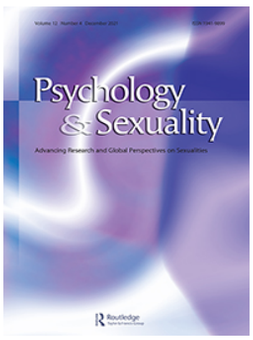

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Asexuality and relationship investment: visible differences in relationship investment for an invisible minority

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ABSTRACT

Sexual attraction is a component of most romantic relationships, making it difficult to disentangle from other motives to invest in relationships. Despite the lack of sexual attraction that characterises asexuality, many self-identified asexual individuals report the desire to enter a romantic relationship. These understudied individuals provide a unique opportunity to study relationship investment in the absence of sexual attraction. We compared relationship investment, a well-established aspect of interpersonal relationships, between asexual (n = 139) and allosexual (n = 224) individuals. Participants completed a modified Investment Model Scale, which examined satisfaction, quality of alternatives, investment size, and commitment in romantic relationships and friendships. Contrary to our prediction that asexual individuals would invest less than allosexual individuals in romantic relationships, but not in friendships, they reported lower satisfaction, investment size, and commitment, and higher quality of alternatives than did allosexual individuals across both types of relationships. Although lack of sexual attraction could explain lower investment scores in romantic relationships for asexual individuals, some other effect may be responsible for reported differential investment in friendships.

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Sexual orientation; asexuality; romantic relationships; friendships; relationship investment

Asexuality is defined as a lack of sexual attraction to or a lack of sexual interest in others that is typically long-lasting, even lifelong (Bogaert, 2004; Brotto & Yule, 2017). This characteristic makes it likely that asexual individuals experience different motives and levels of commitment to romantic relationships compared to individuals that experience sexual attraction (hereafter referred to as allosexual individuals[1]). Little research has been conducted with this group, partially due to their scarcity, with some estimates placing the occurrence of asexuality within the general population as low as 0.5% (Poston & Baumle, 2010). By investigating how lack of sexual attraction predicts relationship investment, we can better understand the role that attraction plays in relationships broadly and how members of an understudied minority may experience relationships specifically (Bogaert, 2012, 2015). Asexual individuals can be subjected to intense prejudice and discrimination from not only heterosexual individuals, but also from within the LGBT+ community (Mosbergen, 2013). An improved understanding of how a lack of sexual attraction impacts the lives of members of this minority group is especially important given that it was once harmfully considered as a mental disorder rather than a sexual orientation (Houdenhove et al., 2017).

For self-identified asexual individuals, it is likely that interpersonal relationships, especially romantic ones, are experienced differently compared to how they are experienced by allosexuals. There are many components to romantic relationships, but sexual attraction is (usually) especially

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important when first developing a romantic relationship (e.g. Janz et al., 2015). Unfortunately, to date, there has been very little research investigating how romantic relationships with an asexual partner differ from those with a partner who is sexually interested, although it is important to note that many asexual individuals have experienced sexual intercourse, especially before realising their asexual orientation (Mitchell & Hunnicutt, 2019). By examining romantic relationships from the perspective of individuals who lack sexual attraction, we can expand our understanding of the role that attraction might play in initiating and maintaining relationships generally. We can also gain a better understanding of how individuals that experience long-term lack of attraction invest in both romantic and non-romantic relationships (i.e. friendships).

Considering that asexuality is characterised by a lack of sexual attraction to others, it is likely that the relationship investment of self-identified asexual individuals will differ from that of allosexual individuals, particularly regarding investment in romantic relationships. Differences in investment in other relationships, such as family relationships and friendships, are likely to also be impacted due to their status as a sexual minority (Rostosky & Riggle, 2017). For some individuals, lower investment in romantic relationships may indicate a greater reliance on other relationships to fulfill their needs; conversely, lower investment in romantic relationships may indicate a reluctance to form close relationships. Given the paucity of existing research, we aim to identify how asexual individuals (i.e. those reporting low sexual attraction) invest across romantic relationships and friendships.

Investment model

Rusbult's Investment Model (Rusbult, 1980) proposes three global facets that contribute to an individual's commitment to a relationship: satisfaction level, quality of alternatives, and investment size. Satisfaction level measures the ratio of positive to negative affect resulting from the relationship (Rusbult et al., 1998). Satisfaction is influenced by many factors, such as how well a person's needs are met within that relationship. It has long been thought to play a crucial role in relationship commitment, but is insufficient to explain commitment on its own (Rusbult, 1980).

