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You make all things special: Developing a scale to measure sympathetic magic in romantic relationships

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Abstract

This paper describes the development and construct validation of the Romantic Sympathetic Magic Scale (RSMS). The scale measures individual differences in directing attachment behavior toward inanimate objects associated with one's partner. We offer a theoretical basis for such behavior in the concept of sympathetic magic and test the motivational and cognitive factors involved in this tendency. Finally, we differentiate romantic sympathetic magic from similar concepts. Three studies ($N = 851$) showed that RSMS is related to increased experientiality as well as to motivation to increase closeness to one's partner. The RSMS is related to, but substantially different from, paranormal beliefs, anthropomorphism for gadgets, and an overall attachment to inanimate objects. The distinctive feature of romantic sympathetic magic is that it applies specifically to objects associated with people's loved ones and its function is to facilitate a perceived connection with them. This research contributes to our understanding of the correspondence between personal relationships and emotional connection to inanimate objects.

Keywords romantic relationship · sympathetic magic · inanimate object · keepsake · individual differences

The closer our relationships are with objects, the closer our relationships are with people.

Daniel Miller (2008, p. 1)

What can we learn about an individual from his or her relationship to material possessions? To answer this question, anthropologists—Daniel Miller and Fiona Parrot (Miller 2008)—interviewed residents of a random street in South London, analyzing how belongings reflect the personality and life history of their owners. As a result, the authors created portraits of people whose relationships to things varied widely: from complete detachment, through instrumental use of artifacts, to one noticeable instance of a profound and intimate attachment of an owner to his or her cherished possession. To some people, inanimate objects such as photographs, jewelry, clothes, and family keepsakes are much more than mere representations or recollections of their loved ones. Symptomatically, Miller (2008) observed that the closer the connection between people, the closer the

relationship to objects associated with those people. Yet, in psychology, there is surprisingly little empirical support for this effect. Recent studies have even demonstrated the opposite, showing that the more people's loved ones are unreliable and disappointing, the more their attachment is redirected toward inanimate objects (Keefer et al. 2012; Pieters 2013). This paper aims to provide a theoretical and empirical understanding of the processes involved in attachment to inanimate objects that parallels the maintenance of closeness in social relationships.

We propose that the sympathetic magical thinking (Frazer 1925; Rozin and Nemeroff 2002) involved in the perception of inanimate objects associated with one's romantic partner elicits a sense that these objects contain some qualities of the partner. Thus, the more people need to be close to their partner, the more they seek both the person and—when he/she is unavailable—inanimate objects associated with him/her. Building on the concept of sympathetic magic, we developed a brief measure of individual differences in directing attachment behavior toward inanimate objects associated with one's romantic partner (the Romantic Sympathetic Magic Scale, RSMS). Next, we tested our theoretical predictions by demonstrating that the RSMS has both cognitive and motivational antecedents. Finally, we differentiated romantic sympathetic magic from similar phenomena: acceptance of paranormal beliefs, anthropomorphism, and overall attachment to material objects.

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What is Romantic Sympathetic Magic?

As one of the forms of magical causation, sympathetic magic (SM) represents the belief that certain objects or events affect one another in a non-physical way, through similarity or contagion (Subbotsky 2010); these latter are the two laws of SM. According to the law of similarity, similar objects share the same essence (Rozin and Nemeroff 2002). That is, an object, for example a photograph, may be perceived as containing qualities of the person photographed, and thus the photograph is experienced as if it actually was the person. In the context of romantic relationships, this law may promote talking to or kissing a photograph of one's partner. The law of contagion holds that physical contact results in the transfer of an essence between objects; the qualities exchanged may be physical or mental, and negative or positive in valence (Rozin and Nemeroff 2002). According to this rule, material objects that have been in contact with a loved one may become positively contaminated by that person's essence. Behavioral indices of this law might include cuddling up or sleeping with a partner's clothes.

Although a measure of romantic SM has already been formulated (Niemyjska 2015), it has two serious shortcomings. First, its psychometric parameters have never been formally evaluated. Second, it confounds magical thinking with its beneficial effects. Statements such as: "The mug I got from my partner makes all my drinks have a special effect on me," or "A gift from my partner works as a talisman to bring me luck," may invoke both a magical association between one's partner and certain inanimate objects, and positive effects of the inanimate objects on the person. Therefore, using this scale may increase a risk of artefactual beneficial effects of romantic SM. In this paper, we present a revised measure of romantic SM that detects nothing more than attachment behaviors directed toward inanimate objects associated with a loved one.

According to Nemeroff and Rozin (2000), magical responses can range from implicit beliefs experienced as a spontaneous, intuitive sense of connection between things, all the way to an explicit and rationalized system of beliefs in such a connection. Throughout this paper, the term "romantic SM" refers to behaviors directed toward inanimate objects associated with one's romantic partner, indicating that people transfer some qualities of their partner onto material objects. We think that people may display such behaviors without acknowledging that there is anything irrational or "magical" in doing so. Therefore, instead of asking about explicit beliefs, we focused on implicit beliefs revealed through behaviors.

In the next two sections, we explain how the theoretical basis of the concept of SM enables us to construct hypotheses about the cognitive and motivational factors involved in directing attachment behavior toward inanimate objects associated with one's partner.

Cognitive Antecedents of Romantic SM

For some, the most discernible feature of SM is its scientific impossibility, i.e., its violation of generally accepted, ontological knowledge about the world (Lindeman and Svedholm 2012). Much attention has been paid to the cognitive foundation of paranormal, superstitious, magical, and supernatural (PSMS) beliefs.

Applying a dual processing account (Evans 2008) to understand individual differences in PSMS beliefs, researchers have repeatedly shown that these beliefs are linked to intuitive thinking (System 1 processes; Epstein et al. 1996; King et al. 2007; for a review, see Risen 2016), which is fast and experiential and formed of hunches and feelings rather than thinking. Similarly, SM is often described as a "cognitive intuition" (Nemeroff and Rozin 2000, s. 5) or "heart-over-head" reaction (Rozin et al. 2007). It should be noted that SM and paranormal beliefs are not always directly linked to experiential processing. King et al. (2007) have shown that increased SM, as well as beliefs in UFOs and ghosts, are predicted by dispositional experientiality only when individuals experience positive affect.

