

Love

What Is It, Why Does It Matter, and How Does It Operate?

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ABSTRACT—*Love is a perennial topic of fascination for scholars and laypersons alike. Whereas psychological science was slow to develop active interest in love, the past few decades have seen considerable growth in research on the subject, to the point where a uniquely psychological perspective on love can be identified. This article describes some of the more central and well-established findings from psychologically informed research on love and its influence in adult human relationships. We discuss research on how love is defined, the significance of love for human activity and well-being, and evidence about the mechanisms by which love is believed to operate. We conclude by describing several key questions and potentially important new directions for the next wave of psychological science.*

If ever there was a topic that has fascinated scientists, philosophers, historians, poets, playwrights, novelists, songwriters, and lay persons alike, that topic is love. From cave paintings and ancient scripture to modern techniques for brain imaging and multilevel modeling, people have sought to use the tools of their time to better understand the nature and significance of love. That love should have such broad and enduring appeal testifies not only to its importance to the human condition, but also to its complexity as the subject matter under scrutiny. In this article, we describe how psychological scientists have made considerable progress in studying love in the past few decades, to the point where love may no longer be as mysterious or elusive as is commonly assumed.

The word *love* is often used loosely, which has likely impeded progress in research (Berscheid & Meyers, 1996). For example, in English, love can refer to one's evaluation of a film; a relation to one's country or a deity; a food preference; a person's orientation to another; or affects held about an activity, a parent, a

sibling, or a potential sexual partner. In this article, we define *love* as a desire to enter, maintain, or expand a close, connected, and ongoing relationship with another person or other entity, and we limit our discussion to this variety of love. By *entity*, we refer to specific targets (in addition to humans) such as pets, fictional characters, or even deities. We limit our focus here to love as it is experienced between adults in relationship contexts, excluding such examples as nonspecific compassionate love (e.g., love of humanity), love of inanimate objects (e.g., ice cream), and arelational lust (e.g., sexual arousal outside of relationship contexts).

More than with most psychological constructs, considerable energy has been devoted toward developing a taxonomy of love—for example, Rubin's (1970) early distinction between liking and loving; Sternberg's (1986) tripartite model of passion, intimacy, and commitment; and Lee's (1988) and Hendrick and Hendrick's (1986) systematic classification of various love constructs from literature and philosophy (e.g., *agape* or selfless love, *eros* or romantic love, *ludus* or gaming playing love). Taxonomies play a necessary and valuable role in the early stages of theory development and in the context of such a broad and inclusive construct. Most contemporary love researchers have built on this foundation by adopting a process-oriented approach in which the primary aim is to understand the regulatory mechanisms (cognitive, emotional, and behavioral processes, as well as their cultural contexts and neurohormonal underpinnings) that are intrinsic to different types of love and that are causally responsible for the diverse effects that have been observed in decades of research. It is the search for these regulatory mechanisms that makes the current approach to love vibrant and full of promise for further advancing knowledge.

A BRIEF AND NECESSARILY SELECTIVE HISTORY OF HOW LOVE RESEARCH GOT HERE

Many popular contemporary ideas can be traced to the classical Greek philosophers. Prominent in this regard is Plato's *Symposium*, a systematic and seminal analysis whose major ideas

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remain relevant (e.g., Aron & Aron, 1991) and which served as a key impetus for one major theoretical model of love (Aron & Aron, 1986) and one popular taxonomy (Lee, 1988). Indeed, *Symposium* has probably influenced contemporary work on love more than all subsequent philosophical work together. Notably, although opinions and treatises on love continued to be produced in a steady and occasionally conspicuous stream (see Hunt, 1959, for a review), most of these have played only indirect roles in shaping current psychological theory and research. On the other hand, four major intellectual developments of the 19th and 20th centuries provided key insights that helped shape the agenda for current research and theory. In each of these instances, the contribution came less from the actual content of their work and more from the broad conceptual framework that they, and others who followed in their tradition, had established.