A second important component of commitment to a relationship is the quality of available alternatives. Rusbult et al. (1998, p. 359) define quality of alternatives as 'the perceived desirability of the best available alternative to a relationship.' If the available alternatives are of poor quality, then an individual is likely to be more committed to a relationship, even if they are dissatisfied with that relationship. The quality of alternative relationships is determined by how well our needs can be fulfilled by those alternatives. If alternative relationships are better able to satisfy one's needs than a current relationship, then one may prefer to spend more time in those alternative relationships. These alternatives are typically represented by relationships with others, whether they are friendships or relationships with family members, but can also represent spending time alone (i.e. if being alone is preferable to being with one's partner).

The final component of Rusbult's Investment Model (Rusbult, 1980) is investment size, which refers to resources that have become attached to the relationship and may be lost if that relationship were to end. Typically, the greater the investment, the greater the commitment to that relationship. If we have invested a lot of resources and/or time in a relationship, then we may continue to commit to that relationship even if that relationship is no longer satisfying and there are better alternatives available. Couples with longer relationships have higher investment scores (Rusbult et al., 1998).

All three components of satisfaction, quality of alternatives, and investment size contribute to commitment level (i.e. the intent to continue a relationship; Rusbult et al., 1998). If commitment is low, it is unlikely that an individual will persist in that relationship. Indeed, commitment to a relationship has been considered to be the best predictor of persistence in a relationship (Bui et al., 1996), although the three components of commitment contribute individually to the likelihood of an individual staying in a relationship (Rhatigan & Axsom, 2006).

Although designed for application to romantic relationships for heterosexual couples, the Investment Model has been applied to other types of relationships and groups. The model is a good fit for predicting friendship stability (e.g. Branje et al., 2007; Chow & Tan, 2013). However, friendships differ from romantic relationships, which is reflected primarily within the quality of alternatives facet. With some exceptions (e.g. polyamory, friends with benefits, swingers), most romantic relationships are exclusive (i.e. limited to two individuals), whereas friendships are generally not exclusive. Quality of alternatives may be less relevant for determining commitment to friendships compared to romantic relationships, reflecting a difference in exclusivity (Le & Agnew, 2003). To address differences in exclusivity, Branje et al. (2007) found the Investment Model had good predictive power in determining commitment to a best friend over time.

Although the Investment Model was constructed using primarily heterosexual samples, it has also been successfully applied to gay and lesbian romantic relationships (Duffy & Rusbult, 1985). Duffy and Rusbult (1985) found that heterosexual participants reported slightly higher costs and investments in romantic relationships compared to gay and lesbian participants, but noted that these differences were minor, with gender being a more powerful predictor of relationship investment. However, the Investment Model could not fully explain commitment and stability within gay and lesbian romantic relationships. Beals et al. (2002) found that commitment in lesbian relationships accounted for only 5% of the variance in stability, whereas commitment in heterosexual relationships accounted for 20% of the variance in stability (Bui et al., 1996). It is worth exploring the application of the Investment Model to other less well studied populations and relationships.

As the Investment Model has yet to be applied to asexual interpersonal relationships, we examined if a lack of sexual attraction can predict relationship investment in romantic relationships and friendships. It is likely that the lack of sexual attraction to others that asexual individuals experience would predict commitment to romantic relationships. Specifically, asexual participants may report lower satisfaction, investment size, and commitment, and higher quality of alternatives than allosexual participants, but these differences may be specific to romantic relationships because of the role that sexual attraction can play in initiating and maintaining romantic relationships. Alternatively, asexual individuals may experience lower satisfaction, investment size, and commitment, and higher quality of alternatives in both romantic relationships and friendships, due to other aspects of their status as a sexual minority unrelated to the lack of sexual attraction. Determining which pattern best characterises the interpersonal relationships of asexual individuals will improve our understanding of this sexual minority, and the role of sexual attraction in relationships more broadly.

Method

Participants

Three hundred and sixty-three participants (79 male, 260 female, and 24 'Other;' 278 White, 23 Black, 12 Hispanic, 27 Asian, and 23 'Other'), aged 18 years or older (M = 22.26, SD = 5.82) were recruited. Twenty-five additional participants (10 asexual, 15 allosexual) were excluded from analysis due to outliers or incorrect responses on the attention check questions. Participants were recruited from an online psychology participant pool at a midwestern American university (n = 224) and through several online asexual communities (AVEN, Fetlife, Reddit, n = 139). The distributions of gender, ethnicity, and age across sexual orientations are displayed in (Table 1). Gender and ethnicity were reasonably well-matched across samples but the asexual participants were older, on average, than the allosexual participants.