Finally, since it is assumed that the experiential system is the natural, default mode for responding to situations (Epstein et al. 1996), it is not surprising that people appear to be naturally biased (Haselton and Nettle 2006) to accept SM at a relatively unconscious level, as indicated by physiological arousal (Hood et al. 2010), even when it contradicts actual behavior. Given that magical intuitions are formed effortlessly by System 1 processes (Risen 2016), we expected that experiential processing (Pacini and Epstein 1999) would predict increased levels of romantic SM.

Analytical thinking (System 2 processes), the rational, rule-based, and systematic mode of thinking, seems to be more indirectly, but still observably (Svedholm and Lindeman 2013; for a review, see Risen 2016; cf. King et al. 2007), involved in PSMS beliefs. The lack of systematic and strong evidence of a link between analytical thinking and PSMS beliefs (e.g., King et al. 2007) could be due to its interaction with intuitive processes. However, it may also be the result of methodological issues (Svedholm and Lindeman 2013). So, how does rational processing affect magical thinking?

According to the default-interventionist dual-processes account (Evans 2008; Risen 2016), System 1 processes cue default intuitive judgments that are monitored by System 2, which may or may not correct the initial intuition. In other words, SM can affect behavior directly unless inhibited or altered by analytic reasoning (Evans 2008). Importantly, Risen (2016) suggests that when detected by System 2, magical intuitions are not necessarily corrected. System 2 may often endorse SM even though it "knows" that the intuition is erroneous. In other words, "people can be aware that they are not being rational, but acquiesce to a powerful intuition

nevertheless" (Risen 2016, p. 194). Therefore, we expected that compared with rational thinking, experiential thinking would be more strongly linked to romantic SM because it directly determines magical intuitions, whereas rational reasoning accounts for facultative-correction operations.

Motivational Antecedents of Romantic SM

That SM may express biased thinking that is beneficial for one's motivation (for a discussion of the functional rationality of SM, see Haselton and Nettle 2006) has rarely been addressed by the literature. Expanding Malinowski's claim that magic is derived from "affirming man's autonomous power of creating desired ends" (1974, p. 76), we propose that romantic SM helps to satisfy a need for closeness.

Because the encoding of an object's qualities as we perceive them is often an active and constructive process in which top-down operations are an essential element (Balcetis and Dunning 2006), we argue that an unsatisfied need for closeness may alter the way that people perceive material possessions associated with their loved ones. Studies of motivated reasoning (e.g., Dawson et al. 2002) suggest that an option that is relevant to one's current motivation (e.g., fulfilling the need for a sense of belonging with a romantic partner) is held to a lower standard of scrutiny than an option would be that opposes this motivation. As a result, in the absence of the target object (i.e., a romantic partner) people may be motivated to maintain a sense of connection, which may lead them to objects associated with the target person and specifically to material possessions believed to contain the target person's essence (qualities of the partner him/herself).

Indeed, Niemyjska et al. (2011) showed that anxiously attached individuals attempting to minimize distance from a partner, either through clinging or controlling behaviors (Mikulincer et al. 2003), displayed increased levels of romantic SM. In contrast, avoidant individuals, who exhibited constant inattention to relational cues along with literal and symbolic distancing of themselves from distressing intimacy (Mikulincer et al. 2003), displayed decreased levels of romantic SM. In this research, we expected to replicate previous findings (Niemyjska et al. 2011) by showing that anxious attachment would positively predict romantic SM while avoidant attachment would negatively predict this tendency.

How does Romantic SM Differ from Similar Phenomena?

Paranormal Beliefs and Anthropomorphism As much as it violates fundamental principles of nature and science, romantic SM can appear synonymous with the anthropomorphism of inanimate objects typically encountered in a household

(Waytz et al. 2010) and with the more general phenomenon of paranormal beliefs (Tobacyk 2004). There are, however, consequential differences between these phenomena.

In contrast to paranormal beliefs and anthropomorphism, romantic SM is person-specific. Material possessions that become the objects of romantic SM represent one's romantic partner. The contents of paranormal beliefs comprise a wide range of phenomena (e.g., witchcraft, superstition, religious beliefs) that are irrelevant in the context of a romantic relationship. Similarly, anthropomorphism is the relatively broad tendency to imbue non-human agents, such as technological devices, with humanlike qualities: personality traits, intentions, and emotions (Epley et al. 2007). Consequently, we expect that only romantic SM would be related to the necessity of having a real object nearby that is associated with one's partner. Note that being in possession of an object is not an attachment behavior per se; consequently, it is not a direct indicator of romantic SM. Furthermore, we expect that compared with paranormal belief and anthropomorphism, only romantic SM is linked to a greater preoccupation with inanimate objects symbolizing a partner, and thus to better recall of a Christmas present received from one's partner.

Romantic SM differs from both anthropomorphism and paranormal beliefs. In SM the response is usually based on non-verbalized "gut feelings" (Rozin and Nemeroff 2002), whereas both anthropomorphism and paranormal beliefs reflect explicit beliefs (Tobacyk 2004). It is possible, therefore, that these phenomena are related not only to increased experientiality (as romantic SM is), but also to decreased rationality. Interestingly, both romantic SM (Niemyjska 2015) and anthropomorphism (Epley et al. 2007) may be elicited by loneliness. However, romantic SM maintains feelings of closeness to a specific person (a romantic partner), whereas anthropomorphism creates alternative, compensatory sources of support in non-human objects.

Summing up, we expect romantic SM to be positively correlated with both paranormal beliefs and the anthropomorphism of technological gadgets. However, unlike paranormal beliefs and anthropomorphism, it is also expected to be related to increased closeness in and satisfaction with relationships and a greater focus on collecting inanimate objects associated with one's partner.