The first of these was Charles Darwin, who proposed that reproductive success was the central process underlying the evolution of species. Evolutionary theorizing has led directly to such currently popular concepts as mate preference, sexual mating strategies, and attachment, as well as to the adoption of a comparative approach across species. A second figure was Sigmund Freud. Contemporary research and theory on love features many psychodynamic principles first introduced by Freud, such as the importance of early childhood experiences, the powerful impact of motives operating outside of awareness, the role of defenses in shaping the behavioral expression of motives, and the role of sexuality as a force in human behavior. A third historically significant figure was Margaret Mead (and the 20th century field of cultural anthropology that she personifies). Mead's vivid descriptions of cultural variations in the expression of love and sexuality led researchers to consider the influence of socialization and to recognize cultural variation in many aspects of love (Hatfield & Rapson, 1996). A final influential figure was Kurt Lewin. Lewin himself did little research directly relevant to love, but he famously championed and modeled the possibility of studying seemingly inaccessible social processes in the laboratory, a still thriving approach adopted widely and influentially by social psychologists beginning in the 1970s—for example, in Byrne's (1971) studies on the causal impact of attitude similarity on attraction, Berscheid's and Walster's (1978) experiments on the determinants of attraction, Altman and Taylor's (1973) studies of self-disclosure, and Dutton and Aron's (1974) studies of the arousal-attraction link. The emerging women's movement during the 1970s also contributed to a cultural climate that made the study of what had been traditionally thought of as "women's concerns" not only acceptable, but in fact necessary for the science of human behavior.

At roughly the same time that this latter group of social psychologists were beginning their work to show that adult love could be studied experimentally and in the laboratory, two developmentally oriented psychologists, Harry Harlow and John Bowlby, were coming into prominence. Working independently, but with admiration of and support for each other's efforts,

Harlow and Bowlby established that maternal love and caregiving could be observed, conceptualized, and investigated with the same rigorous standards as other behavioral phenomena. Their work set the stage for modern biologically based approaches because of their desire to utilize systematic comparative and evolutionary approaches to derive regulatory mechanisms that would readily apply to humans. A notable successor here is Hazan and Shaver's (1987) conceptualization of adult romantic love as an attachment process, an approach that has spawned literally hundreds of studies. Further, Harlow's and Bowlby's work, achieving prominence in the same general period as the work of experimental social psychologists and also more humanistic approaches (e.g., Maslow, 1962), opened the door to the scientific study of a fundamental question that until that point has been considered outside the range of science: How were these (and other) evidently disparate, yet seemingly associated, manifestations of a single word (i.e., love) categorically related to one another?

Any history of psychological research on love would be incomplete without reference to "l'affaire Proxmire," as Hatfield (2006) put it. In March 1975, William Proxmire, then a powerful U.S. Senator, gave the first of a series of so-called Golden Fleece awards to Ellen Berscheid and Elaine Hatfield (then Elaine Walster), the two most prominent love researchers of the time who had recently received a federal grant for their work, for what he saw as the misuse of federal tax-payer dollars on a topic "better left to poets." For the ensuing years, that ill-informed and ignoble proclamation cast a pall not only on Berscheid and Hatfield, but on any scientist interested in studying love (Benson, 2006). To this day, politics occasionally obstructs funding for and the conduct and dissemination of research on love (e.g., congressional challenges to peer-reviewed research in 2005). Fortunately, and perhaps not coincidentally, the political barrier to love research in the U.S. has been more an impediment than a terminus (other countries, particularly Canada, have taken a more enlightened view, as have at least two private foundations, the Fetzer and Templeton Institutes). As we describe in the remainder of this article, the scientific study of love is alive, well, and thriving (even in the U.S.).

WHAT'S PSYCHOLOGY GOT TO DO WITH IT?

How have these traditions come together to contribute to a uniquely psychological perspective on love? How has psychology provided inroads into understanding love that would not have been possible in other scholarly or scientific contexts? We examine this question by summarizing what we consider to be established knowledge based on solid empirical research, organized with reference to the three questions stated in the title of this article. We examine these questions separately, but it will be evident that these research themes are not independent of one another. In each case, the conclusions we highlight represent a uniquely psychological approach to these questions that have

attracted, as mentioned earlier, and continue to attract attention over the centuries from diverse perspectives and disciplines.

What is Love?