Participants recruited through an online psychology participant pool received course credit and the participants recruited through online asexual communities could provide a contact email to be entered into a raffle for a $50 Amazon gift card.

Table 1. Gender, ethnicity, and age by sexuality of total sample.

Sexuality	Asexual		Allosexual		Total	
Gender	*N*	%	*N*	%	*N*	%
Male	35	10	44	12	79	22
Female	84	23	176	48	260	71
Other	20	6	4	1	24	07
Ethnicity	*N*	%	*N*	%	*N*	%
White	109	30	169	47	278	77
Black	3	1	20	5	23	06
Hispanic	7	2	5	1	12	03
Asian	9	2	18	5	27	07
Other	11	3	12	3	23	06
Total	139	38	224	62	363	100
	N	*SD*	*N*	*SD*	*N*	*SD*
Age	25.12	7.29	20.48	3.70	22.26	5.82

Materials and procedures

Participants completed the measures through Qualtrics.com, a secure online survey distribution platform. First, they provided demographic information, including age, gender, ethnicity, marital status, length of current/most recent relationship, number of previous romantic relationships, number of previous sexual partners, sexual orientation, highest education level obtained, and religious affiliation. Participants were given the following options when describing their gender identity: 'male,' 'female,' 'trans male,' (n = 1) 'trans female,' 'nonbinary,' (n = 14) 'other,' (n = 7) in which they could write in their preferred gender, and 'prefer not to say' (n = 2). When indicating their sexual orientation, participants were also asked to indicate their attraction to men and women according to a seven-point Likert scale, ranging from 0 (Not at all attracted) to 6 (Very attracted). Participants who selected asexual were also asked to specify if they identified as asexual, aromantic, grey-asexual (sub-groups of asexuality that are commonly used within asexual communities; Macneela & Murphy, 2015), or some other specification. In addition, they completed the following measures[2]:

Asexuality identification scale (AIS)

The Asexuality Identification Scale (AIS) is a 12-item questionnaire (α = .96) designed to distinguish between allosexual and asexual individuals based on a lack of sexual attraction. Each of the items (e.g. 'I lack interest in sexual activity') is scored on a five-point Likert scale and summed to provide an AIS score between 12 and 60. Scores higher than 40 indicate asexual tendencies and a general lack of sexual attraction (Yule et al., 2015).

Investment model scale

Two versions of the Investment Model Scale (IMS) were presented to participants. All participants responded to all versions in the same order unless they indicated that they had not experienced the relevant relationship. The first version was the romantic relationships IMS as outlined by Rusbult et al. (1998). This version is a 25-item scale measuring the global facets of satisfaction level (α = .98; 'I feel satisfied with our relationship'), quality of alternatives (α = .85; 'The people other than my partner with whom I might become involved are very appealing'), investment size (α = .85; 'I feel very involved in our relationship – like I have put a great deal into it'), and commitment level (α = .91; 'I want our relationship to last for a very long time'). Each item is scored on a nine-point Likert scale, ranging from 0 (Do not agree at all) to 8 (Agree completely), with some items in the quality of alternatives scale being reverse scored. Participants were instructed to answer the questions for a current relationship or, if not currently in a relationship, with their most recent relationship in mind. Participants that indicated that they had not yet been in a romantic relationship were not presented with these items.

The second version of the IMS was designed to measure investment (satisfaction $\alpha = .80$; quality of alternatives $\alpha = .71$; investment size $\alpha = .74$; commitment $\alpha = .86$) in a close friendship. In this version, any references to romantic relationships and dating partner were changed to friendships and friend, respectively (e.g. 'The people other than my friend with whom I might become involved are very appealing'). Additionally, in this version of the IMS, the items that asked about sexual factors (one in each of the satisfaction and quality of alternatives facets) were removed. Other studies have used similar alterations (e.g. Branje et al., 2007; Ponti et al., 2010). Participants were asked how long they had known this friend, as well as that friend's gender and sexual orientation. Participants that indicated that they did not have a close friend were not presented with these items.

Results

Descriptive statistics and zero order correlations between the AIS and relationship investment facets are displayed in (Table 2). An independent samples t-test indicated that, as expected, self-identified asexual participants ($M = 50.93$, $SD = 6.85$) reported significantly lower sexual attraction than did the allosexual participants ($M = 23.25$, $SD = 9.38$; $t = -32.26$, $p < .001$).

Investment in romantic relationships vs. friendships

To determine if the distribution of relationship investment across relationship types varies according to sexual orientation (asexual, allosexual) and gender (male, female[3]), full factorial mixed-model ANOVAs were performed for each of the IMS constructs: satisfaction, quality of alternatives, investment size, and commitment. In cases where sphericity assumptions were violated, Greenhouse-Geisser corrections were applied. The following ANOVAs include data only from participants that completed both versions of the IMS ($N = 174$ allosexual and 49 asexual participants). Distribution of gender by sexual orientation of participants included in these analyses is displayed in (Table 3).

