use social media to learn more about other people in my classes*'. Cronbach's alpha for the items was .782. *Maintaining Friendships* constituted a single item ('*I use social media to keep in touch with my old friends*'), as did the *Initiating Friendships* construct ('*I use social media to meet new people*'), as per Ellison et al. (2007).

We also assessed to what extent people edited their social media profiles. We used items that reflected the constructs 'bounded self' (Boyd & Ellison, 2008) and 'liminal self' (Kerrigan & Hart, 2016). As social media platforms have different affordances and are used in different ways to communicate with different groups, the concept of the bounded self reflects the difficulty that people may have around maintaining a deliberate distinction between online selves- use of different social media for different selves may be the only way to remain bounded. Developed from a study which examined the use and perceptions of the affordances of different social media platforms, the bounded self scale consists of newly-developed statements such as '*I am completely comfortable with being open about myself on social media*' and '*I do not think twice about posting personal data on social media sites*'. Cronbach's alpha for the scale was 0.765. The liminal self scale captures the ideology around transition, neither being in one state or another-in the context of first year students, they are between the school leaver and university student spaces. Liminal items were focused on using social media to present who we are. The newly-developed scale consists of statements such as '*I like to edit or restrict access to old posts to reflect who I am now*' and '*I wish I*

could erase and reinvent my social media identity'. Cronbach's alpha for the scale was 0.614.

3. Results

3.1. Social media use

We asked participants to indicate which social media platforms they used, as well as which social media platform they preferred to use the most (see Fig. 1). The most preferred social media site as well as the most widely used, was Facebook. This information was used to form the basis of subsequent questions in our survey-if participants had stated they preferred to use X platform, they were asked to think of that platform when answering the social media intensity items.

3.2. Regression

We investigated the extent to which social capital (Maintained Social Capital, Bridging and Bonding), university factors (Sense of Community and Satisfaction with Induction) and social media use (Social Media Intensity, Bounded Self, Liminal Self, Off-to-Online and Online-to-Offline Friendships) predicted loneliness as reported by students. Table 1 shows the bivariate correlations between all variables. The full regression model is reported in Table 2. The regression model was able to account for 51.7% of the variance in reported loneliness during the first year of university ($R^2 = 0.517$, F (10,499) = 53.503, p < .001).

3.2.1. Social capital
As can be seen from Table 1, higher levels of Maintained Social Capital, Bridging and Bonding Capital were all significantly correlated with lower levels of loneliness. All three forms of social capital were significant negative predictors in the regression model (Table 2).

3.2.2. University factors
Greater Induction Satisfaction, and Sense of Community were both significantly associated with lower levels of loneliness and made a significant negative contribution to the regression model.

3.2.3. Social media
Whilst Social Media Intensity, Liminal Self and using social media for social information seeking were all negatively associated with loneliness in the bivariate correlations presented in Table 1, only Liminal Self was a negative predictor in the final model, with social information seeking being a positive predictor of loneliness.

As can be seen in Table 2, the relationship between social information seeking and loneliness, when considered alongside the other predictors is a positive predictor. Previous research has conceptualised a complex relationship between online behaviour and social capital, in particular the use of social media for social information seeking (Ellison et al., 2011). As such, we investigated the possibility
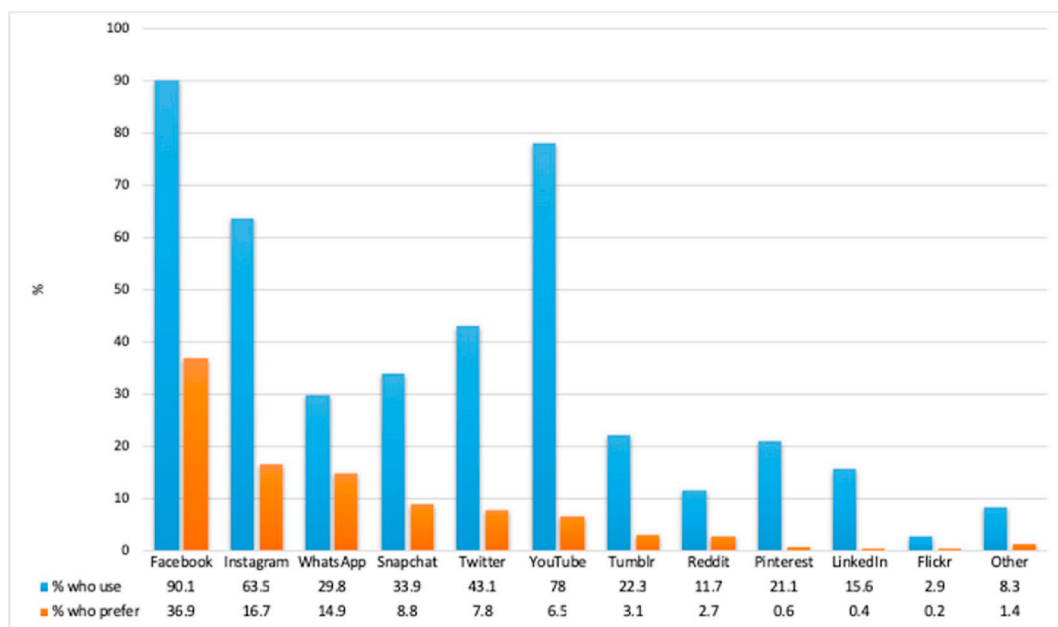

