ORIGINAL ARTICLE



Taking a Test Drive?: Implicit Theories Sexual Compatibility

Scott S. Hall¹ · David Knox²

Accepted: 15 February 2024 / Published online: 21 March 2024 © The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2024

Abstract

Implicit Theories of Relationships address assumptions about the nature of romantic relationships, whether they are destined to succeed or grow over time through effort. Other implicit theories target certain aspects of sexuality. Implicit Theories of Sexual Compatibility (ITSC) is a proposed application of implicit theories that addresses assumptions about sexual compatibility, whether it is fixed or malleable. The current study investigated characteristics and circumstances that might help explain why individuals differ in their ITSC. A study of 1,443 young adults' questionnaire data revealed that the ITSC items represented two distinct dimensions, namely a fixed and malleable theory. Bivariate and multivariate analyses revealed a variety of background characteristics, sexuality variables, and love/relationship beliefs associated with endorsements of the ITSC, especially the fixed perspective. For example, a fixed perspective especially was associated with being female, having had more extensive intercourse experience, a higher score on a casual sex scale, romantic beliefs, and believing couples should cohabit before marriage to learn what they are getting into.

Keywords Implicit theories · Sexual compatibility · Sexual behavior · Romantic beliefs · Theory

Scott S. Hall sshall@bsu.edu

> David Knox knoxd@ecu.edu

¹ Department of Early Childhood, Youth, and Family Studies TC 605, Ball State University, 47306 Muncie, IN, USA

² Department of Sociology Brewster 419A, East Carolina University, Greenville, USA

Introduction

Test driving a car before purchasing it is a common analogy applied to the rationale for having sexual relations with a prospective spouse. Such a perspective reflects assumptions about sexuality that parallel an implicit theories framework—beliefs about something having a fixed versus malleable nature. Based on the foundational work on implicit theories related to intelligence (e.g., Dweck at al., 1993), Knee's (1998) implicit theories of relationships demonstrated that assumptions about the fixed versus malleable nature of relationship processes contribute to an understanding of relationship-related decisions and outcomes. More recently, implicit theories related to sexuality in relationships suggest that they, too, influence decisions and behavior in romantic relationships (Bohns et al., 2015; Maxwell, et al., 2017).

The test drive analogy hints at assumptions about sexual compatibility between partners and implies that sexual compatibility is revealed through one or more sexual encounters rather than being cultivated with time and deliberate effort. Those who believe that sexual compatibility is revealed rather than cultivated are more likely to want to test sexual compatibility with a partner before committing exclusively to the partner. Such an assumption may influence a person to have an array of sexual experiences with a variety of sexual partners to discover one's own preferences which would inform what they are looking for in that final test drive (Busby et al., 2010).

The current study builds on previous research on sexual implicit theories by investigating differences in young adults related to various levels of implicit theory endorsement. Such an investigation may provide insight into how individuals develop their theories and what belief systems and experiences related to sexuality and relationships correspond to such theories. Understanding contributions to theory endorsement can inform efforts that critically analyze and promote theories that are most beneficial to young adults' goals. Such knowledge becomes increasingly valuable as the science of implicit theories continues to advance understanding of their impact on relationship choices and outcomes.

Implicit Theories of Relationships

Inspired by literature on social judgement, particularly beliefs about whether intelligence is a stable characteristic or something that can develop through effort—implicit theories of intelligence (Dweck at al., 1993), Knee (1998) proposed that people have parallel beliefs about romantic relationships. Specifically, Implicit Theories of Relationships (ITR) include sets of beliefs asserting that romantic relationships are destined (e.g., potential relationship partners are either compatible or they are not) and a set of beliefs advocating that relationships grow into success with time and effort (e.g., a successful relationship evolves through hard work and resolution of incompatibilities). These two sets of beliefs, or implicit theories, only modestly correlate and thus operate somewhat independently and can both be endorsed with the same vigor by an individual (Knee, 1998; Knee et al., 2003). For example, one might believe that some partners are destined to be a good fit for one another, but their relationship would still require work to overcome mismatches that threaten the relationship. function at a certain level of emotional intimacy but these same relationships can benefit from effort to improve/enhance the intimacy of the partners.

As with implicit theories of intelligence, ITR have important implications for decisions and behaviors. Whereas believing that intelligence is fixed has been associated with the early abandonment of difficult tasks (Dweck, 1996; Hong et al., 1995), believing relationships are destined has been associated with early abandonment of initially less-than-optimal relationships (Knee, 1998). Furthermore, growth beliefs associated with more active coping, suppression of competing activities, and reinterpreting relationship challenges more positively, while destiny beliefs were associated with disengaging from conflict (see also Knee et al., 2002; Wiegel et al., 2016).

Previous research suggests that implicit theories can be particularly relevant as moderating variables between constructs. For example, ITR moderated the association between positive perceptions of one's partner and relationship satisfaction in that this association was stronger when individuals endorsed growth-oriented but not destiny-oriented implicit theories (Knee et al., 2001). In an application of implicit theories to beliefs about the fixed or malleable nature of what it means to be married (Hall, 2012a), young adults who reported higher marital quality between their parents had a stronger desire to marry, but only when they endorsed the fixed Implicit Theory of the Marital Institution (ITMI; Hall, 2012b). In the same study, believing that marriage has a special status and having a strong desire to marry were only associated when endorsing the fixed. Other research found that implicit theories indirectly associated with relationship satisfaction, accommodation, and commitment in that growth ITR beliefs predicted self-expansion which then predicted these relationship qualities (Mattingly et al., 2019). In short, implicit theories related to relationshiporiented phenomena appear to play meaningful roles in how individuals perceive and navigate romantic relationships.