Considerable evidence supports a basic distinction, first offered by Berscheid and Walster in 1978, between *passionate love* (“a state of intense longing for union with another,” p. 9) and other types of romantic love, notably what they labeled *companionate love* (“the affection we feel for those with whom our lives are deeply entwined,” p. 9). The evidence for this distinction comes from a variety of research methods, including psychometric techniques (e.g., factor analysis, multidimensional scaling, and prototype analysis), examinations of the behavioral and relationship consequences of different forms of romantic love, and biological studies (discussed later in this article). Most work has focused on identifying and measuring passionate love; other aspects of romantic love seem actually to include two components: intimacy and commitment (e.g., Sternberg, 1986). Some scholars see companionate love as a combination of intimacy and commitment, whereas others see intimacy as the central component (e.g., Reis & Patrick, 1996), with commitment as a peripheral factor (but important in its own right, such as for predicting relationship longevity; Rusbult, Olsen, Davis, & Hannon, 2001).

Perhaps in response to the inconclusiveness of theoretical and philosophical attempts to define love, some researchers have adopted a bottom-up approach by examining how ordinary people construe love and their many different love experiences. Studies grounded in prototype models (Mervis & Rosch, 1981) have been particularly influential. The pioneer in this area, Fehr (1988), asked one group of participants to list words they considered to be features of love then asked a separate sample to rate each of the more common nominations for its centrality to the concept of love. (Neither group was given more specific instructions about the word *love*.) Results from this and other studies suggest strongly that lay understandings of love have a prototype structure. That is, rather than having a formal definition with necessary and sufficient conditions, concepts of love may represent a set of graded categorizations, with some characteristics being more central than others. Thus, in Fehr’s study, trust and caring were considered highly prototypical of love, whereas uncertainty and butterflies in the stomach were more peripheral. The prototype analysis suggests that when ordinary people think about different types of love, they are not treating them as examples or nonexamples with sharp defining boundaries, as classical theories sometimes assume; rather, each type resembles the other to the degree that each possesses qualities central to the prototype.

The prototype approach has stimulated several valuable lines of research. One concerns information processing, showing that central features of the prototype are often assumed in various ways even if absent (for example, by false memories or as a substitute for related characteristics). Another seeks to deter-

mine whether the particular prototype to emerge from research conducted with North American students would also appear in other age groups and cultures. (Results have been generally similar with some interesting variations; Fehr, 2001; Hatfield & Rapson, 1996.) A third line of research involves the identification of the underlying latent dimensions of the prototypical features (Aron & Westbay, 1996), which appear to be intimacy, commitment, and passion—an interesting convergence with scientific approaches to identifying aspects of romantic love as noted above. A further implication of the prototype approach seeks to provide a framework for thinking about the many varied states and experiences that people often describe with the word *love* (e.g., love of God, love of country, love of the New York Mets, puppy love, and love of puppies). These may be understood as sharing certain features of the prototype to at least some extent (Fehr & Russell, 1991).

Why Love Matters

The recent infusion of an evolutionary perspective into the study of close relationships (e.g., Buss & Kenrick, 1998; Hazan & Diamond, 2000) has brought with it a newfound respect for the importance of love in human behavior. Whereas this research was once thought to be epiphenomenal, trivial, or unworthy, recent theorizing points squarely to the role of love as part of a suite of evolved regulatory mechanisms designed to solve specific interpersonal problems with adaptational significance. To be sure, direct evidence supporting this interpretation remains to be garnered. Nevertheless, such theorizing creates linkages with the comparative literature that, until recently, were largely ignored by scholars who study human relationships. Because behavioral manifestations of love (in both its passionate and companionate forms) are evident in many different species, it should be clear that the functional significance of love predates the emergence of *homo sapiens* (J. Diamond, 1997; Fisher, 1998). Of course, the uniquely human abilities for language, introspection, and other forms of higher cognition suggest that human love is considerably more complex than is seen in non-human animal models.

Passionate and companionate love solve different adaptational problems. Passionate love may be said to solve the attraction problem—that is, for individuals to enter into a potentially long-term mating relationship, they must identify and select suitable candidates, attract the other’s interest, engage in relationship-building behavior, and then go about reorganizing existing activities and relationships so as to include the other. All of this is effortful, time-consuming, and disruptive. Consequently, passionate love is associated with many changes in cognition, emotion, and behavior (Aron, Fisher, & Strong, 2006). For the most part, these changes are consistent with the idea of disrupting existing activities, routines, and social networks to orient the individual’s attention and goal-directed behavior toward a specific new partner (Berscheid & Ammazalorso, 2001). This interpretation fits well with evi-

dence that passionate love typically (though not invariably) decreases in the early years of marriage, even in satisfied couples (see Aron et al., 2006, for further discussion).