	Facebook	Instagram	WhatsApp	Snapchat	Twitter	YouTube	Tumblr	Reddit	Pinterest	LinkedIn	Flickr	Other
% who use	90.1	63.5	29.8	33.9	43.1	78	22.3	11.7	21.1	15.6	2.9	8.3
% who prefer	36.9	16.7	14.9	8.8	7.8	6.5	3.1	2.7	0.6	0.4	0.2	1.4

Fig. 1. Percentage of social media platform usage & preferred social media platform.

Table 1
Bivariate correlations and descriptive statistics for all variables (N = 510).

		1	2	3	4	5	6	7	8	9	10	11	12
1	Loneliness												
2	Maintained social capital	-.349**											
3	Bridging social capital	-.572**	.383**										
4	Bonding social capital	-.583**	.335**	.579**									
5	Sense of community	-.572**	.351**	.759**	.579**								
6	Induction satisfaction	-.577**	.346**	.603**	.561**	.607**							
7	Social media intensity	-.106*	.128**	.148**	.087*	.150**	.105*						
8	Unbounded self	-.063	.088*	.067	.066	.039	.069	.237**					
9	Liminal self	-.333**	.100*	.168**	.177**	.178**	.193**	.033	.118**				
10	Social media use: maintaining friendships	-.227	.385**	.291**	.198**	.218**	.343**	.257**	.050	.148**			
11	Social media use: Initiating friendships	-.056	.070	.091*	.071	.020	.042	.231**	.389**	-.035	.080		
12	Social information seeking	−189**	.263**	.325**	.271**	.248**	.322**	.297**	.200**	.054	.388**	.408**	
	Mean	2.46	3.47	3.62	3.33	3.92	3.50	0.00	2.34	3.24	4.13	2.72	3.53
	SD	0.70	0.85	0.65	0.70	0.67	0.57	0.60	0.76	0.64	0.91	1.14	0.90

Table 2
Regression model coefficients.

	Unstandardized Coefficients		Beta	R^2
	B	Std. Error		
(Constant)	6.106	.192		.518**
Maintained social capital	-.259	.052	-.213	*
Bridging social capital	-.155	.054	-.148	**
Bonding social capital	-.067	.030	-.082	**
Sense of community	-.152	.055	-.141	**
Induction satisfaction	-.249	.041	-.252	**
Social media intensity	-.020	.039	-.018	
Unbounded self	.021	.032	.023	
Liminal self	-.215	.035	-.197	**
Social media use: maintaining friendships	-.001	.028	-.002	
Social media use: Initiating friendships	-.033	.023	-.054	
Social information seeking	.062	.030	.081	*

**p < .01; *p < .05.

of an indirect relationship between social information seeking and loneliness, through social capital. A multiple mediation analysis, employing the PROCESS macro (Hayes, 2017) was conducted, resampling data 5000 times to construct 95% CIs for the indirect effects.

As can be seen in Fig. 2, the conditions for mediation were met as set out by Preacher and Kelley (2011) The analysis identified a significant indirect effect of social information seeking on loneliness, through social capital, $ab_{TOTAL} = -0.23$, CI [-0.31, -0.16], accounting for more than half of the total effect ($P_M = .58$). All mediators were significant in the model, with bridging capital accounting for the largest proportion of the effect (ab = 0.11, CI [-0.16, -0.07]), followed by bonding capital (ab = 0.10, CI [-15, -0.06]) and finally maintained social capital (ab = -0.03, CI [-0.06, -0.01]).