Sexuality Implicit Theories

Implicit Theories of Relationships (ITR; Knee, 1998) is a relatively broad model for implicit theories (Maxwell et al., 2017). ITRs do not speak to specific domains of the relationship but rather to beliefs about the potential success of a relationship. While relationship elements of "love" and "conflict" are mentioned in the measures of ITR, measure items are scaled so that each of the two sets of beliefs become a broader implicit theory, each with a latent emphasis on relationship success being fixed or malleable. Thus, ITRs are not operationalized to represent beliefs about particular or facets or domains of romantic relationships (e.g., commitment, affection, unity). Research suggests that domain-specific implicit theories are most predictive of outcomes within that same domain (Knee et al., 2003; Muise & Impett, 2015; Rydell et al., 2007). Hence, some recent research has applied implicit theories frameworks to investigate the sexual domain of relationships more specifically.

One such investigation developed the Implicit Theories of Sexual Attraction model (TOSA; Bohns et al., 2015). This model focuses on beliefs about sexual attraction or chemistry between people and whether it can be changed (e.g., you have a certain amount of sexual attraction to someone and you can't really do much to change it). The fixed perspective is encapsulated by the idea that sexual chemistry can't be

manufactured, akin to not being able to make oneself like eating Brussel sprouts. The malleable perspective suggests that being strategic about the sexual relationship can cultivate sexual attraction over time. This model appears similar to ITR but with a narrower focus on sexual spark. Analyses of the data revealed that a destiny orientation of TOSA correlated modestly with the destiny ITR and minimally with the growth ITR, suggesting only some overlap between the two models of implicit theories. TOSA associated with relational continuance beliefs in that having a more growth/malleable perspective on sexual chemistry predicted participants believing that people with little sexual chemistry should give their relationship more time to develop chemistry. This pattern existed when ITRs were controlled, illustrating that the domain-specific nature of TOSA explained variance independent of the broader ITR model.

Implicit Theories of Sexuality (ITS) likewise target an aspect of sexuality in romantic relationships, specifically regarding the maintenance of sexual satisfaction (Maxwell, et al., 2017). The model's stated emphasis is to contrast beliefs about the process of maintaining sexual satisfaction, whether it incorporates intentional effort (e.g., through hard work, exerting time and energy, making compromises) or is destined (e.g., a good match, meant to be, clear from the start). The model is also designed for investigating existing romantic relationships. Maxwell and colleagues (2017) conducted research with adults in committed relationships, finding that growth ITS beliefs were associated with higher sexual and relationship satisfaction. Furthermore, destiny ITS beliefs appeared to moderate (strengthen) the association between daily sexual disagreements and negative sexual experiences. Overall, research on sexuality-related implicit theories has established that such beliefs address a narrower relationship domain than ITR and have plausible, noteworthy implications for how people interpret their sexual experiences and manage their romantic relationships in the face of relational challenges.

The Current Study

The test drive assumption reflects the notion that potential partners vary in their sexual compatibility and that such compatibility may be detectable through initial sexual encounters. In other words, not having sex with someone prior to making a life-altering commitment could potentially trap someone into a sexually unfulfilling relationship due to sexual incompatibility. The growth or malleable counterpart assumption suggests that sexual compatibility is something that is cultivated over time and can be strengthened with deliberate effort. We propose the Implicit Theories of Sexual Compatibility (ITSC) framework to represent two sets of beliefs regarding sexual compatibility. Sexual compatibility might be implied in the TOSA framework, but its emphasis is on attraction, operationalized as "chemistry," and connotes natural, mutual interest and appeal. In contrast, sexuality literature typically refers sexual compatibility as similarity of sexual needs, expectations, and preferences, as well as mutual understanding and mutually positive outcomes (Hulbert et al., 1993; Nekoolaltak et al., 2020; Pumine & Carey, 1997). Thus, potential sexual partners might experience strong attraction and sexual excitement (i.e., chemistry) while also having different ideas and preferences related to sex that do not mesh well.

ITS, with its emphasis on the process of maintaining sexual satisfaction in a committed relationship, references compatibility in four of its 11 items measuring the destiny perspective (e.g., "sexually compatible," "good match," "poor match") and in four of its 13 items for measuring the sexual growth perspective (e.g., "sexual differences," "resolution of incompatibilities"). Other concepts of ITS include maintaining satisfaction through time, work, t and energy; meanings related to ebbs and flows of satisfaction; signs of being meant to be; and the role of love in sexual chemistry. Through scaling of the 11 and 13 items, sexual compatibility beliefs become undetectable from other facets of sexuality. ITSC focuses exclusively on beliefs about sexual compatibility.

Besides the potential precision which may result from the use of the proposed ITSC framework to target sexual compatibility assumptions, the current study investigates correlates of the fixed and malleable beliefs that seemingly address reasons for endorsing these beliefs. Studies using the ITR framework have typically found little association between demographic variables or select relationship variables (i.e., relationship status, relationship length, number of past relationships) and the destiny and growth belief sets (Knee et al., 2003; Knee & Petty, 2013). Similarly, Bohns et al. (2015), accounting for only income, education level, gender, and age, found scant evidence that such background variables related to the TOSA. However, Maxwell et al. (2017), accounting for a few background factors (gender, current relationship length, sexual frequency in one's current relationship, and marital status), found a tendency for men (compared to women) to more strongly endorse destiny beliefs of sexuality and for women (compared to men) to more strongly endorse growth beliefs of sexuality. The researchers also found that individuals in longer relationships and individuals who reported lower sexual frequency tended to be less destiny oriented. A major goal of the current study was to learn more about characteristics and circumstances that might help explain why individuals differ regarding their assumptions about sexual compatibility.

Literature on implicit theories of personal traits (e.g., intelligence) attributes variations to a person's upbringing. For example, family member modeling, interaction with parents (e.g., messages they share, what they praise), and experiences with peers reinforce beliefs about human nature that become internalized (Mueller & Dweck, 1998). Some researchers have also found race to be associated with relationship destiny beliefs (Franuik et al., 2002). Knee and colleagues (2003) argued that as with other knowledge structures—like working models and relational schemas—ITR are influenced by relationship experiences. For example, children exposed to authoritarian parenting were more likely to endorse destiny beliefs as young adults (Chen et al., 2023). Regarding the nature of marriage, ITMI were associated with certain beliefs about marriage, such as the importance of mutuality and romanticism, and with being religious and one's sexual history (Hall, 2012b). Finally, various relationship beliefs have also associated with parental marital status (Miles & Servaty-Seib, 2010), history of sexual abuse (Larson & Lamont, 2005), frequency of past sexual intercourse (Willougby et al., 2015), and willingness to and experience with hooking up (Hall et al., 2017). In summary, the literature suggests that background characteristics, beliefs, and experiences related to sexuality and romantic relationships could differentiate variation in people's implicit theories of sexual compatibility.