Generalized Attachment to Inanimate Objects Given the behaviors that are indicative of romantic SM (i.e., acquiring and interacting with material possessions), romantic SM may also appear to share some features with a more general tendency to become attached to inanimate objects, such as that observed in compulsive hoarding (Frost and Steketee 2011; Nedelisky and Steele 2009). Yet, we argue that the distinctive feature of romantic SM is that it applies specifically to objects associated with people's loved ones and serves the function of facilitating a perceived connection with them. In contrast, attachment to

inanimate objects as a generalized reaction, as observed in compulsive hoarding, may be directed toward literally anything (from paper products such as newspapers, files, books, and magazines, to general clutter including unsorted items and broken objects; Frost and Steketee 2011; Nedelisky and Steele 2009).

Importantly, romantic SM and generalized attachment to inanimate objects differ substantially in terms of their potential contribution to the quality of close relationships. The generalized attachment to objects observed in hoarding leads to the breakup of couples and families rather than strengthening their connection (Büscher et al. 2014; Nedelisky and Steele 2009). Keefer et al. (2012) demonstrated that generalized attachment to inanimate objects is an autonomous source of comfort that compensates for the perceived unreliability of close others and is positively related to both increased attachment anxiety and avoidance. Based on these findings, we expected romantic SM to overlap with a generalized attachment to inanimate objects because both phenomena involve attachment to inanimate objects. Yet, unlike generalized attachment to inanimate objects, romantic SM facilitates the regulation of emotion in close relationships and thus is related to greater closeness to a partner. Finally, as discussed above romantic SM, unlike attachment to material objects, should predict the actual behavior of being in possession of an object associated with one's partner.

Aims and Expectations

The main aim of the current studies was threefold. First, it was to develop a brief measure of the tendency to employ romantic SM in the perception of material objects associated with one's romantic partner. Second, it was to confirm the construct validity of the newly developed scale by establishing its cognitive and motivational antecedents. Third, we aimed to confirm the discriminant validation of the Romantic Sympathetic Magic Scale (RSMS) by distinguishing romantic SM from similar phenomena, specifically paranormal beliefs (Studies 1 and 2), anthropomorphism of gadgets (Study 2), and generalized attachment to material objects as observed in compulsive hoarding (Study 3).

Regarding the cognitive and motivational antecedents of romantic SM, we expected that the RSMS would be explained by increased experiential processing (Studies 1 and 2) and a greater need for closeness indicated by high attachment anxiety and low attachment avoidance (Studies 1, 2, and 3). For discriminant validity, we expected that romantic SM, unlike paranormal beliefs, anthropomorphism, and hoarding, would be associated with increased closeness to one's partner (Studies 1, 2, and 3), more satisfaction with one's romantic relationship (Study 2), and the desire to have an object associated with one's partner nearby (Studies 1, 2, and 3).

Scale Development

Our goal was to develop a concise yet comprehensive measure of people's tendency to direct attachment behaviors toward inanimate objects associated with their romantic partners. As discussed earlier, we decided that our measure would identify spontaneous, implicit beliefs as revealed by behaviors indicative of SM (e.g., "Sometimes I say something to a photograph of my partner") instead of rationalized, explicit beliefs (e.g., "I believe that there is some essence of my partner in his/her photograph"). Based on previous studies of SM (e.g., Rozin et al. 2007), we assumed that magical intuitions were more likely to be expressed in behavioral acts than in judgments. Additionally, the rationale for this decision was based on previous studies (Rozin and Nemeroff 2002; Subbotsky 2010) showing that adults (especially those from Western, developed cultures) are motivated to present themselves as rational and highly educated. According to Subbotsky (2010, p. 51), "in their conscious judgments, most adults deny the reality of magic, yet in their subconscious reactions (..) they follow the laws of magical thinking." Therefore, to avoid eliciting elaborate thinking about SM we asked only about reactions to inanimate objects associated with people's partners due either to their similarity to their partner's image (e.g., photographs) or their having been in contact with their partner (gifts, partner's clothes). We assumed that people's consistency in displaying attachment-relevant social reactions to a specific kind of inanimate object would imply a tendency to use romantic SM.

Development of the RSMS started with the generation of a pool of 12 potential items describing attachment-relevant behaviors in close relationships (Fraley and Shaver 1998) that could be directed to inanimate objects associated with a partner (e.g., kissing, cuddling, caring for the object). In Study 1, we used this preliminary 12-item version of the scale. Items were rated on a five-point scale with the response categories: *yes!, somewhat yes, hard to say, somewhat no, no!*. Both exploratory and confirmatory factor analyses performed on this dataset (described in detail below) resulted in the final five-item version of the scale. Table 1 presents descriptive statistics for all the responses collected in the three studies informing the final version of the scale.

Study 1

In Study 1 we had four goals. First, we wanted to administer the pool of 12 potential SM items to a larger group of participants, so that the final scale items could be selected depending on their reliability and factor analysis. Second, we tested the cognitive and motivational antecedents of romantic SM. For the cognitive factors, we expected that romantic SM would be predicted by increased experiential processing. For

Table 1 List of RSMS items with their descriptive statistics in Study 1 ($N = 221$) as well as factor loadings in all the collected responses ($N = 851$)

No	Item	M	SD	Skewness	Kurtosis	Factor loadings in Study 1 ($N = 221$)	Factor loadings in all the collected responses ($N = 851$)
1	Sometimes I say something to a photograph of my partner.	1.87	1.24	1.30	.41	.58	.61
2	When I am away alone, I take a photograph or an item with me that reminds me of my partner.	2.79	1.53	0.16	−1.53	.65	.67
3	I like to cuddle up with my partner's clothes.	2.71	1.51	.28	−1.45	.62	.66
4	When I browse through pictures, I sometimes caress photos of my partner.	2.26	1.36	0.77	−.78	.67	.71
5	A gift from a loved one is much more than just an item, it is a part of the person himself\herself.	3.37	1.28	−0.45	−.96	.61	.57

the motivational factors, we hypothesized that romantic SM would be positively predicted by anxious attachment and negatively predicted by avoidant attachment. Third, we wanted to validate the hypothesis that the employment of romantic SM is distinguishable from paranormal beliefs. However, we expected that romantic SM would share some common cognitive antecedents with paranormal beliefs (i.e., experiential processing) but that paranormal beliefs would not be related to the quality of romantic relationship. Consequently, we hypothesized that romantic SM would be uniquely related to increased closeness to one's partner and owning a special object associated with him/her. Finally, 12 months after the initial survey we asked participants to complete the RSMS again, to check the test-retest reliability.