4. Discussion

Our research question was 'What factors predict loneliness in first year university students?' We aimed to predict loneliness in first year university students, assessing early university experiences, psychological, and behavioural constructs, and considering how these are manifested within a digital context for relationship building and maintenance. We found that higher levels of three kinds of social capital were associated with lower levels of loneliness. We also found that greater induction satisfaction, and sense of community at university were associated with lower levels of loneliness. In terms of social media usage, we found that those reporting a more 'liminal self' experienced more loneliness, and that social information seeking has an indirect effect on loneliness, via increased social capital.

Bonding social capital is characterised by close, emotionally supportive, reciprocal relationships (Wellman & Wortley, 1990). The questionnaire used in the current study specifically focussed on close bonds within university, suggesting that students able to form close relationships within their first year at university are less likely to experience loneliness. In contrast, bridging social capital refers to acquaintances, typically characterised by weaker ties and a broader social network. These social relationships often provide access to different perspectives and opportunities, and are typically not associated with emotional support (Granovetter, 1973). In the context of our survey, bridging capital identifies the extent to which the student identifies with the broader student community, through involvement in university activities and a willingness to try new things and meet new people. Again, unsurprisingly, this was associated with lower levels of loneliness in students, in line with previous research in to the benefits of a positive transition to university (e.g. Maunder et al., 2013).

Importantly for students experiencing transition, we also identified that maintained social capital was associated with reductions in loneliness. Paul and Brier (2001) refer to the term 'friendsickness' where students experience negative feelings associated with the disruption to old friendships in the transition to higher education. Ellison et al. (2007) reported that students in higher education's primary use of social media is to maintain links with old friends, and thus enhance maintained social capital. Here, we demonstrate
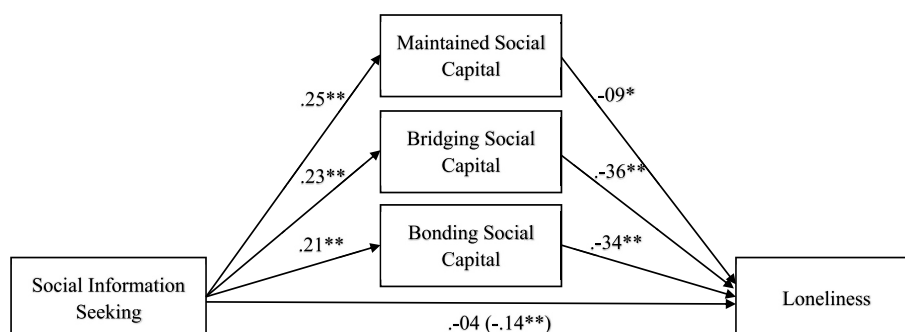
Fig. 2. Multiple mediation model: analysing the indirect relationship between social information seeking and loneliness, through social capital.

that the maintenance of social capital can significantly protect against loneliness experienced in students.

Burke, Kraut, and Marlow (2011) discussed that social media use has often been treated as a single construct, focussing purely on the frequency or intensity of use. They argue that investigating the different ways in which individuals use social media better explains the possible psychosocial outcomes. For example, using the internet to interact with strangers and meet new people has actually been associated with more negative outcomes (Bessière, Kiesler, Kraut, & Boneva, 2008), whereas interacting with existing friends online has been linked to more positive outcomes, such as relationship quality (Valkenburg & Peter, 2007). Thomas et al. (2017) found that balancing the maintenance of existing relationships with the development of new relationships was both aided and challenged by social media use as boundaries between these communities became blurred.

As such, we assessed both social media intensity and social media connection strategies in order to identify their relative importance in reducing loneliness. Social media intensity, using social media to maintain friendships and using social media for social information seeking, were all significantly negatively correlated with loneliness. However, Ellison et al. (2011) identified that social information seeking in particular has been strongly associated with social capital. Social information seeking was the only significant predictor amongst these measures in the final regression model, but in contrast to the bivariate correlations it was a positive predictor. Upon further analysis, we identified that there is an indirect relationship between social information seeking and loneliness, via social capital. Whilst all forms of social capital significantly mediated the relationship, this was particularly evident for bridging and bonding capital. We suggest that this supports the findings of Ellison et al. (2011), reflecting students using social media to learn information about offline contacts in order to enhance or maintain both close and weak ties. We then extend these findings to demonstrate that this in turn has the effect of reducing loneliness.

These findings add to work by Thomas et al. (2017), who found that students transitioning to university distinguished between relationships developed primarily offline rather than online and the possibility for misunderstanding that came from relying on social media presentations of new acquaintances. What is evident from our findings is that while many universities encourage students to use online platforms to communicate and develop relationships, their real value may lie in the maintenance of existing friendships and the use of social media to facilitate offline relationships. As virtual and distance learning are increasingly developed by higher education institutions, consideration of how learning communities are formed, and the importance of offline as well as online interaction to support the formation of these communities and mitigate possible loneliness is established by our study.