The "College Student Attitudes and Behaviors Survey" (developed by the authors) consists of 100 questions addressing beliefs, behaviors, and intentions related to marriage, family, and romantic relationships. In its most recent iteration, four items were replaced with new items that address assumptions about sexual compatibility (see Method section). Based on the types of items identified in the literature review that have corresponded with related models of implicit theories, we selected a variety background characteristics, beliefs, and experiences related to sexuality and romantic relationships. Our objective was to conduct an expansive investigation of constructs potentially associated with ITSC due to their relational or sexual nature, seeking to identify factors that contribute to how young adults think about sexual compatibility. The currents study can contribute to a greater understanding of the foundations of such ways of thinking.

Method

Participants

A sample was drawn from the 1,898 individuals who completed the survey between January 2022 to January 2023. Participants were from two large universities in the United States, one in the Southeast and the other in the Midwest; each university provided IRB approval for the study. Students at the two universities were emailed a link to an anonymous online questionnaire and asked to participate with no compensation. A total of 1,443 students completed data for all the variables of interest. Descriptive statistics for all variables, including sample characteristics, are reported in Tables 1 and 2.

Measures

Background variables

Background variables were coded for gender (*male, female, other*), race (*White, other*), and sexual identity (*heterosexual, other*). Race and sexual identity were collapsed because of the relatively homogenous distribution of sample characteristics. Current relationship status (*not dating or involved with anyone, casually dating more than one person, emotionally involved with one person*) was dichotomized (*in a relationship, not in a relationship*). Age was reported in years. Religiosity consisted of a single item on a 5-point Likert scale (*not at all religious, …very religious.*) Parental relationship status was dichotomized as "parents still together" (if parents were reported as *divorced* or *never married and not together*). Have cohabited was dichotomous (*yes/no*): "I have lived with a partner I was not married to." Five dichotomous items (*yes/no*) addressed whether the participant had been "pressured by a stranger to have sex," "pressured by a dating partner to have sex," "in an emotionally abusive relationship with a partner," "in a physically abusive relationship

with a partner," and "cheated (had oral sex or sexual intercourse) on by a partner." Scores for the five items were added to create a relationship trauma scale (α =0.73).

Sexuality

A series of questions addressed various sexual behaviors and related issues. Masturbation experience was measured by the item "Regarding my masturbation habits, I" (have never masturbated, have masturbated once or twice (tried it), now masturbate a few times during the course of a year, now masturbate an average of once or twice a month during the course of a year, now masturbate an average of once a week during the course of a year, now masturbate an average of three times a week during the course of a year, now masturbate an average of once a day or more during the course of a year). Oral sex experience was measured by the item "Regarding my experience with oral sex, I..." (have never had oral sex, have had oral sex once or twice (tried it), occasionally have oral sex as part of a sexual encounter, have oral sex most of the time I have a sexual encounter). Intercourse experience was measured by the item "Regarding having sexual intercourse (penis in vagina), I..." (have never had sexual intercourse, have had sexual intercourse once or twice (tried it), occasionally have sexual intercourse as part of a sexual encounter, have sexual intercourse most of the time I have a sexual encounter). Casual sex was measured with three dichotomous items (ves/no) addressed whether the participant had "been in a 'friends with benefits' (having sex with a friend)," "hooked up (sex upon first time meeting each other)," and "had sex without love." Scores for the three items were added to create a casual sex scale ($\alpha = .81$). Number of lifetime sex partners was measured by the item "I have had sexual relations (intercourse or touching someone's genitals with mouth or other body parts) with this many different people over the years (*None*, 1, 2, ...30 or more). Have cheated on a partner was measured by the item "I have cheated (had oral sex or sexual intercourse) while I was involved with a partner" (yes/no). Lied about number of sex partners was measured by the item "I have lied to my partner about my number of previous sexual partners" (yes/no). Oral sex is not sex was measured by the item "Having sex is having sexual intercourse, not having oral sex" (yes/no).

Love and Relationship Beliefs

Several items focused on romantic beliefs about love and marriage. The following dichotomous items were dummy coded (1=yes, 0=no) with variable names following in parentheses: "I believe that a deep love can get a couple through any difficulty or difference" (Love is enough to triumph), "Love doesn't make sense, it just is" (Love just is), and "I believe that there is only one true love that never comes again" (One true love comes only once).

Several survey items captured experiences related to intimate relationships. Three items were responded to with a 5-point agreement scale (*strongly disagree*, ...*strongly agree*): "I have experienced love at first sight" (Experienced love at first sight), "I make relationship choices more with my heart than my head" (Relationship choices with heart), and "Couples need to live together before they marry to know what they are getting into" (Couples should cohabit to learn).

Implicit theories of sexual compatibility (ITSC)

Four items captured two distinct perspectives on sexual compatibility. These items intended to reflect the essences of fixed vs malleable theories as depicted in Knee' (1998) implicit theories on relationships. For the sake of brevity given the size of the survey, and to ensure a clear focus on the sexual compatibility domain, two items were created for each theory, using language consistent with Knee's measure. For the fixed ITSC, the items were as follows: "Couples are either sexually compatible or they are not (it's not something you can make happen)," and "The key to sexual satisfaction is to find someone with whom one is sexually compatible." For the malleable ITSC, the two items were as follows: "Couples become more sexually compatible over time if they work at it," and "Achieving a sexually satisfying relationship is mostly about working hard to resolve sexual incompatibilities." Response options for these four items were *Strongly disagree, Disagree, Neither agree or disagree, Agree, Strongly agree.*

A Principal Components Factor Analysis with Varimax rotation verified a twofactor structure, with the two fixed items loading at 0.80 and 0.85 respectively, and the two malleable items loading at 0.75 and 0.84 respectively. The two fixed items were significantly correlated (r=.41, p<.001) and scaled together to form the fixed theory, and the two malleable items were significantly correlated (r=.32, p<.001) and scaled together to form the malleable theory. As seen in Table 1, the two theories were modestly and negatively correlated (r=-.19, p<.001).