Method

Participants

Participants were 221 Polish adults, 181 women ($M_{age} = 28.8$; $SD = 9.4$), recruited via social media sites. All had partners, the mean length of their romantic relationship being 52 months ($SD = 62$). The survey consisted of two parts, both conducted online. At Time 1, participants were required to answer demographic questions and questionnaires that assessed romantic SM, experiential and rational processing, cognitive reflection, paranormal beliefs, and relationship closeness (with the order of the scales being rotated). At Time 2, participants completed only the demographic questions and the RSMS (retest). Participants who provided their e-mail addresses at Time 1 ($N = 199$) received a ticket to enter a raffle with popular books as the main prize. Twelve months after the initial survey (Time 2) we contacted these same participants and asked them if they were in the same relationship and if so whether they would complete the RSMS once again. This retest measurement was completed by 45 participants (37 females; $M_{age} = 33.1$; $SD = 9.5$).

Measures

Romantic SM The initial RSMS with 12 items was used on this sample. To examine the factor structure, we first performed exploratory factor analysis (EFA) using the maximum likelihood method. A unidimensional and a two-dimensional model including a division between the laws of contagion and similarity in the SM factor to explain the inter-correlations between items were then assessed using confirmatory factor analysis (CFA using AMOS 23).

Possession of a Special Inanimate Object Associated with one's Partner We used one question to assess whether participants used any objects relating to their loved ones on an everyday basis: "Do you usually carry with you something associated with your partner (e.g., his/her photograph or a gift from her/him)?" Participants provided a yes/no answer.

Experiential and Rational Processing The tendency to rely on experiential or rational thinking was assessed with the Rational-Experiential Inventory (Pacini and Epstein 1999). An overall Experientiality scale ($\alpha = .90$) was obtained by averaging the Experiential Ability and Experiential Engagement subscales. Similarly, an overall Rationality scale ($\alpha = .83$) was obtained by averaging the Rational Ability and Rational Engagement subscales. Answers were scored on a five-point scale ranging from 1 (*definitely not*) to 5 (*definitely yes*).

Paranormal Beliefs The Revised Paranormal Belief Scale (Tobacyk 2004) was used to assess subjects' beliefs in paranormal phenomena such as witchcraft, superstition, and spiritualism. Participants rated each item on a five-point scale ranging from 1 (*definitely not*) to 5 (*definitely yes*). The scale showed good internal reliability ($\alpha = .93$).

Attachment Anxiety and Avoidance Attachment insecurities were assessed with the 36-item ECR-R scale (Fraley et al. 2000). The scale assesses attachment anxiety and attachment avoidance. Responses ranged from 1 (*strongly disagree*) to 5

(*strongly agree*). Cronbach's αs were .91 for attachment anxiety and .89 for attachment avoidance.

Relationship Closeness Relationship closeness was measured with the Unidimensional Relationship Closeness Scale (URCS, Dibble et al. 2012). The scale consists of 12 items. Participants were asked to respond to each item with reference to their romantic partner. Responses ranged from 1 (*strongly disagree*) to 7 (*strongly agree*). Cronbach's α for URCS was high (α = .93).

Results and Discussion

Factor Structure of RSMS

On the basis of observations reported in the literature (e.g., Belk and Coon 1993; Frost and Steketee 2011; Miller 2008), we have assumed that due to a similar function for adults, that is, regulation of perceived closeness to a loved one (for a discussion on this topic, see Niemyjska 2015), both laws of SM operate together. Therefore, we expected a unidimensional structure of the RSMS. First, we checked whether scores are distributed normally. On this basis, two items had to be removed from the scale as their values for both skewness and kurtosis exceeded 1.5. Then, we tested whether RSMS formed a unidimensional construct. The remaining ten items were selected for EFA. Four items that loaded factors lower than 0.25 were excluded from the analyses, which left us with six items. The EFA of the six items revealed a unidimensional fit that explained 38% of the variance of this single factor. Next, confirmatory factor analysis was conducted investigating the fit of a one-factor vs two-factor model to responses on the six items; one model is preferable to another when $\chi2$ is insignificant. The goodness of fit for the unidimensional model ($\chi2$ (8) = 9.75; p = .28) was sufficiently better than that for the two-factor model ($\chi2$ (3) = 14.46; p = .002), thus the one-factor model was chosen for further analysis. However, one of the items had a much smaller, non-standardized loading (.30) and had to be removed to achieve goodness of fit for the resulting unidimensional five-item scale ($\chi2$ (4) = 1.24; p = .87; RMSEA = .00; CI [0,00; 0,01]; GFI = .98). The items and their descriptive statistics as well as loadings (in Study 1 and for responses collected in all three studies, N = 851) are summarized in Table 1. The final five-item RSMS showed satisfactory reliability of α = .76 and the test-retest reliability, despite being performed after an extremely long period of time, showed good stability over time, r (45) = .54; p < .001.

Preliminary correlational analyses showed that romantic SM was associated with none of the demographic characteristics (i.e., gender, age, education, or length of relationship). Table 2 shows correlations, means, and standard deviations of the measures used in this study.

Next, we conducted linear regression analyses to determine the contribution of the cognitive and motivational factors to the prediction of romantic SM. RSMS was regressed on experientiality, rationality, and anxious and avoidant attachment scores (see Table 3). As expected, experiential thinking (i.e., the associative process fueling System 1) was a stronger predictor for romantic SM (β = .20; p < .001) than was rational thinking (facultative-correction operations fueling System 2) (β = −.08; p = .25). Furthermore, romantic SM was predicted by both anxious (β = .26; p < .001) and avoidant (β = −.23; p = .001) attachment. This replicates previous findings (Niemyjska et al. 2011) showing anxious attachment to positively predict romantic SM and a negative association with avoidant attachment. This finding supports our claim that RSMS reflects an individual's need for closeness: it increases in anxious attachment, which denotes a dispositional hunger for closeness, and decreases in avoidant attachment, which minimizes intimacy and closeness.