Satisfaction within romantic relationships ($M = 5.45$, $SE = 0.23$) was significantly lower than in friendships ($M = 6.83$, $SE = 0.14$, $F(1, 219) = 29.60$, $p < .001$, $\eta_p^2 = .12$). Satisfaction for asexual participants ($M = 5.46$, $SE = 0.25$) was significantly lower than for allosexual participants ($M = 6.83$, $SE = 0.14$, $F(1, 219) = 22.22$, $p < .001$, $\eta_p^2 = .09$). There was no significant main effect for gender and no significant interactions, all $p's > .18$.

Quality of alternatives for asexual participants ($M = 5.57$, $SE = 0.26$) was significantly higher than for allosexual participants ($M = 4.67$, $SE = 0.15$, $F(1, 219) = 9.17$, $p = .003$, $\eta_p^2 = .04$).[4] There were no significant main effects for relationship type or for gender and no significant interactions, all $p's > .19$.

Table 2. Descriptive statistics and zero order correlations.

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Sexual Orientation	-										
2. Gender	−.24**	-									
3. Asexuality Identification Scale	−.79**	−.18**	-								
4. Romantic Satisfaction	−.28**	−.06**	−.36**	-							
5. Romantic Quality of Alternatives	−.06**	−.06**	−.01**	−.49**	-						
6. Romantic Investment Size	−.29**	−.04**	−.35**	−.73**	−.50**	-					
7. Romantic Commitment	−.22**	−.04**	−.27**	−.81**	−.50**	−.75**	-				
8. Friendship Satisfaction	−.36**	−.05**	−.32**	−.23**	−.11**	−.11**	−.11**	-			
9. Friendship Quality of Alternatives	−.23**	−.13**	−.25**	−.15**	−.22**	−.04**	−.13**	−.08**	-		
10. Friendship Investment Size	−.31**	−.11**	−.32**	−.15**	−.14**	−.15**	−.06**	−.59**	−.04**	-	
11. Friendship Commitment	−.16**	−.02**	−.16**	−.10**	−.20**	−.12**	−.14**	−.51**	−.13**	−.53**	-
M			33.86	5.99	5.36	5.69	5.60	6.97	4.83	5.93	6.51
SD			15.93	2.48	2.33	2.31	1.74	1.47	1.62	1.76	0.89

* = $p < .05$. ** = $p < .01$.

Table 3. Breakdown of gender by sexuality by subsets included in different analyses.

Investment in Romantic Relationships vs Friendships Mixed-Model ANOVA						
	Asexual		Allosexual		Total	
Gender	*N*	%	*N*	%	*N*	%
Male	011	022	034	020	045	020
Female	038	078	140	080	178	080
Total	049	100	174	100	223	100
Investment in Friendships ANOVA						
	Asexual		Allosexual		Total	
Gender	*N*	%	*N*	%	*N*	%
Male	031	029	042	020	073	023
Female	077	071	170	080	247	077
Total	108	100	212	100	320	100
Allosexual Romantic Relationship & Friendship Regression						
	Romantic Relationship		Friendship			
Gender	*N*	%	*N*	%		
Male	038	021	043	020		
Female	145	079	170	080		
Total	183	100	213	100		

% shows percentage of males/females within each sexual orientation to allow comparison of representation within samples.

Investment size within romantic relationships ($M = 5.14$, $SE = 0.22$) was significantly lower than in friendships ($M = 5.85$, $SE = 0.16$, $F(1, 219) = 7.32$, $p = .007$, $\eta_p^2 = .03$). Investment size for asexual participants ($M = 4.72$, $SE = 0.24$) was significantly lower than for allosexual participants ($M = 6.28$, $SE = 0.14$, $F(1, 219) = 31.80$, $p < .001$, $\eta_p^2 = .13$). There was no significant main effect for gender and no significant interactions, all p's $> .36$.

Commitment within romantic relationships ($M = 5.34$, $SE = 0.17$) was significantly lower than in friendships ($M = 6.58$, $SE = 0.08$, $F(1, 219) = 39.02$, $p < .001$, $\eta_p^2 = .15$). This effect persisted even after controlling for length of romantic relationship, $F(1, 217) = 74.66$, $p < .001$, $\eta_p^2 = .26$. Commitment for asexual participants ($M = 5.64$, $SE = 0.17$) was significantly lower than for allosexual participants ($M = 6.28$, $SE = 0.14$, $F(1, 219) = 7.71$, $p = .006$, $\eta_p^2 = .03$). There was no significant main effect for gender and no significant interactions, all p's $> .09$.