Results

Descriptive Analyses

Descriptive statistics revealed that the average scores for each implicit theory were just above the midrange (3) of their 5-point scales and that the malleable theory had slightly more support than the fixed theory. The fixed theory mean score was 3.33 with most scores falling between 2.53 and 4.14 (one standard deviation from the mean). The skewness and kurtosis values were -0.21 and 0.11 respectively, indicating a normal distribution of scores. The malleable theory means score was somewhat higher at 3.67 with most scores falling between and 2.96 and 4.38. The skewness and kurtosis values were -0.45 and 0.11 respectively, indicating a normal distribution of scores. To investigate the possibility of some participants endorsing both theories at the same level, frequency analyses indicated that only one participant disagreed with all four ITSC items and 77 (5.3%) either disagreed or had a neutral score for the four items. Conversely, 181 (12.5%) agreed with all four items and 759 (52.6%) either agreed or had a neutral score for the four items.

Bivariate Analyses

Various background, sexuality, and love/relationship beliefs associated with each of the implicit theories of sexual compatibility, though more frequently with the fixed

Table 1 Bivariate correlations and descriptive statistics of all continuous variables (N = 1,443)	descriptive s	tatistics of	all continu	ous variable.	s (N=1,44	3)							
	1	2	3	4	5	6	7	8	6	10	11	12	13
1. Fixed	ı												
2. Malleable	-0.18^{***}	ı											
3. Age	0.04	0.01	ı										
4. Religious	0.13^{***}	0.01	0.05^{*}	,									
5. Relationship trauma scale	0.18^{***}	0.06^{*}	0.11^{***}	-0.10^{***}	ı								
6. Masturbation experience	0.04	0.08^{**}	0.15^{***}	-0.31^{***}	0.07^{*}	ı							
7. Oral sex experience	0.21^{***}	0.13^{***}	0.08^{**}	-0.16^{***}	0.37^{***}	0.18^{***}	ı						
8. Intercourse experience	0.25^{***}	0.08^{**}	0.11^{***}	-0.12^{***}	0.40^{***}	0.11^{***}	0.69^{***}	ı					
9. Casual sex scale	0.26^{***}	0.04	0.17^{***}	-0.10^{***}	0.48^{***}	0.19^{***}		0.52^{***}	ı				
10. Number of lifetime sex partners	s 0.20 ^{***}	0.06^{*}	0.22^{***}	-0.10^{***}	0.45^{***}	0.18^{***}	0.42^{***}	0.42^{***}	0.65^{***}	ı			
11. Experienced love at first sight	0.12^{***}	0.10^{**}	0.00	0.03	0.14^{***}	0.04			0.07^{**}	0.08^{**}	ı		
12. Relationship choices with heart	0.11^{***}	0.01	-0.03	-0.01		0.00	0.14^{***}	0.15^{***}	0.10^{***}	0.07^{**}	0.16^{***}		
13. Couples should cohabit to learn	ı 0.31 ^{***}	0.04	0.07^{**}	*		0.24^{***}	0.20^{***}	0.21^{***}	0.18^{***}	0.15^{***}	0.02	0.07^{**}	ı
M	3.33	3.67	19.80	2.46	1.50	4.18	2.69	2.67	1.09	3.93	2.55	3.36	3.78
SD	0.81	0.71	1.77	1.39	1.55	1.73	1.20	1.31	1.22	5.67	1.24	1.02	1.09
p < .05, *p < .01, **p < .001													

theory (Tables 1 and 2). Because of the number of statistical comparisons in the analyses, the false discovery rate of statistical differences was adjusted using the Benjamin-Hochberg procedure (Benjamin & Hochberg, 1995). This procedure ranks all the p values from low to high, then for each one divides its ranking number by the total number of p values, then multiplies that number by an acceptable false discovery rate—in this case 5%—to create a more conservative p value for establish statistical significance. The largest original p value that is lower than the adjusted p value is considered statistically significant, as are all original p values with lower rankings. For example, the 24 p values in Table 2 were rank ordered and the 11th smallest p value (0.004) was the largest p value lower than its adjusted p value (0.022), and thus the lowest 11 original p values were considered statistically significant at the 0.05 level.

Those respondents who more strongly endorsed the fixed theory tended to be religious, be female, have divorced parents, have cohabited, have experienced relationship trauma, have cheated on a partner, have had more sexual experience (masturbation, oral sex, intercourse), have scored higher on the casual sex scale, have a greater number of lifetime sexual partners, have lied about number of sex partners, believe oral sex is not sex, have experienced love at first sight, make relationship decisions with their heart (instead of head), believe love just is (it doesn't make sense), believe that one true love comes only once, and believe that couples should cohabit to prepare for marriage.

Respondents who more strongly endorsed the malleable theory tended to be male, in a relationship, have experienced relationship trauma, have had more sexual experience (masturbation, oral sex, intercourse), have a greater number of lifetime sexual partners, have lied about number of sex partners, have experienced love at first sight, believe love is enough to triumph, and believe that couples should cohabit to prepare for marriage. Several of these variables (relationship trauma, intercourse, lifetime partners, and believing in cohabitation) associated the same way with both theories but appeared to associate more strongly with the fixed theory. Age, race, and sexual orientation were not associated with either of the implicit theories.