Next, we checked whether romantic SM could be differentiated from the related phenomenon of paranormal beliefs, r (221) = .34, p < .01. To this end, two separate regression analyses were conducted where RSMS and the Paranormal Belief Scale were entered as predictors of relationship closeness and the necessity of having a real object nearby associated with a partner. As expected, divergent results were found for the variance in the relationship closeness measure—the Paranormal Belief Scale was unrelated to scores on the Relationship Closeness Scale (β = −.01; p = .88), whereas the Relationship Closeness Scale was significantly explained by the RSMS (β = .30; p < .001; F(2,218) = 9.92; p < .001). Similarly, the dichotomous measure of having an inanimate object nearby associated with one's partner was explained by the RSMS (β = .60; p < .001), but not by the Paranormal Belief Scale (β = −.07; p = .24; F(2, 218) = 57.99; p < .001).

In summary, in Study 1 we selected the best fitting five items to create the final version of the RSMS. This short instrument showed good psychometric properties, a unidimensional structure, and good stability over time. The RSMS was related to both cognitive factors (i.e., experiential information processing) and motivational factors (i.e., increased anxious attachment and decreased avoidance). The results showed that romantic SM not only reflected dispositional motivation to be close to one's partner (as indicated by certain attachment orientations), but was also related to actual level of relationship closeness. Furthermore, the RSMS largely predicted that if participants behaved according to the laws of SM, they carried with them inanimate objects related to their loved ones.

Finally, divergent validity was demonstrated by the different effects of the RSMS and the Paranormal Belief Scale. The Paranormal Belief Scale was not related to either relationship closeness or owning an object related to one's partner. The RSMS was a unique predictor of these measures. In our view, these results clearly show that while romantic SM does

Table 2 Means, standard deviations, and Pearson's r correlations of the measures used in Study 1

Measure	M	SD	1	2	3	4	5	6	7
1. RSMS	2.63	1.09							
2. Paranormal beliefs	2.18	.78	.40**						
3. Experientiality	3.31	.69	.22**	.45**					
4. Rationality	3.55	.59	−.08	−.07	.04				
5. Anxious attachment	2.18	.79	.18**	.19**	−.06	−.16*			
6. Avoidant attachment	2.05	.69	−.16*	−.04	−.17*	−.13	.36**		
7. Relationship closeness	5.65	1.16	.29**	.11	.17*	.14*	−.26**	−.72**	
8. Possession of an object	41%	–	.57**	.16*	.02	.03	.10	−.10	.15*

Possession of an object = % of participants whose answer was positive; * $p < .05$; ** $p < .01$

include some forms of ontological error in thinking, it is clearly distinct from paranormal beliefs and is more closely related to the motivational factors of seeking (and probably finding) connection to loved ones. This gives us initial proof that we are measuring a unique concept that is exclusively related to the use of the laws of SM in the context of romantic goals.

Study 2

In this study we wanted to replicate the correlational patterns from Study 1 using the English version of the scale. As discussed earlier, for cognitive factors we expected that romantic SM would be predicted by increased experiential processing; for motivational factors, we hypothesized that romantic SM would be positively predicted by anxious attachment and negatively predicted by avoidant attachment. Our second goal was to distinguish romantic SM from belief in the paranormal and anthropomorphism of technological devices. We predicted that romantic SM, unlike paranormal beliefs and anthropomorphism, would be associated with relationship quality measures such as increased closeness to one's partner and satisfaction with one's romantic relationship. Because in Study 1 the gender distribution was unbalanced, we made sure that participants here were balanced in terms of gender.

Method

Participants

Participants were 310 US and UK residents (185 women), recruited online via Prolific.ac.uk. The average age was 37 years ($SD = 11$). All were in a romantic relationship—133 had partners, 177 were married, and the mean length of romantic relationship was 130 months ($SD = 108$).

Procedure and Measures

Participants were asked to provide demographic information (gender, age, relationship status, and relationship duration) and to complete the questionnaire measures that we describe below (in a randomized order).

The five-item RSMS scale was translated into English by five researchers fluent in English. The translation was then verified through a back-translation procedure. The final English version of the RSMS again reached a good reliability, $\alpha = .80$ and the CFA of the one-factor model showed sufficient goodness of fit, $\chi2\ (3) = 9.87$; $p = .02$ (RMSEA = .08 (CI = .03; .15); CFI = .98). We used the same set of questionnaires as that used in Study 1: paranormal beliefs ($\alpha = .94$); experiential and rational processing ($\alpha = .92$); attachment

Table 3 Results of regression analysis on RSMS predicted by cognitive and motivational factors (Studies 1, 2, and 3)

Predictors	RSMS – polish version (Study 1; N = 221)			RSMS – english version (Study 2; N = 310)			RSMS – polish version (Study 3; N = 320)		
	B	SE	β	B	SE	β	B	SE	β
Experientiality	.32	.10	.20**	.19	.08	.14*	–		
Rationality	−.14	.12	−.08	.09	.08	.07	–		
Anxious attachment	.36	.10	.26**	.24	.04	.34**	.11	.04	.16**
Avoidant attachment	−.36	.11	−.23**	−.21	.05	−.24**	−.22	.04	−.27**
R^2			.13			.16			.10
F			8.30**			14.32**			17.71**

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

anxiety ($\alpha = .70$) and avoidance ($\alpha = .82$); and relationship closeness ($\alpha = .93$).

Anthropomorphism of Technological Devices The Individual Differences in Anthropomorphism Questionnaire (IDAQ, Waytz et al. 2010) identifies three classes of commonly anthropomorphized agents—non-human animals, natural entities, and technological devices. Because romantic SM operates on artifacts that are typically encountered in a household, we decided that the subscale measuring anthropomorphism of technological devices (computers, cars, televisions) would be the most comparable in terms of content. The subscale consists of five anthropomorphism-related questions and five filler questions. Participants scored their answers on a ten-point scale that ranged from 0 (*not at all*) to 10 (*very much*). Cronbach's α for this measure was high ($\alpha = .86$).
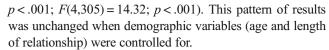
Relationship Satisfaction A one-item measure of relationship satisfaction was included. Participants rated their overall relationship satisfaction with the current partner on a scale that ranged from 1 (*not at all satisfied*) to 10 (*satisfied to a great extent*).