Because the analyses reported above were limited to those participants that completed both the romantic and friendship IMS scales, only 49 asexual participants were included. To include data from more of the understudied sample of asexual individuals, additional analyses were conducted that compared asexual and allosexual participants on only the friendship IMS scales, because most participants completed this scale. To determine if the distribution of relationship investment within friendships varied according to sexual orientation and gender using the expanded asexual sample, a series of 2 (gender) x 2 (sexual orientation) full factorial ANOVAs were performed for each of the friendship IMS subscales ($N = 212$ allosexual participants and 108 asexual participants). Distribution of gender by sexual orientation of participants included in these analyses is displayed in (Table 3).

Analyses revealed significant main effects of sexual orientation on reported satisfaction ($F(1, 316) = 27.76$, $p < .001$, $\eta_p^2 = .08$), quality of alternatives ($F(1, 316) = 8.85$, $p = .003$, $\eta_p^2 = .03$),[5] investment size ($F(1, 316) = 30.47$, $p < .001$, $\eta_p^2 = .09$), and commitment ($F(1, 316) = 4.51$, $p = .034$, $\eta_p^2 = .01$). Specifically, asexual participants reported lower ($M = 6.29$, $SE = 0.15$) satisfaction than allosexual participants ($M = 7.29$, $SE = 0.12$), higher ($M = 5.14$, $SE = 0.17$) quality of alternatives than allosexual participants ($M = 4.51$, $SE = 0.14$), lower ($M = 5.14$, $SE = 0.18$) investment size than allosexual participants ($M = 6.40$, $SE = 0.14$), and lower ($M = 6.32$, $SE = 0.09$) commitment than allosexual participants ($M = 6.58$, $SE = 0.08$). No significant main effects of gender or interactions were found, all p's $> .12$.

Table 4. Regression coefficients for lack of sexual attraction predicting allosexual relationship investment.

Relationship Investment Facet	F	R^2	B	SE B	β	t	p
Romantic Satisfaction	16.05	.08	−.08	.02	−.29	−4.00	<.001
Romantic Quality of Alternatives	01.47	.01	−.03	.02	−.09	−1.21	<.227
Romantic Investment Size	06.42	.03	−.05	.02	−.19	−2.53	<.012
Romantic Commitment	06.37	.03	−04	.01	−.18	−2.52	<.012
Friendship Satisfaction	02.93	.01	−.02	.01	−.12	−1.71	<.088
Friendship Quality of Alternatives	00.85	.01	−.01	.01	−.06	−0.92	<.357
Friendship Investment Size	04.00	.02	−.03	.01	−.14	−2.00	<.047
Friendship Commitment	00.17	.01	−.01	.01	−.03	−0.41	<.682

To mitigate concerns about bias in the sub-sample of asexual individuals whose data were included in the primary analyses, we compared individuals that did and did not report data for romantic relationships on key demographics, such as age, gender, their AIS, and friendship investment scores using independent sample t-tests. There were no significant differences in age, AIS, and friendship investment scores (p's > .16). A Chi-square test of independence found that gender was not significantly associated with experience in romantic relationships for asexual participants, X^2 (5, N = 139) = 7.70, p = .174. As might be expected, however, the samples did differ to the extent that they included individuals that identified as aromantic. Participants that identified as aromantic were less likely (19%) to have experienced a romantic relationship than asexual participants that did not also identify as aromantic (59%).

Although a lack of sexual attraction is the defining characteristic of asexuality, the measure we used to quantify it (Asexuality Identification Scale) is a continuous measure that can allow for a range of scores, even among the allosexual participants, some of whom scored above the cut-off for what the measure considered to be 'asexual' (N = 14). In an attempt to clarify the role of lack of sexual attraction in predicting investment, we examined the association between lack of sexual attraction as scored by the AIS and relationship investment scores for only allosexual participants. In this way, we could disentangle the role of sexual attraction from identification as a sexual minority. To determine if lack of sexual attraction predicted allosexual participants' relationship investment scores, we regressed satisfaction, quality of alternatives, investment size, and commitment in romantic relationships (N = 183) and friendships (N = 213) on the AIS scores for allosexual participants. Distribution of gender by relationship type included in these analyses is displayed in (Table 3). Significant regression equations were found for satisfaction in romantic relationships (F(1, 181) = 16.05, p < .001; R^2 = .08), investment size in romantic relationships (F(1, 181) = 6.42, p = .012; R^2 = .03), commitment in romantic relationships (F(1, 181) = 6.37, p = .012; R^2 = .03), and for investment size in friendships (F(1, 211) = 4.00, p = .047; R^2 = .02). No other significant regression equations were found, all p's > .08. Results are displayed in (Table 4).