This distinction between the use of social media to maintain existing relationships and the role of social media in developing new relationships links to the idea of the liminoid digital self, as established by Kerrigan and Hart (2016). Following Turner's (1967) conceptualization of transition states, they argue that the social media age means that life transitions are not a case of moving from one state of being to another, but rather, that people are now inhabiting a 'betwixt and between' state where they negotiate a number of identities and links to different communities. Therefore, in understanding and countering student loneliness, the need to distinguish between the maintenance of existing relationships and ways of developing new ones can lead to a focus on the 'in real life' interactions for transitioning students, rather than developing a focus on the use of online platforms to create communities.

5. Conclusion

In this study, we demonstrated a significant negative relationship between the liminal self measure, and student loneliness. This indicates that students who do not censor their previous online identity when transitioning to university are less likely to experience loneliness throughout the transition. Self-censorship online is already well documented (see Das & Kramer, 2013). However, work that has explored the nuanced ways young people manage and edit their social media personas gives cause for concern. The 'Chilling Effect' describes the phenomenon of people constraining how they present themselves online due to peer surveillance on social media (Marder, Joinson, Shankar, & Houghton, 2016). Further, the '*extended* Chilling Effect' applies offline, with the threat of surveillance constraining self presentation in the real world also. Students transitioning to university are vulnerable to the demands of social media, and as work has now shown, the decision to present an edited self at university may lead to poorer mental health.

5.1. What can universities do?

The first step in improving the transition experiences of university students is making the assumptions around transitions explicit (Gale & Parker, 2014). Rather than viewing transition as a process by which students must exclusively adjust to their new environment, universities could take steps to create an inclusive environment and recognise diversity in order to build a sense of community for all students. This sense of community and belonging underpins many of the significant predictors of loneliness reported here.

Recent work by Moeller and Seehuus (2019) indicated that verbal social skills (social control, social expressivity and social sensitivity) play an important role in students' experience of loneliness, as well as depression and anxiety. The authors recommend institutions should consider improving the social skills of their students if seeking to reduce the mental health burdens they experience. This assumption, that universities support the development of social skills, coupled with Potter's (2017) urging for greater engagement with digital literacy, inform our work. Our findings suggest that students are using social media to learn information about offline contacts, in order to enhance or maintain both close and weak ties. In light of this, we propose that social information seeking may facilitate social expressivity, which Moeller and Seehuus define as '*the verbal ability to initiate conversation, engage others in social interactions with verbal interactions*' (p.4). Using social media to find out more about others might help students initiate conversations and engage in face-to-face interaction, as a precursor to verbal social skills, and in turn reduced loneliness.

As such, universities should consider face to face social interactions, facilitated by digital interactions, rather than privileging one over another, or assuming that young people 'live digitally' rather than existing in a hybrid state. We believe a full assessment of

university induction practises to understand how these digital relationships are introduced and supported is necessary. Early work by Forrester et al. (Forrester, Motteram, Parkinson, & Slaouti, 2005; Motteram & Forrester, 2005) set out some valuable guidelines for effective induction of students into higher education. However, this was prior to the advent of Facebook and widespread use of social media. We believe a full assessment of university induction practises to understand how these digital relationships are introduced and supported is necessary, and our work is a first step in recognising the complex factors that influence student well-being today.

5.2. Future work

Whilst we have explored the transition into university life, we recognise that this liminal time in a student's life will come to an end, and would propose that a further exploration of the transition *out* of university is of value. Burnett (2007) suggests that the final-year student experience is worthy of greater research, particularly in relation to the mapping of institution-specific graduate attributes and employment outcomes. More recently, the Graduate Mental Wellbeing in the Workplace report (Reino & Byrom, 2017) considers how universities can best prepare students for the transition into the workplace, stress, and mental well-being. A key finding from this report was that universities could do more to prepare students when they leave.

In addition, as virtual and distance learning (DL) courses are increasingly developed by higher education institutions, consideration of how these kinds of communities are formed to mitigate loneliness should be a research priority. There has been an increased focus on how distance learning students integrate into university life (Moller, 1998; Wegerif, 1998). Several studies have reported that successful integration or alienation from the institution are key factors in continuation in DL provision (Morgan & Tam, 1999; Rovai & Wighting, 2005). Motteram and Forrester (2005) identify that for DL students, the relationships they form with their peers are key to unlocking the potential of online learning.

Acknowledgment

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.compedu.2019.103754.

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