Preoccupation with Inanimate Objects Associated with one's Partner First, as in Study 1, we asked a yes/no-question about possession of an object associated with one's partner. Second, we asked participants whether they remembered the Christmas present they received from their romantic partner last year (2016; the study was conducted in June 2017). Response categories were: *Yes/No/Not applicable*. We expected that romantic SM would be related to both owning a special object associated one's partner and remembering the Christmas present received from him/her.

Results and Discussion

Preliminary correlational analyses showed that romantic SM was associated with age, $r(310) = -.22$; $p < .001$ and length of relationship, $r(310) = -.20$; $p < .01$. Thus, we controlled for these measures in further analyses. As in Study 1, romantic SM was not related to gender. Table 4 shows correlations, means, and standard deviations of the measures used in this study.

In correspondence with the analysis conducted in Study 1 (see Table 3), we ran a linear regression to assess the contribution of the cognitive and motivational factors in predicting romantic SM. For this purpose, RSMS scores were regressed on experientiality and rationality scores, and on anxious and avoidant attachment scores. The results were in agreement with the pattern obtained with the Polish sample. The RSMS was positively related to experientiality ($\beta = .14$; $p < .05$) and anxious attachment orientation ($\beta = .34$; $p < .001$), and negatively related to avoidant attachment orientation ($\beta = -.24$;

$p < .001$; $F(4,305) = 14.32$; $p < .001$). This pattern of results was unchanged when demographic variables (age and length of relationship) were controlled for.

As shown in Table 4, romantic SM was positively correlated with both paranormal beliefs, $r(310) = .31$; $p < .001$ and anthropomorphism, $r(310) = .26$; $p < .001$. To test whether it could be differentiated from these phenomena we conducted four separate regression analyses where the RSMS, the Paranormal Belief Scale, and the Anthropomorphism Scale were entered as predictors of relationship closeness, relationship satisfaction, the necessity of having a real object nearby associated with one's partner, and remembering a Christmas present from one's partner.

In line with our hypothesis and consistent with the results of Study 1, relationship closeness was positively related to romantic SM ($\beta = .35$; $p < .001$) and unrelated to paranormal beliefs ($\beta = .01$; $p < .92$). Anthropomorphism of technological devices, however was positively associated with the RSMS, but negatively linked to closeness in romantic relationship ($\beta = -.12$; $p < .05$; $F(3,306) = 13.46$; $p < .001$). The unique contribution of romantic SM was also observed in satisfaction with romantic relationship, which was positively predicted by romantic SM ($\beta = .17$; $p < .01$) but unrelated to both paranormal beliefs ($\beta = -.06$; $p = .31$) and anthropomorphism ($\beta = .06$; $p = .29$; $F(3,306) = 3.49$; $p < .05$). Finally, only romantic SM correlated positively with possession of an object related to one's partner, ($\beta = .45$; $p < .001$). Paranormal beliefs were not significantly related to this measure ($\beta = .08$; $p = .16$), whereas, anthropomorphism negatively predicted possessions of this kind of object ($\beta = -.15$; $p < .001$). Finally, remembering a Christmas present received from one's partner was linked to the RSMS ($\beta = .16$; $p < .05$) but unrelated to both paranormal beliefs ($\beta = -.06$; $p = .40$) and anthropomorphism ($\beta = .00$; $p = .99$). These results were also observed when age and length of the relationship were controlled for.

To sum up, the results indicate satisfactory cross-cultural equivalence for the RSMS. According to our findings, romantic SM in both Polish and UK & US samples was consistently explained by the same pattern of cognitive-motivational factors. More specifically, it was related to the motivation to be close to one's romantic partner (as indicated by increased attachment anxiety and decreased attachment avoidance) and increased experientiality. Last, but not least, we demonstrated that only romantic SM (i.e., not paranormal beliefs or anthropomorphism) was positively related to relationship quality measures and indices of preoccupation with inanimate objects symbolizing a partner.

Study 3

In Study 3 we wanted to further test the idea behind increased need for closeness as a motivational factor supporting the

Table 4 Means, standard deviations, and Pearson's r correlations of measures used in Study 2

Measure	M	SD	1	2	3	4	5	6	7	8	9	10
1. RSMS	2.41	.88										
2. Paranormal beliefs	2.77	1.21	.31**									
3. Anthropomorphism	1.30	1.89	.26**	.31**								
4. Experientiality	4.25	.62	.18**	.37**	.16**							
5. Rationality	4.84	.63	.05	−.18	−.20**	−.04						
6. Anxious attachment	3.42	1.23	.26**	.18	.25**	.03	−.21**					
7. Avoidant attachment	2.27	.99	−.18**	.05	−.24**	−.16**	−.24**	.30**				
8. Relationship closeness	6.06	.84	.32**	.08	−.03	.23**	.18**	−.11*	−.64**			
9. Relationship satisfaction	8.41	1.75	.17**	.01	.09	.17**	.06	−.21**	−.41**	.67**		
10. Possession of an object	49%	–	.43**	.17**	−.01	.14*	.09	.09	−.19**	.23**	.13*	
11. Memory of a christmas present	73%	–	.15*	−.01	.03	.17**	.14*	−.03	−.13*	.17**	.16*	.13*

For memory of a christmas present N = 283; Possession of an object and memory of a christmas present = % of participants whose answer was positive * $p < .05$; ** $p < .01$

RSMS. We also wanted to distinguish romantic SM from the generalized attachment to inanimate objects observed in hoarding. As discussed earlier, romantic SM and hoarding should be associated with different patterns of attachment orientation. Hoarding should be positively related to both increased attachment anxiety and avoidance (Keefer et al. 2012), while romantic SM should be linked to increased attachment anxiety and decreased attachment avoidance. What is more, we expected that romantic SM, unlike generalized attachment to inanimate objects, would be related to having a real object associated with one's partner nearby, as well as increased closeness to one's partner.