Multivariate Analysis

While accounting for intercorrelations among predictor variables, the fixed and malleable theories no longer shared common associations (or the same direction of association) among the variables, and the variables explained much more variance in the fixed theory than in the malleable theory. Specifically, hierarchical multiple regressions analyzed associations between groups of variables and each of the implicit theories (Table 3). As with the tests reported in Table 2, the false discovery rate of statistical differences was adjusted using the Benjamin-Hochberg procedure—the *p* values in each column (model) were rank ordered and compared with adjusted *p* values (Benjamin & Hochberg, 1995). For the fixed theory [F(24, 1418)=14.97, p<.001], the background block of variables were statistically significant [F(10, 1432)=11.45, p<.001]. The R² change by adding the sexuality block of variables was also statistically significant [F(8, 1424)=10.69, p<.001], and being heterosexual, having married parents, and relationship trauma were no longer statistically significant in

		Fixed		Malleab	le
	%	М	t/F	M	t/F
Gender			14.35***		0.85
Male	23.1	3.17		3.72	
Female	67.4	3.41		3.66	
Other	9.5	3.15		3.66	
Race			1.4		1.31
White	80.7	3.38		3.65	
Other	19.3	3.32		3.71	
Sexual orientation			-0.21		-0.47
Heterosexual	62.2	3.32		3.67	
Other	37.8	3.35		3.66	
Parents still together			3.55***		-0.08
Yes	58.6	3.28		3.67	
No	41.4	3.40		3.67	
In a relationship			0.18		-3.91***
Yes	52.8	33.3		3.74	
No	47.2	33.4		3.59	
Have cohabited			-2.89**		-1.98
Yes	17.2	3.48		3.73	
No	82.8	3.31		3.66	
Have cheated on a partner			-3.66***		-1.41
Yes	8.2	3.56		3.75	
No	91.8	3.31		3.66	
Lied about # sex partners			-6.00***		-2.98**
Yes	11.9	3.61		3.80	
No	88.1	3.30		3.65	
Oral sex is not sex			-5.54***		-0.04
Agree	43.4	3.44		3.68	
Disagree	56.6	3.25		3.66	
Love is enough to triumph			-0.70		-4.21***
Agree	71.6	3.34		3.73	
Disagree	28.4	3.23		3.52	
Love just is			-5.48***		0.73
Agree	72.8	3.40		3.66	
Disagree	27.2	3.15		3.70	
One true love comes only once			-4.65 ***		-1.65
Agree	79.2	3.52		3.74	
Disagree	20.8	3.28		3.66	

 Table 2 Descriptive statistics and t-Tests for categorical variables by implicit theories (N=1,443)

Note All statistically significant differences were adjusted with the Benjamin-Hochberg procedure *p < .05, **p < .01, ***p < .001

the expanded model. The R^2 change by adding the love/relationship beliefs block of variables was also statistically significant [F(6, 1418)=22.42, p<.001], and being religious was no longer statistically significant in the full model. Overall, in the full model, a higher endorsement of the fixed theory of sexual compatibility was predicted by being female, not being in a relationship, intercourse experience, casual

	Fixed			Malleabl	e	
	β	β	β	β	β	β
Background						
Age	0.00	-0.01	0.00	-0.01	-0.02	-0.01
Male	-0.10^{***}	-0.11^{***}	-0.12^{***}	0.07^*	0.03	0.01
Other Gender	-0.10^{***}	-0.08^{**}	-0.07^{*}	0.01	0.01	0.01
White	-0.03	-0.04	-0.04	-0.05	-0.05	-0.05
Religious	-0.16^{***}	-0.11^{***}	-0.02	0.01	0.04	0.03
Heterosexual	0.08^*	0.00	0.00	-0.02	-0.02	-0.03
Parents still married	-0.06^{*}	-0.03	-0.02	0.01	0.02	0.03
In a relationship	-0.05	-0.08^{*}	-0.08^{*}	0.10^{***}	0.08^{**}	0.06
Have cohabited	0.03	0.02	0.01	0.01	0.01	0.01
Relationships trauma scale	0.14^{***}	0.01	-0.01	0.06	0.02	0.01
Sexuality						
Masturbation experience		-0.01	-0.01		0.07	0.08
Oral sex experience		0.03	0.02		0.12^{**}	0.12^{**}
Intercourse experience		0.13***	0.10^{***}		-0.02	-0.02
Casual sex scale		0.12**	0.12***		-0.05	-0.05
Number of lifetime sex partners		-0.02	-0.03		-0.01	-0.01
Have cheated on a partner		0.00	-0.01		-0.01	-0.01
Lied about # sex partners		0.06	0.05		0.08^*	0.07
Oral sex is not sex		0.09^{**}	0.07^*		0.02	-0.02
Love/relationship beliefs						
Love is enough to triumph			-0.01			0.10^{***}
Love just is			0.10^{**}			-0.04
One true love comes only once			0.07^{*}			0.02
Experienced love at first sight			0.08^{*}			0.05
Relationship choices with heart			0.02			-0.01
Couples should cohabit to learn			0.25***			0.02
Model change in Adjusted R ²	0.07^{***}	0.12^{***}	0.19***	0.01^{*}	0.02^{**}	0.04^{***}

Table 3 Multiple regression analyses for implicit theories (N=1,443)

Note All statistically significant differences were adjusted with the Benjamin-Hochberg procedure **p*<.05, ***p*<.01, ****p*<.001

sex, believing oral sex is not sex, believing that love just is, believing that one true love comes only once, experiencing love at first sight, and believing that couples should cohabit.

For the malleable theory [F(24, 1418)=3.23, p<.001], the background block of variables were statistically significant [F(10, 1432)=2.73, p<.01]. The R² change by adding the sexuality block of variables was also statistically significant [F(8, 1424)=3.28, p<.01], and being male was no longer significant in the expanded model. The R² change by adding the love/relationship beliefs block of variables was also statistically significant [F(6, 1418)=3.84, p<.001], which had little effect on the statistical significance of the sexuality variables. Overall, in the full model, a higher endorsement of the malleable theory of sexual compatibility was predicted by having had more experience with oral sex and believing that love is enough to triumph.

Discussion

The concept of ITSC as measured in the current study appeared to have meaningful variation within the sample. The two theories largely functioned independently, meaning that participants could endorse or reject both theories at similar levels but could also highly favor one over the other. Knee et al., (2001) argued that seemingly contradictory implicit theories can also be seen as complementary. Thus, some individuals might believe that a substantive amount of sexual compatibility must naturally exist between partners for them to have the potential to become even more compatible with time and hard work. However, simultaneous disagreement with both the fixed and malleable theories is more difficult to interpret, and few participants (up to 5.3%) reported such a perspective. Interviewing people with distinct patterns of responses could illuminate how the items were interpreted and generate other insights regarding meanings of these theories.