Sexual desire is often and substantially linked to passionate love, although existing evidence suggests that they are empirically and functionally distinguishable. For example, Fisher (1998) argues that romantic attraction and sexuality involve different brain systems, a contention supported *de novo* by recent functional magnetic resonance imaging studies (e.g., Aron et al., 2005). Of course it is quite common that people experience sexual desire for someone for whom they do not feel passionate love. More interestingly, L.M. Diamond (2003) has noted that people sometimes feel passionate about persons toward whom they feel no sexual attraction, which she exemplifies by noting that sexual orientation (defined in terms of sexual preferences) does not necessarily predict the object of passionate love. Just how passionate love should be distinguished from, yet certainly associated with, sexual desire remains an important question for future research.

Considerably less activity has been devoted toward understanding the evolutionary significance of the intimacy and commitment aspects of love. However, much evidence indicates that love in long-term relationships is associated with intimacy, trust, caring, and attachment, all factors that contribute to the maintenance of relationships over time. From an evolutionary perspective, it is especially crucial that love between parents, and of parents for children, continues long enough to raise children. In this light, Gonzaga, Keltner, Londahl, and Smith (2001) argue that love of this kind may solve the so-called commitment problem, keeping partners connected with each other over time and thereby accruing advantages in evolutionarily significant tasks: rearing offspring to maturity, warding off sexual rivals, and maintaining one's standing within a social group (see also J. Diamond, 1997). More generally, the term *companionate love* may be characterized by a strong version of what Clark and Mills (1993) refer to as a *communal relationship*: a relationship built on mutual expectations that oneself and a partner will be responsive to each other's needs.

It is interesting to speculate that companionate love, or at least the various processes associated with it, is responsible for the oft-noted association between social relatedness and health and well-being (see Reis, Collins, & Berscheid, 2000, for a review). At least three general mechanisms have been implicated by empirical studies: support of health-related behaviors by relationship partners, mediation by positive and negative affect, and direct effects by biological processes that regulate social relations. In a recent series of papers, DePaulo and Morris (e.g., 2006) challenge the oft-voiced claim that marriage is linked to health benefits (e.g., Kiecolt-Glaser & Newton, 2001). One part of their argument suggests that relatedness per se is more nearly responsible, a need that may or may not be fulfilled within marriage. The idea that relatedness may be associated with health and well-being has received broad support in several

literatures, including research on loneliness (Cacioppo & Hawkley, 2005), social network involvement (House, Landis, & Umberson, 1988), social inclusion and exclusion (MacDonald & Leary, 2005), and lifespan development (Hartup & Stevens, 1997). Reis (2007) even goes so far as to suggest that there may be a common theme underlying all of these, which he labeled "perceived partner responsiveness" to the self, or the tendency to feel that others are understanding, supportive, and caring of the self. Although companionate love is rarely studied outside of the context of romantic relationships, its very definition as the affection we feel for those with whom our lives are deeply entwined suggests that it may well play a role in these effects. Of course, to the extent that companionate love is equivalent to intimacy, a connection that we anticipate will likely be established, there is a considerable literature whose findings are directly relevant (Reis & Patrick, 1996).

Having noted the positive functions of love, it is also important to consider the dark side. That is, problems in love and love relationships are a significant source of suicides, homicides, and both major and minor emotional disorders, such as anxiety and depression (e.g., Fisher, 1992). In the context of passionate love, unrequited love (which is problematic to both the lover and beloved) may well be more common than requited love; in ongoing love relationships, rejection, violence, abandonment, jealousy, and loss are significant and common. Then there is grief, which would not exist without love. Passionate love is commonly associated with large swings in positive and negative moods, though the extent to which these fluctuations are conceptually interdependent has not received attention. Love matters not only because it can make our lives better, but also because it is a major source of misery and pain that can make life worse (Berscheid & Reis, 1998). Finally, even love that is requited and generally positive typically includes some negative affect (Aron et al., 2006).