Method

Participants

Three hundred twenty Polish participants (M_{age} = 29.3; SD = 9.4) were contacted via social media sites (215 women). The mean length of their romantic relationship was 73 months (SD = 92). The majority of participants (52%) reported that they held a bachelor's or master's degree (n = 163), 41% had graduated from high school (n = 138), and 6% (n = 19) had not graduated from high school.

Procedure and Measures

Participants were asked to provide demographic information (gender, age, education, relationship status, and relationship duration) and to complete questionnaire measures in a randomized order. Romantic SM was assessed using the five-item RSMS (α = .80) described in Study 1. The fit for a unidimensional model was good $\chi2$ (4) = 4.26; p = .37 (RMSEA = .01; CI [0.0; 0.09]; CFI = .99). Possession of an

inanimate object associated with one's partner was assessed in the same manner as in Study 1. Attachment orientation was assessed with a shortened eight-item version of Fraley et al.'s (2000) ECR-R scale used in Study 1. The reliability of the scales was satisfactory, α = .75 for anxious attachment and α = .88 for avoidant attachment.

Object Attachment Generalized attachment to one's possessions was measured using a modified version of the Reciprocal Attachment Questionnaire (RAQ-A; Nedelisky and Steele 2009). The RAQ-A consists of 38 items that comprise key aspects of object attachment. Participants scored their answers on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). As in previous studies concerned with generalized object attachment (Keefer et al. 2012), we used composite scores based on averaged responses to all items (after reverse-scoring compulsive self-reliance; α = .84).

Relationship Closeness We used a single-item pictorial Inclusion of Other in the Self Scale (Aron et al. 1992) to assess the sense of being interconnected with one's partner. Participants were presented with seven pairs of circles overlapping to different degrees. They were asked to choose the picture that best described the closeness between them and their current romantic partner.

Results and Discussion

Preliminary correlational analyses showed that the RSMS was associated with the female gender, $t(318)$ = 3.23; p < .01. Thus, in further analyses we controlled for gender. Table 5 shows correlations, means, and standard deviations of the measures used in this study.

Table 5 Means, standard deviations, and Pearson's r correlations of measures used in Study 3

Measure	M	SD	1	2	3	4	5
1. RSMS	2.77	1.05					
2. Object attachment (RAQ-A)	2.45	.45	.13*				
3. Anxious attachment	3.67	1.47	.17**	.09			
4. Avoidant attachment	2.34	1.28	−.27**	.14**	-.05		
5. Relationship closeness	4.72	1.63	.36**	.03	−.11	-.40**	
6. Possession of an object	.42	.49	.54**	.12*	.09	-.22**	.28**

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

First, we examined whether the scores on the RSMS could be explained by a pattern of attachment orientations made up of increased anxiety and decreased avoidance. The RSMS was regressed on attachment orientation. As predicted (see Table 3), we replicated the pattern of results seen in Studies 1 and 2—the RSMS was significantly predicted by both anxious ($\beta = .16$; $p < .01$) and avoidant ($\beta = −.27$; $p < .001$) attachment orientations. These motivational factors significantly explained 10% of the variance in RSMS, $F(2,317) = 17.71$, $p < .001$. The pattern of results did not change when we controlled for gender.

Although generalized object attachment shares some similar behavioral indices with romantic SM, we argue that those phenomena stem from different motivational factors. The results indicated that although generalized object attachment was positively correlated with RSMS, $r(320) = .13$; $p < .01$, in line with previous studies (Keefer et al. 2012) it was predicted by a different pattern of attachment orientations; specifically, it was positively predicted by both insecure attachment orientations, anxiety ($\beta = .09$; $p = .10$), and avoidance ($\beta = .15$; $p < .01$), $F(2,317) = 4.78$; $p < .01$.

Did the RSMS and generalized attachment to objects differ in predicting the relationship closeness to one's partner and keeping an object associated with one's partner nearby? Two separate regression analyses revealed that in line with our hypotheses, only the RSMS ($\beta = .54$; $p < .001$) and not generalized attachment to objects ($\beta = .05$; $p > .05$) significantly increased the chance that participants would have an object related to their partners close to hand, $R^2 = .30$, $F(2,317) = 66.77$; $p < .001$. A similar pattern was observed for perceived closeness to one's partner (RSMS: $\beta = .37$; $p < .001$ and overall attachment to objects: $\beta = −.02$; $p > .05$, $R^2 = .13$, $F(2,317) = 24.00$; $p < .001$).

In sum, this study provides further evidence that romantic SM is associated not only with motivation to maintain a close romantic relationship but also to achieving a sense of closeness to one's partner. In contrast, generalized attachment to inanimate objects was related to insecure attachment orientations. However, romantic SM and generalized attachment to inanimate objects are related constructs, even though they are functionally distinct. Romantic SM may act as a substitute for a partner's presence and thus, at least temporarily, regulates

emotional distress (Niemyjska 2015). In contrast, overall object attachment facilitates a distancing of oneself from disappointing relationships (Keefer et al. 2012).

General Discussion

We hypothesized that some individuals value inanimate objects because they either resemble their partner (e.g., a photograph) or have been in contact with him/her (e.g., gifts) and that because of this, they behave as though these objects contain the essence of their loved one. Our research confirmed that there are in fact individual differences in romantic SM.

This research was designed to achieve three goals: (a) to develop a brief measure of romantic SM; (b) to examine cognitive and motivational antecedents of this tendency; and (c) to distinguish it from similar phenomena (i.e., paranormal beliefs, anthropomorphism, and generalized attachment to material objects). Below we discuss these three areas.