Discussion

The defining feature of asexuality is a lack of sexual attraction and sexual desire directed towards others. Considering the role that sexual attraction usually plays in the early stages of romantic relationships (Poulsen et al., 2012), we hypothesised that asexual individuals – identified as those with low levels of sexual attraction – would invest less in these relationships. As predicted, asexual participants reported lower scores on satisfaction, investment size, and commitment, and higher scores on the quality of alternatives, as measured by the IMS, compared to allosexual participants. These differences were observed across both romantic relationships and friendships. Although lack of sexual attraction may account for the differences between asexual and allosexual individuals in romantic relationships – a hypothesis supported by the finding that sexual attraction predicted several facets of investment for allosexual individuals alone – the differences in friendships are unlikely to be significantly influenced by this factor. If asexual individuals prioritised friendships due

to investing less in romantic relationships, the differences in friendship investment would have been in the opposite direction to what we found. Differences in relationship investment scores in friendships may instead be due to other aspects of identifying as a sexual minority.

When removing the factor of identification with a sexual minority and analysing data from allosexual participants alone, lack of sexual attraction did predict several of the relationship investment scores among allosexual participants. Specifically, satisfaction, investment size, and commitment in romantic relationships, and investment size in friendships were negatively associated with sexual attraction. Only quality of alternatives in romantic relationships was not predicted by sexual attraction. However, satisfaction, quality of alternatives, and commitment in friendships were not associated with lack of sexual attraction, supporting our suspicion that some other factor, such as age in the case of quality of alternatives, is likely responsible for the observed differences between asexual and allosexual individuals' investment in friendships.

Differences in investment in romantic relationships can indicate the quality of a relationship as well as how long that individual will persist in that relationship (Etcheverry & Agnew, 2004; Impett et al., 2001). Our results indicate that the needs of asexual individuals may not be as fulfilled as those of allosexual individuals. Given that the primary difference between asexual and allosexual individuals is the lack of sexual attraction, this difference was expected. Without the drive to engage in sexual relations, asexual individuals may not feel the need to invest in romantic relationships to the same extent as individuals that do experience sexual attraction. Interestingly, although there were no interactions between sexuality and relationship type, satisfaction, investment size, and commitment were lower in romantic relationships than in friendships. This finding may indicate that the importance of romantic relationships compared to friendships is similar for asexual and allosexual individuals (at least those of college age). This is likely less true for those that specifically identify as aromantic. Lin and Rusbult (1995) conducted a similar comparison of romantic relationships and friendships among college-age participants; however, they found that satisfaction and investment size were higher among dating partners than among friends, rather than lower. These inconsistent findings could suggest an unstable relationship between relationship investment and relationship type. However, sexual activity among young adults decreased from 2000 to 2018 (Ueda et al., 2020), suggesting that a change in college culture since Lin and Rusbult's study was published in 1995 may be a better explanation for these differences.

Rather than a lack of sexual attraction, differences in friendship investment between asexual and allosexual individuals could be attributed to asexual individuals' status as a sexual minority. In addition to directly impacting interpersonal relationships, a lack of sexual attraction may also contribute more broadly to asexual individuals' identification as a sexual minority, which may, in itself, negatively impact the quality of their interpersonal relationships. Self-disclosure plays an important role in many relationships, impacting many aspects, such as satisfaction, maintenance, and development (Imai et al., 2021; Ruppel, 2015). Sexual minorities, including asexual individuals, often feel the need to be very selective of who they share intimate information with due to a fear of rejection and persecution (Mollet, 2021; Wells & Kline, 1987). This pressure for sexual minorities to hide their identity likely negatively impacts their interpersonal relationships, including romantic relationships, should the individual not feel comfortable disclosing their true sexuality to their partner (Harrison, 2003; Mohr et al., 2017).

Like other sexual minorities, asexual individuals can face intense prejudice due to their sexuality (MacInnis & Hodson, 2012). For many, it may be easier to hide their sexuality rather than risk facing these prejudices, potential discrimination, and rejection (Foster et al., 2019). Hiding a lack of sexual attraction may be easier than hiding attraction to a member of the same sex, resulting in asexuality being dubbed the 'invisible' minority (Rothblum et al., 2018, 2020). This may make it even more likely that asexual individuals experience heightened fear of disclosure, which may negatively impact interpersonal relationships. It is worth noting that people who identify as asexual are more introverted than the general population (Bogaert et al., 2018), which may be another contributing factor to differences in relationship investment.