How Love Operates

Mechanisms by which circumstances influence love and in turn by which love influences behavior have been studied at both psychological and physiological levels, although these are not yet well-integrated (see below). One major question is whether passionate love operates in the manner of an emotion or a motive, and there is evidence to support both models. For example, passionate love has many of the experiential qualities of strong emotions, is typically aroused by the presence of an environmental stimulus (i.e., the other) with important implications for personal well-being, and seems to reorient attention and other action-preparing resource systems in much the manner that emotions do. On the other hand, passionate love appears to have a less unique and differentiated experiential signature than most emotions do, is not associated with particular facial expressions, is especially difficult to up-regulate, is linked to strong goal-directed strivings, and is associated distinguishably with activation primarily in reward-related brain regions as opposed to in

emotion-related areas (Aron & Aron, 1991; Aron et al., 2005). Of course, it is plausible that, in the end, passionate love will turn out to involve elements from both systems.

Passionate love is linked with arousal and novelty. For example, self-expansion theory argues, with considerable empirical support, that the exhilaration and intense arousal characteristic of passionate love arises from the rapid growth of self experienced in new love relationships (Aron, Paris, & Aron, 1995), or what Baumeister and Bratslavsky (1999) described as incremental expansions in intimacy. Similarly, theories grounded in concepts such as excitation-transfer and misattribution propose that feelings of passionate love are heightened by arousal that is attributed or misattributed to the target of one's affections. Both models are consistent with the idea mentioned earlier that passionate love exists to redeploy energies and attention to potential mating partners. For example, passionate love is frequently linked to difficulties concentrating on other activities, intense desires for closeness and contact, and idealized perceptions of the loved person.

Companionate love is more closely linked with intimacy and bonding. Although the literature contains relatively few studies explicitly investigating causal antecedents of companionate love, its close connection (if not isomorphism) with intimacy, caring, and trust suggests certain key principles. For example, intimacy, caring, and trust have been shown to result from interactions in which partners are perceived to be responsive to each other's needs and fulfill attachment-related functions, such as providing a secure base and a safe haven when distress occurs, and are perceived as understanding and valuing of the self (e.g., Murray, Holmes, & Collins, 2006; Reis, Clark, & Holmes, 2004; Shaver & Mikulincer, in press). The motivational significance of companionate love is more nearly involved in relationship maintenance—as such, its significance is more evident in long-term relationships.

There is also relevant nonhuman animal research (Fisher, 1998). Birds and mammals appear to have evolved several distinct brain systems for courtship, mating, and parenting, including (a) sex drive, characterized by a craving for sexual gratification; (b) attraction, characterized by focused attention on a preferred mating partner; and (c) attachment, characterized by the maintenance of proximity, affiliative gestures, and expressions of calm when in social contact with a mating partner and of separation anxiety when apart. Each neural system is associated with a different constellation of brain circuits, different behavior patterns, and different emotional and motivational states. With regard to human love, many scholars believe that one can equate attraction with passionate love and can equate attachment with companionate love.

These are just a few examples of findings regarding love. Recent reviews (e.g., Aron et al., 2006) show that we know a great deal about all kinds of love—such as what predicts who will fall in love with whom; the typical trajectories of love over time; the mechanisms that account for variations in those tra-

jectories; and how experiences and behaviors of love vary across individual differences, cultures, and species. As with other phenomena once thought to be the exclusive domain of poets and philosophers, psychological science has made love substantially less mysterious.

Where the Next Wave of Psychological Research on Love May Be Headed

Predicting the future of a large, vibrant, and perhaps unruly research area such as love is a bit like trying to predict on New Year's Eve which stocks will be the coming year's big winners: If it was that obvious, someone would have bought them already. Nevertheless, the past half-century's worth of research on love has amply demonstrated that research on love is a cumulative enterprise, steadily building a comprehensive understanding out of a foundation of theory, bricks of empirical evidence, and the mortar of conviction that any complete science of human behavior must incorporate this all-important facet of the human experience. With this in mind, we offer the following prognostications, expectations, and hopes for the next wave of research.