First, we demonstrated that directing attachment to inanimate objects can be measured reliably and validly using the RSMS in both Polish and American/British populations. To our knowledge, this is the first measure to cover the propensity for SM in the specific context of a romantic relationship. There are, however, some important aspects of the RSMS that warrant discussion. First, across the three studies the average scores on the RSMS ranged from 2.41 to 2.77, which is somewhere in the middle of a five-point Likert scale. Before concluding that romantic SM is not very common in close relationships, it is worth noting that because the RSMS is a self-report measure it is susceptible to self-presentation motives. According to prominent research in the field of magical thinking (Rozin et al. 2007; Subbotsky 2010), participants prompted to acknowledge their magical intuitions may experience discomfort and embarrassment and may—in some cases—repress their magical beliefs. Despite the fact that we did not ask about magical beliefs but instead examined behavioral indices of SM, the RSMS items describe situations that may be considered too irrational, intimate, or private to share. Therefore, we speculate that the level of romantic SM indicated by the RSMS may be somewhat underestimated. This concern could be addressed using experimental procedures

(which we are currently running in our laboratory) that would allow participants not only to declare their level of romantic SM on the scale but also to behave accordingly, for example when an attempt is made to break the magical bond between the object and the target person, e.g., shredding the partner's photograph.

We showed that the RSMS has a unidimensional structure both in Polish and US & UK samples, which suggests that in the context of a romantic relationship both the law of similarity and the law of contagion may serve a similar function and/ or may be equally available. In contrast, sensitivity to SM in other domains, for example in the perception of food, may be more selective (Nemeroff and Rozin 1992). In Nemeroff and Rozin's (1992) study, participants (Jews of varying levels of orthodoxy) manifested limited susceptibility to either contagion or similarity.

Second, the results confirmed our hypotheses concerning the cognitive and motivational antecedents of romantic SM. We showed that romantic SM may depend on two relatively independent factors: a cognitive vulnerability to accept magical intuitions manifested by increased experiential information processing (Study 1 and 2), and motivation to increase closeness in a romantic relationship indicated by both increased attachment anxiety and decreased attachment avoidance (Studies 1, 2, and 3). Regarding motivational factors, our results corroborate earlier findings (Niemyjska 2015; Niemyjska et al. 2011) showing that romantic SM is related to the increased perception of a partner's closeness. However, this research also extends previous work by showing that romantic SM has two relatively independent sources. Further research is needed to corroborate the causal relationships between cognitive and motivational factors, and the RSMS.

Third, we showed that the RSMS overlapped somewhat with paranormal beliefs, anthropomorphism of technological devices (Studies 1 and 2), and generalized attachment to material objects (Study 3), and yet was substantially different from them. We demonstrated that romantic SM may be much more than a mere judgment error; it may be a motivated process. In contrast to paranormal beliefs, anthropomorphism, and generalized attachment to inanimate objects, the RSMS was explained by a coherent pattern of increased attachment anxiety and decreased attachment avoidance which, we assume, reflect attempts to minimize distance from a romantic partner (Mikulincer et al. 2003). Correspondingly, the RSMS was uniquely associated with increased relationship closeness as indicated by both self-report (Studies 1 and 2) and pictorial measures (Study 3), and increased relationship satisfaction. In contrast, both paranormal beliefs and overall attachment to inanimate objects were irrelevant to relationship quality measures, and anthropomorphism was linked to decreased relationship closeness.

The three studies converged on the conclusion that romantic SM may be an important factor affecting close relationships. First, it may regulate perceived closeness in a romantic relationship and, in the long run, increase relationship satisfaction. Second, the RSMS was consistently associated with the necessity of having an object nearby related to one's partner (Studies 1−3), which suggests that people who score higher on RSMS may be eager to retain photographs and keepsakes of their loved ones. Additionally, in the UK & US sample the RSMS was linked to better recall of a Christmas gift received from one's partner, which confirms that people susceptible to SM may draw associations between material objects and their loved ones, possibly to imbue these objects with symbolic meaning.

Having a validated measure of romantic SM opens up new avenues for future studies. Above all, it appears important to use an experimental design to confirm the function of directing attachment behaviors toward inanimate objects associated with one's partner and to differentiate it from attachment to inanimate objects that do not have social associations. As we discussed earlier, romantic SM differs substantially from generalized attachment to inanimate objects. Most importantly, it enables an object to be perceived as a symbolic extension of a loved one (Belk and Coon 1993) and, thus, helps to maintain a sense of connection with him/her. Previous studies of non-human sources of support (e.g., Frost and Steketee 2011; Keefer et al. 2012; Nedelisky and Steele 2009) have not dealt with this specific class of tangible objects—things associated with a loved one. Consequently, previous results were often interpreted as though attachment to inanimate objects originated away from social relationships and offered an alternative source of comfort that "challenge[d] the uniqueness of human relationships in providing feelings of security" (Keefer 2016, p. 236). Our research suggests that directing attachment to inanimate objects associated with a loved one (i.e., romantic SM) may originate in social relationships, because it is related to both an increased need for closeness with a partner and greater obtained intimacy, closeness, and relationship satisfaction. Consequently, it might be practically important to acknowledge the coping potential of romantic SM. Since romantic SM facilitates a feeling of immediacy with another, it could be helpful in coping with dispositional attachment insecurity, prolonged separation, or even bereavement (Riches and Dawson 1998).

We hope that this research will stimulate more intense theorizing on healthy attachment to inanimate objects and facilitate more accurate and comprehensive assessments of a variety of its forms. Most importantly, our results raise the question of the positive effect that attachment to inanimate objects may have on social relationships. The existing data are somewhat inconclusive. Pieters (2013) found a bidirectional link between acquiring/owning material objects and loneliness, in which valuing material possessions as a measure of success and a cure for happiness was related to higher levels of loneliness over time; loneliness, in turn, was

related to increases in these subtypes of materialism. Notably, this latter effect was the stronger. In this vein, Keefer et al. (2012) claim that attachment to inanimate objects is an alternative source of security that compensates for the unreliability of close others. Yet, our studies suggest that this may not always be the case. Cherished possessions associated with close others, such as photographs, gifts, or romantic notes, may in fact foster perceived closeness in romantic relationships. Hence, for some people, it is not the object that is valued but the connection that it symbolizes (Frost and Steketee 2011).

Compliance with ethical standards

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