Feeling the need to hide an important part of themselves from others could place a unique strain on interpersonal relationships, otherwise known as 'minority stress' (Meyer, 2003). The inability to disclose their experiences with others may lead to some of these individuals' needs going unfulfilled, reducing satisfaction, investment size, and commitment and raising the quality of alternatives with whom the asexual individual is comfortable confiding in. Self-disclosure has been found to be positively associated with self-esteem, relationship esteem (i.e. confidence as a romantic partner), and satisfaction and commitment to a relationship (not measured using the IMS; Sprecher & Hendrick, 2004). The reduced ability of the Investment Model to explain commitment and stability in gay and lesbian relationships (Beals et al., 2002; Bui et al., 1996) has been linked to stress variables as a result of being a sexual minority, with models that incorporate minority stress variables explaining a greater proportion of the variance in stability (Barrantes et al., 2017). Although not studied here, examining self-disclosure among asexual individuals in romantic relationships and friendships could provide additional insight into how asexuality affects interpersonal relationships.

Additionally, commitment in interpersonal relationships may be lower due to the risk of potentially having to cut ties with friends that may express values or opinions that are discriminatory against sexual minorities. Kamen et al. (2011) found similar effects among gay males, with minority stress effects impacting satisfaction and commitment in romantic relationships. Although the likelihood of these situations occurring is difficult to ascertain, it is probable that it uniquely affects many minority interpersonal relationships. The potential strain of these stressors may prevent asexual individuals from seeking close relationships. Although speculative, such stresses could help to explain in part why asexuality has received less attention from researchers and the general public for so long; by unintentionally choosing to remain 'invisible', asexual individuals may be able to avoid some of the worst hardships that other sexual minorities have had to endure. A determination of whether such motivations predict reduced relationship investment in this population awaits further study.

Limitations

Performing research with LGBT+ individuals, especially members of the asexual community, imposes a variety of unique limitations. Recruiting asexual individuals requires connections to specific communities. Despite the rich resource of communities such as AVEN that have made it their mission to provide asexual individuals with a place to gather and share their experiences and to connect them with researchers, potential biases inherent in such samples exist. For example, members of the asexual community that frequent AVEN and consent to participate in research may differ in important ways from asexual individuals that are not members of this community (Hinderliter, 2009). Furthermore, by recruiting from two different communities, we introduced a confound into our study. Unlike our comparison sample, AVEN community members were not exclusively university students. This difference is reflected in the asexual participants being significantly older (M = 25.12, SD = 7.29) than the allosexual participants (M = 20.48, SD = 3.70), although both groups predominantly included individuals in their twenties. Additionally, a significant percentage of both the university students and asexual samples were female, which is consistent with previous research (Bogaert, 2013; Fowler et al., 2018; Rothblum et al., 2020), but may explain the lack of significant effects of gender. However, even among heterosexual samples, only minor gender differences in relationship investment facets have been reported, with women reporting marginally higher investment size and commitment than men (Duffy & Rusbult, 1985).

Although recruiting both asexual and allosexual participants from a community sample may help to avoid these specific confounds, there are still other significant differences that such recruitment would not address. Participants that are gathered from AVEN, or other similar online asexual communities, are likely to be deeply knowledgeable about, or at least aware of what asexuality is and likely consider themselves to be members of the asexual community. This intimate knowledge can easily influence how these individuals feel about and experience romantic relationships. Within our sample,

there was a small subset of the allosexual population that scored above the cut-off to be considered asexual by the AIS (n = 14). It is possible that these individuals may not identify as asexual due to the potential for discrimination or simply because they are unaware of asexuality. By not identifying as asexual, or by not being aware of asexuality, these individuals may have reported different scores on the relationship investment facets from the outwardly asexual sample, despite the similarities in lack of sexual attraction. These individuals that do not identify as asexual, despite reporting low sexual attraction, may have avoided potential effects of minority stressors on their relationships. Unfortunately, this subset of the sample was not large enough to perform such comparisons.