Collectively, the predictor variables were much more relevant to the fixed theory than the malleable theory, explaining 19% and 4% of the respective variances. The belief that "couples need to live together before they marry to know what they are getting into" was the strongest predictor of the fixed theory, which captures a core sentiment to the test drive analogy. However, other researchers have noted that most cohabitors do not view their relationship as a test run for marriage (Horowitz et al., 2019), which might explain why that coefficient was not larger. This item was also irrelevant to the malleable theory, even in the bivariate analysis, which is understandable given that a malleable theory places little emphasis on having an inevitability revealed. Also, being less religious became irrelevant to the fixed theory once the love/relationship beliefs entered the regression, likely due to the strong negative association religiosity had with the belief about testing a relationship with cohabitation (r=-.42). Note also the slight propensity to not be in a relationship associating with the fixed theory (and the opposite for the malleable theory). Might it be the case that a sizable portion of individuals with the fixed mindset were uninvolved with anyone because they had experienced a breakup of a short-term relationship that failed to click right away? Such a pattern might decrease the odds of being in a relationship at any given time.

Being female was somewhat predictive of the fixed theory. Do young women and men think differently about sexual compatibility? Previous researchers have suggested that men and women differ in mate preferences related to sexuality based on evolutionary forces (e.g., parental investment theory; Mogiliski, 2021) or cultural sexual scripts (Simon & Gagnon, 1986). These perspectives suggest that women might be more cautious about the sexual nature of a given male partner which could encourage a test drive mentality assumed to minimize risks. For example, young college women might be on high alert amongst a reputed campus rape culture, being concerned about sexually aggressive or coercive young males who, as a group, tend to hold.

adversarial beliefs toward sex with women (Emmers-Sommer, 2014). Women also tend to have more sexual fantasies related to intimacy and mutuality whereas men tend to fantasize more about anonymous sex with young, attractive partners (Wilson et al., 2010)—that latter of which is easier to detect. Furthermore, interest in finding

a partner who can and is willing to facilitate a woman reaching orgasm might also be related to a testing mentality, given a common belief that female orgasms are more difficult to achieve than are men's orgasms (Séguin & Blais, 2021). However, Maxwell et al. (2017) found a tendency for women to endorse the growth view of the broader Implicit Theories of Sexuality (ITS), which brings up the question as to whether the narrower focus on sexual compatibility or the natures of the differing samples account for this seemingly divergent pattern. It is important to note that the gender association in the current study was small and might not directly relate to assumptions about compatibility.

A history of relationship trauma (e.g., pressure to have sex, emotionally/physically abusive relationship) was associated with the fixed theory on the bivariate level and in the first model of the regression (only background variables) but disappeared once the sexuality aspects were accounted for in the regression. In the correlation matrix, the relationship trauma scale was also strongly correlated with sexual behaviors (r=.37 to 0.48). Other research has also shown that a history of sexual trauma is associated with more casual sexual experience (Hall & Knox, 2013; Hartwick et al., 2007), perhaps as an attempt for some to cope with the pain of sexual victimization (Mathes & Mccoy, 2011). More extensive intercourse experience and higher levels of the casual sex scale were particularly associated with the fixed theory, including in the full regression model. Taken together, it appears that relationship trauma indirectly associated with the fixed theory in that it correlated with more sexual behavior. The traumatic experiences could also be partially captured in the sexual behavior variables (e.g., casually hooking up because of pressure by a stranger or a date), helping account for these associations. Similarly, not being religious became somewhat less associated with the fixed theory once the sexual variables entered the model, suggesting that some of the association with religion was indirect and reflected a more conservative sexual background.

Regarding the fixed theory, a plausible interpretation for the findings related to more extensive and especially casual sexual experiences is that having a fixed perspective on sexual compatibility contributes to the mindset that sexual experience with a variety of partners helps one learn about one's inherent preferences and style (Busby et al., 2023). With whom one engages sexually might seem less relevant than learning about oneself and the presumed stable sexual natures available in the population. However, one would then expect the number of lifetime sexual partners to be higher for those holding a fixed perspective—which was the case in the bivariate analysis but not the regression. Given that the number of lifetime partners correlates very highly with the casual sex scale (r=.65), it is possible that the casual nature of the sex between partners is more relevant to conclusions drawn about sexual compatibility. Alternatively, or perhaps simultaneously, a fixed perspective could be the result of extensive and especially casual sexual encounters. Casual encounters might be hit or miss when it comes to sexual chemistry, and such encounters might be too superficial to test for compatibility in the sense of concordance of sexual desires, expectations, preferences, and overarching perspective on sex in relationships. If individuals mistake sexual chemistry for sexual compatibility, they might thus conclude that sexual compatibility is fixed in nature-they experienced it in some encounters and not others. Longitudinal data would be necessary to establish the causal order and existence of such processes.

Oral sex was associated with both theories at the bivariate level, but only relevant in the regression for the malleable theory. One interpretation of this finding is that those with more of a growth orientation toward sexual compatibility might engage in oral sex while giving a seemingly less compatible relationship time to become more compatible. This would presume that people associate sexual compatibility more strongly with intercourse than oral sex—which would be unsurprising given the dominance of an intercourse-centric societal perspective (Turner et al., 2023). While there was a slight tendency for the belief that oral sex is not sex to associate more with the fixed theory, it is not clear whether the sample thought about the concept of sexual compatibility as pertaining more to intercourse than to oral sex. Knowing how respondents define sexual compatibility and weigh certain elements of the sexual relationship in that definition might help clarify how oral sex associates with ITSC.