One particularly timely prediction is that psychological theories of love are likely to become more biologically informed, in the sense that the psychological and behavioral phenomena associated with love will have clear, comprehensible, and distinguishable neural and hormonal substrates (as well as identifiable parallels in other species). We posit that this will be useful not so much for the intrinsic purpose of identifying the brain and body regions in which love occurs, but rather because the identification of neural and hormonal circuits corresponding to particular experiences and behaviors will allow researchers to sort the various phenomena associated with love into their natural categories. In other words, phenomena that engage common neural architecture should be linked conceptually and functionally, whereas phenomena that engage distinct neural systems should be more differentiated. Our review suggests several important questions awaiting such analysis. For example, it will be important to further distinguish passionate love from companionate love on the one hand and from lust (i.e., sexual feelings) on the other. This distinction will be important for a key reason: Although current evidence strongly suggests that these three forms of love involve different biological systems, different functions, different behaviors, and different consequences, much thinking in both popular culture and the scientific literature conflates them. It will also be valuable to examine how neural activations of passionate and companionate love evolve in a given relationship over time, corresponding to experiential changes.

In a related vein, it will also be important to identify biological mechanisms that contribute to the experiential and behavioral expressions of love. For example, several components of empathy are relevant to love, including affective sharing and perspective-taking. Recent research identifies neural regions associated with these and with related social cognitions

(in particular, the insula, anterior cingulate cortex, and right temporo-parietal region; e.g., Decety & Jackson, 2006). These findings are interpreted as evidence for neural systems dedicated to affective sharing and affective communication. Because love (among other markers of relationship strength) is known to moderate the impact of these variables, it follows that activity within these brain systems must be influenced in some manner by love. Similar logic applies to other cognitive operations, such as memory and reasoning, which some theorists have proposed evolved to deal with relational contingencies (Cosmides & Tooby, 2005). Even relatively low-level brain systems, such as those involved in perception, action planning, and motor control have been hypothesized to have evolved because of the need to interact with others (Knoblich & Sebanz, 2006). In short, it seems likely to us that the next wave of research will articulate important connections between love and many, if not most, basic human information processing systems.

We also believe that research will address how culture shapes the experience and expression of love. Although both passionate and companionate love appear to be universal, it is apparent that their manifestations may be moderated by culture-specific norms and rules. For example, passionate and companionate love have profoundly different implications for marriage around the world, considered essential in some cultures but contraindicated or rendered largely irrelevant in others (Coontz, 2005). Further, even within cultures there are significant changes over historical periods. For example, among U.S. college students in the 1960s, only 24% of women and 65% of men considered love to be the basis of marriage, but in the 1980s this view was endorsed by more than 80% of both women and men (Simpson, Campbell, & Berscheid, 1986). One of us (Harry T. Reis) has replicated Simpson et al.'s research annually in classes for the past two decades, consistently finding similar, sometimes even higher, percentages. Psychological research has barely begun to examine the local or historical circumstances that may have given rise to such differences or the conceptual dimensions that may be germane (e.g., individualism–collectivism, analytic–holistic reasoning; but see Levine, Sato, Hashimoto, & Verma, 1995, for an exception). More research is also needed to better understand how these cultural differences affect the various cognitive, emotional, and social behaviors that are created by love.

It will also be important, we believe, to examine love and its underlying processes outside of romantic relationships, currently the context for an overwhelming majority of the field's research. It is clear, however, that companionate love applies in other types of relationships (e.g., between siblings and between close friends), and for that matter, there is good reason to believe that passionate love also applies outside of romance, for example to close friends and family members, although perhaps not as intensely. If nothing else, such studies should help the field better distinguish love itself from mating, courtship, and marriage.

Finally, we also believe that the future will see a better understanding of what may be the quintessential question about love: How this very individualistic feeling is shaped by experiences in interaction with particular others. A large majority of existing research focuses on the individual who loves another person; relatively little research examines the determinants of feeling loved by others in ongoing relationships (although conceptual linkages to such concepts as attachment models are readily available) or on the act of giving love to others. To be sure, it is very likely that feeling loved involves both actual experiences and dispositional readiness (e.g., rejection sensitivity). It is clear, however, that love involves particular experiences between particular individuals—my love for you and your love for me, feelings not experienced with other persons—and not just general tendencies to be favorably disposed toward others. Just how these processes unfold in emerging relationships, how they are instantiated in the context of changing social networks and situational constraints and opportunities, and how they wax and wane over time and circumstances in long-term relationships, represent key questions for future research.

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