When working with asexual participants, there are specific sub-groups that would be important to identify to inform a complete understanding of interactions within the community. Asexuality is an umbrella term that covers many variations within asexual communities. Some of the most commonly used terms under this umbrella are asexual, aromantic, and grey-asexual. The asexual community defines aromanticism as a lack of romantic attraction (Antonsen et al., 2020; Hammack et al., 2018), a quality that may impose a variety of differences on interpersonal relationships. Aromantic individuals may experience sexual attraction, potentially preventing measures such as the AIS from properly identifying them as members of the asexual community. For relationship constructs such as relationship investment, aromantic individuals may report much lower scores than even asexual individuals. In contrast, grey-asexuality is defined as a lack of sexual attraction that is inconsistent over time. Therefore, grey-asexual individuals may report similar scores on relationship investment as asexual individuals at any given time point, but may report higher average scores than asexual individuals if recorded over time. To date, the primary focus of past research has been on strictly asexual individuals; aromantic and grey-asexual individuals have received comparatively little attention and are rarely even mentioned outside of these communities (Hille et al., 2019; Macneela & Murphy, 2015). Data from these sub-groups are frequently combined with that from the asexual population, potentially masking any differences between them. Unfortunately, without a better understanding of these sub-groups, attempts to perform research with asexual individuals will encounter many obstacles. Despite attempting to identify these sub-groups within the current sample, the frequency of strictly aromantic (n = 1) and grey-asexual (n = 13) individuals was too low to include in analyses.

Finally, as this study was advertised as asking about their most recent romantic relationship, many aromantic individuals may have been disinterested in participating as these individuals are less likely to have been in a romantic relationship than romantic asexual individuals (Antonsen et al., 2020). Although a small sample, participants in our study that identified as aromantic were also less likely to report having been in a relationship compared to asexual participants that did not also identify as aromantic. Many of the asexual participants in our sample (n = 70), as well as some of the allosexual participants (n = 40), reported having never been in a romantic relationship. This limited their inclusion in analyses that compared relationship investment facets by type of investment or specifically examined within romantic relationships. The demographics and relationship investment scores of this subset of the sample were not substantially different from those that contributed complete data. Despite these challenges, we gathered data from 69 asexual individuals that were currently in/had previously been in a romantic relationship; a not inconsequential sample considering the scarcity of asexuality within the general population (Bogaert, 2004). Furthermore, we were able to explicitly compare those who had previously been in a romantic relationship with those who had not with regard to their investment in relationships – an interesting question in its own right. We found that these participants did not differ in their age, gender, lack of sexual attraction, or in their investment scores in friendships, suggesting that the smaller sample was representative of the more inclusive sample. However, fewer of them identified as aromantic, suggesting the possibility that important differences exist between aromantic and asexual individuals with regard to relationship investment.

Future directions

The current research opens up interesting avenues for future work with asexual and aromantic individuals. Relationship investment has been used to predict the longevity of interpersonal relationships (Etcheverry et al., 2013). Examining if this association holds among asexual populations may offer interesting insight into why asexual individuals choose to enter and persist in such close relationships and the role of sexual attraction during maintenance of these relationships. In the event that relationship investment is a poor predictor of relationship length, this may indicate that some other factor contributes to their persistence. Although this study did not include measures of other facets of relationships, such as disclosure and attachment, our findings encourage future research to investigate hypotheses about minority stress in these groups. Examining unique experiences of subgroups subsumed within the wider umbrella of asexuality presents an important step forward. We did not recruit enough participants from the subgroups of asexuality to identify any unique patterns, but future efforts should attempt to properly define and explore the differences between these specific populations. Further exploration of this and other aspects of how asexual individuals interact with others, such as self-disclosure, will substantially improve our understanding of this sexual minority, which has gone invisible for far too long.

Notes

1. It should be noted that we recognise that asexuality is an umbrella term that encompasses individuals that vary in the degree and stability of their sexual and romantic attraction to others. However, in this study, we use the operational definition of reduced sexual attraction as a defining feature when comparing these individuals to those that report higher levels of sexual attraction.
2. Participants also completed the Multidimensional Model of Sociosexuality (MMSO), the Sexual Desire Inventory-2 (SDI-2), and the Mate Preferences Questionnaire; however, the results of these measures will not be discussed here as they were not the focus of this study.
3. Unfortunately, our sample did not include participants with transgender or non-binary gender identities in sufficient numbers to include within analyses.
4. The main effect of sexual orientation on quality of alternatives did not persist after including age as a covariate.
5. The main effect of sexual orientation on quality of alternatives did not persist after including age as a covariate.

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Consent

Informed consent was obtained from all individual participants included in the studies.

Ethics approval

The questionnaire and methodology of this study was approved by the Institutional Review Board of Oakland University (Reference #: 1428241-1).

Data availability statement

The data described in this article are openly available in the Open Science Framework at osf.io/927xj

Open scholarship

This article has earned the Center for Open Science badges for Open Data and Open Materials through Open Practices Disclosure. The data and materials are openly accessible at https://osf.io/927xj and https://osf.io/927xj

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