Romantic relationship beliefs also tended to correspond more highly with the fixed rather than the malleable theory. Believing that love cannot be explained, one's true love only comes around once, and in experiencing love at first sight seem destiny-oriented (parallel to the destiny ITR; Knee, 1998). Fixed sexual compatibility can connote a sense of something out of one's control, which for some young adults could be part of a romantic notion of soul-mate (Franiuk et al., 2002). Yet, one romantic belief, that "a deep love can get a couple through any difficulty or difference" (Love is enough to triumph), was significantly associated with the malleable theory instead. Though this belief romanticizes the power of love, it also acknowledges a sense of overcoming differences, which is compatible with a growth or malleable mindset. As with sexual experiences, whether romantic beliefs inform or are informed by specific ITSC, or if they have a bidirectional or spurious association, is best tested through longitudinal methods. Overall, the current study suggests that broader belief systems related to love are relevant to implicit theories related to sexual compatibility.

Limitations and Implications for Future Research

ITSC were measured for the first time in the current study. Using only four items, two for each implicit theory, without validity testing with other measures is less than ideal for establishing a new measure. A fuller investigation of measuring ITSC would foster more confidence in research findings using such a measure. The advantage, however, of this short measure is that the narrow focus on sexual compatibility is not lost through adding more items with unique wording that potentially broaden its scope. Having clear domains among implicit theories improves their functionality in research (Knee et al., 2003; Muise & Impett, 2015; Rydell et al., 2007). Nevertheless, using an ITSC measure with other related implicit theories measures could result in a proven measure that clearly represents a unique but interrelated construct of ITSC.

Of course, the limits of a convenience sample also apply to the current study, especially when a relatively small fraction of the students who were emailed chose to participate in the study. Participants motivated to share their beliefs about relationships and sexuality might differ in nuanced ways from the broader student population. Furthermore, the sample somewhat overrepresented White, female, and younger students within their institutions, possibly skewing results toward such demographics. A randomly-selected national sample of young adults would be ideal for maximum generalizability. As noted, the cross-sectional nature of the study limits the ability to determine the potential causal ordering of constructs, leaving the meaning of associations ambiguous. Future longitudinal research addressing ITSC-related processes would be ideal.

As the first study addressing ITSC, however, the findings suggest that further investigation of this construct has potential to distinguish meaningfully different types of assumptions about sexual compatibility that could be formed through distinct types of experiences and socialization. As with other types of implicit theories, it seems likely that ITSC are also predictive of future decisions and behaviors that ultimately contribute to healthy relationships and personal well-being. If ITSC indeed have such influence, the current study preliminarily identified some variables that could be important to address when seeking to understand why people adhere to a certain ITSC and what might prompt them to question and modify their beliefs in ways that will have been shown to work to their benefit. Efforts to "test drive" a relationship might be more fruitful as young adults know what to look for and have perspectives that motivation them to work through questionable incompatibilities to improve their relationships. Various studies have shown that priming people toward holding fixed or malleable implicit theories can shape other perceptions and intentions (e.g., Chen et al., 2012; Hong et al., 1999; Thompson et al., 2020), suggesting that understanding potential environmental primers on implicit theories has potential to know what to target in an effort to cultivate helpful thinking.

Acknowledgements All authors contributed to the study conception and design. Material preparation and data collection were performed by all authors and analysis were conducted by Scott Hall. The first draft of the manuscript was written by Scott Hall and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript. This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the East Carolina University & Medical Center Institutional Review Board (1/3/22, #15-001062) and the Ball State University Institutional Review Board (12/16/21, #1849385-1).

Funding The authors have no relevant financial or non-financial interests to disclose.

Declarations

Informed Consent was obtained from all individual participants included in the study.

References

- Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society*, 57, 289–300.
- Bohns, V. K., Scholer, A. A., & Rehman, U. (2015). Implicit theories of attraction. Social Cognition, 33(4), 284–307.
- Busby, D. M., Carroll, J. S., & Willoughby, B. J. (2010). Compatibility or restraint? The effects of sexual timing on marriage relationships. *Journal of Family Psychology*, 24, 766–774.

- Busby, D. M., Spencer, S., Butler, M. H., & Anderson, S. R. (2023). Sexual beliefs in couple relationships: Exploring the pathways of mindfulness, communication, and sexual functioning on sexual passion and satisfaction. *Family Process*, e12917.
- Chen, W. W., & Wu, C. W. (2023). The potential origins and consequences of Chinese youths' faith in love: Filial piety, implicit theories of romantic relationships, and intimacy. *Journal of Family Studies*, 29(2), 543–554. https://doi.org/10.1080/13229400.2021.1944276.
- Chen, W.-W., & Wu, C.-W. (2023). The potential origins and consequences of Chinese youths' faith in love: Filial piety, implicit theories of romantic relationships, and intimacy. *Journal of Family Studies*, 29(2), 543–554.https://doi.org/10.1080/13229400.2021.1944276
- Chen, Z., DeWall, C. N., Poon, K. T., & Chen, E. W. (2012). When destiny hurts: Implicit theories of relationships moderate aggressive responses to ostracism. *Journal of Experimental Social Psychology*, 48(5), 1029–1036. https://doi.org/10.1016/j.jesp.2012.04.002.
- Dweck, C. S., Hong, Y., & Chiu, C. (1993). Implicit theories: Individual differences in the likelihood and meaning of dispositional inference. Personality and Social Psychology Bulletin, 19, 644–656.
- Emmers-Sommer, T. (2014). Adversarial sexual attitudes toward women: The relationships with gender and traditionalism. Sexuality & Culture, 18(4), 804–817. https://doi.org/10.1007/s12119-014-9222-9.
- Franiuk, R., Cohen, D., & Pomerantz, E. M. (2002). Implicit theories of relationships: Implications for relationship satisfaction and longevity. *Personal Relationships*, 9(4), 345–367. https://doi. org/10.1111/1475-6811.09401.
- Hall, S. S. (2012a). Implicit theories of the marital institution: Associations and moderation. Family Science Review, 17, 1–17.
- Hall, S. S. (2012b). Implicit theories of the marital institution. Marriage & Family Review, 48, 1-19.
- Hall, S. S., & Knox, D. (2013). A profile of double victims: Sexual coercion by a dating partner and a stranger. *Journal of Aggression Maltreatment & Trauma*, 22(2), 145–158. https://doi.org/10.1080/1 0926771.2013.743940.
- Hall, S. S., Knox, D., & Shapiro, K. (2017). I have, I would, I won't: Hooking up among sexually diverse groups of college students. *Psychology of Sexual Orientation and Gender Diversity*, 4, 233–240.
- Hartwick, C., Desmarias, S., & Hennig, K. (2007). Characteristics of male and female victims of sexual coercion. *Canadian Journal of Human Sexuality*, 16, 31–44.
- Hong, Y., Chiu, C., & Dweck, C. S. (1995). Implicit theories of intelligence: Reconsidering the role of confidence in achievement motivation (pp. 197–216). In M. Kernis (Ed.), Efficacy, agency, and selfesteem. New York: Plenum
- Hong, Y., Chiu, C., Dweck, C. S., Lin, D. M. S., & Wan, W. (1999). Implicit theories, attributions, and coping: A meaning system approach. *Journal of Personality and Social Psychology*, 77, 588–599.
- Horowitz, J. M., Graf, N., & Livingston, G. (2019, November 6). Marriage and cohabitation in the U.S. Pew Research Center's Social & Demographic Trends Project. https://www.pewresearch.org/ social-trends/2019/11/06/marriage-and-cohabitation-in-the-u-s/.
- Knee, C. R. (1998). Implicit theories of relationships: Assessment and prediction of romantic relationship initiation, coping, and longevity. *Journal of Personality and Social Psychology*, 74(2), 360.
- Knee, C. R., & Petty, K. N. (2013). Implicit theories of relationships: Destiny and growth beliefs. In J. A. Simpson, & L. Campbell (Eds.), *The Oxford handbook of close relationships* (pp. 183–198). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780195398694.013.0009.
- Knee, C. R., Nanayakkara, A., Vietor, N. A., Neighbors, C., & Patrick, H. (2001). Implicit theories of relationships: Who cares if romantic partners are less than ideal? *Personality and Social Psychology Bulletin*, 27(7), 808–819. https://doi.org/10.1177/0146167201277004
- Knee, C. R., Patrick, H., & Lonsbary, C. (2003). Implicit theories of relationships: Orientations toward evaluation and cultivation. *Personality and Social Psychology Review*, 7, 41–55
- Knee, C. R., Patrick, H., Vietor, N. A., Nanayakkara, A., & Neighbors, C. (2002). Self-determination as growth motivation in romantic relationships. *Personality and Social Psychology Bulletin*, 28, 609–619.
- Larson, J. H., & Lamont, C. (2005). The relationship of childhood sexual abuse to the marital attitudes and readiness for marriage of single young adult women. *Journal of Family Issues*, 26(4), 415–430.
- Mathes, E. W., & Mccoy, J. (2011). Perpetration of sexual coercion and victim of sexual coercions scales: Development and validation. *Psychological Reports*, 108, 449–469.
- Mattingly, B. A., McIntyre, K. P., Knee, C. R., & Loving, T. J. (2019). Implicit theories of relationships and self-expansion: Implications for relationship functioning. *Journal of Social and Personal Relationships*, 36(6), 1579–1599. https://doi.org/10.1177/0265407518768079.

- Maxwell, J. A., Muise, A., MacDonald, G., Day, L. C., Rosen, N. O., & Impett, E. A. (2017). How implicit theories of sexuality shape sexual and relationship well-being. *Journal of Personality and Social Psychology*, 112(2), 238.
- Miles, N. J., & Servaty-Seib, H. L. (2010). Parental marital status and young adult offspring's attitudes about marriage and divorce. Journal of Divorce & Remarriage, 51(4), 209–220.
- Mueller, C. M., & Dweck, C. S. (1998). Praise for intelligence can undermine children's motivation and performance. *Journal of Personality and Social Psychology*, 75(1), 33.
- Muise, A., & Impett, E. A. (2015). Good, giving, and game: The relationship benefits of communal sexual responsiveness. *Social Psychological and Personality Science*, 6, 164–172. https://doi. org/10.1177/1948550614553641.
- Nekoolaltak, M., Keshavarz, Z., Simbar, M., Nazari, A. M., & Baghestani, A. R. (2020). Sexual compatibility with spouse questionnaire: Development and psychometric property evaluation. *International Journal of Community Based Nursing and Midwifery*, 8(3), 220.
- Rydell, R. J., Hugenberg, K., Ray, D., & Mackie, D. M. (2007). Implicit theories about groups and stereotyping: The role of group entitativity. *Personality and Social Psychology Bulletin*, 33, 549–558. https://doi.org/10.1177/0146167206296956.
- Séguin, L. J., & Blais, M. (2021). The development and validation of the orgasm beliefs inventory. Archives of Sexual Behavior, 50(6), 2543–2561. https://doi.org/10.1007/s10508-021-01911-2.
- Simon, W., & Gagnon, J. H. (1986). Sexual scripts: Permanence and change. Archives of Sexual Behavior, 15(2), 97–120. https://doi.org/10.1007/bf01542219.
- Thompson, A. E., Capesius, D., Kulibert, D., & Doyle, R. A. (2020). Understanding infidelity forgiveness: An application of implicit theories of relationships. *Journal of Relationships Research*, 11, e2. https:// doi.org/10.1017/jrr.2019.21.
- Turner, G., Pelts, M., Frabotta, R., & Paceley, M. S. (2023). They were the best and the worst of times: Reflections illuminate emerging adults' sexual experiences. *Sexuality Research & Social Policy: Journal of NSRC: SR & SP*. https://doi.org/10.1007/s13178-023-00865-5.
- Willoughby, B. J., Hall, S. S., & Goff, S. (2015). Marriage matters but how much? Marital centrality among young adults. *The Journal of Psychology*, 149, 796–817. https://doi.org/10.1080/00223980 .2014.979128.
- Wilson, G. D. (2010). The sex Fantasy Questionnaire: An update. Sexual and Relationship Therapy: Journal of the British Association for Sexual and Relationship Therapy, 25(1), 68–72. https://doi. org/10.1080/14681990903505799.

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Statements and Declarations The authors declare that no funds, grants, or other support were received during the preparation of this manuscript.

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.