The Similarity Trilogy

1) Genetic

Contraceptive pill users make different mate choices, on average, compared to non-users.

Papers:
* “Human oestrus” Gangestad & Thornhill (2008)
  "Only short-term but not long-term partner preferences tend to vary with the menstrual cycle"

* "Does the contraceptive pill alter mate choice in humans?” Alvergne & Lummaa (2009)
  ". whereas normally cycling women express a preference for MHC (Major Histocompatibility Complex) dissimilarity in mates, pill users prefer odours of MHC-SIMILAR men, indicating that pill use might eliminate adaptive preferences for genetic dissimilarity."

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2) Recommender Systems

Recommender systems (a.k.a recommendation engines) can be based on:
- past actions (as the formerly Beacon at Facebook)
- a pattern of personal preferences (by collaborative filtering, as the actual one at Facebook) The main disadvantage with recommendation engines based on collaborative filtering is when users instead of providing their personal preference try to guess the global preference and they introduce bias in the recommendation algorithm.
- personality traits of users.

Personality Based Recommender Systems are the next generation of recommender systems because they perform FAR better than Behavioural ones (past actions and pattern of personal preferences)
That is the only way to improve recommender systems, to include the personality traits of their users.
Have you seen they need to calculate personality similarity between users?
Have you seen there are different formulas to calculate similarity?
In case you did not notice, recommender systems are morphing to .......... compatibility matching engines!!
They mostly use the Big5 to assess personality and the Pearson correlation coefficient to calculate similarity.
Researchers in the Personality Based Recommender Systems arena are also testing different / novel formulas to calculate similarity, useless at all because they use the Big5 to assess personality of users.

That is nothing new, nothing innovative. Online Dating Sites like eHarmony/eDarling, Parship, Be2, MeeticAffinity and others had been calculating personality similarity between prospective users since several years ago with low successful rates, with a low effectiveness/efficiency level of their matching algorithms (less than 10%) because they use the normative Big5 or ipsative proprietary models instead -like Chemistry or PerfectMatch- to measure personality traits.
You can see:
Papers.
* "Using Personality Information in Collaborative Filtering for New Users"
* "Design and User Issues in Personality-based Recommender Systems"
* "Emotive and Personality Parameters in Multimedia Recommender Systems"
* "Personality based user similarity measure for a collaborative recommender system"
* "The LDOS-PerAff-1 Corpus of Face Video Clips with Affective and Personality Metadata"
* "Addressing the New User Problem with a Personality Based User Similarity Measure"
* "Improving the believability in the interaction of synthetic virtual agents: Towards Personality in Group Dynamics"

Book
* "Recommender Systems based on Personality Traits: Could human psychological aspects influence the computer decision-making process?"

summary of recommender systems in my blog

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3) Theories of Romantic Relationships Development

Latest Research in Theories of Romantic Relationships Development clearly shows: compatibility is all about a high level on personality* similarity* between prospective mates for long term mating with commitment.
*personality measured with a normative test.
*similarity; there are different ways to calculate similarity, it depends on how mathematically is defined.

PAPERS
#1 Charania & Ickes (2009) “Personality influences on marital satisfaction: Integrating the empirical evidence using the Actor-Partner Interdependence Model (APIM) model” 
"... substantial level of inter-partner personality similarity for seven of the thirteen personality traits studied, with four of the similarity correlations exceeding 0.38 ..."

#2 Rammstedt & Schupp (2008) "Only the congruent survive - Personality similarities in couples. Personality and Individual Differences"
".... Results reveal that among the Big Five dimensions, there are strong differences in spouses’ congruences. While for Extraversion and Emotional Stability, congruence is close to zero, correlations averaging at 0.30 are found for Agreeableness, Conscientiousness, and Openness."

#3 Barelds & Dijkstra (2008) "Do People Know What They Want: A Similar or Complementary Partner?"
"In The Netherlands, where this study was conducted, almost 40% of the divorcees report mismatches in personalities as the major cause of their break-up (De Graaf, 2006; Amato and Previti, 2003). .... although several studies have revealed similarities between partners in their personalities (e.g., Buss, 1984; McCrae, Martin, Hrebicková, Urbánek, Boomsma et al., 2008) only few studies have investigated the extent to which similarity in personality leads to romantic attraction (Barelds and Dijkstra, 2007). From
their finding that couples across age groups show the same partner similarities (McCrae et al. 2008) conclude that mate selection, rather than convergence over time, accounts for personality similarity among partners." Finally, the present study explored a recent issue uncovered by Eastwick and Finkel 2008; also Kurzban and Weeden, 2007; Todd, Penke, Fasolo, and Lenton, 2007 who found that people often report partner preferences that are not compatible with their choices in real life.

#4 McCrae, Martin, Hrebícková, Urbánek, Boomsma et al. (2008) “Personality Trait Similarity Between Spouses in Four Cultures”
"... Most assortment effects were small, but correlations exceeding 0.40 were seen for a subset of traits, chiefly from the Openness and Agreeableness domains. ... This suggested that mate selection, rather than convergence over time, accounted for similarity"

#5 Barelds & Dijkstra (2007) "Love at first sight or friends first? Ties among partner personality trait similarity, relationship onset, relationship quality, and love"
"... partner personality trait similarity was related to relationship quality as a function of both relationship onset and specific personality traits."


"... Individuals sought mates that were matches of themselves to some degree (a concept that we termed aspirational positive assortative mating) but also sought mates that were somewhat higher in Conscientiousness, Extraversion, Agreeableness, and Mate Value, but lower in Neuroticism than themselves."

#8 Bekkers, van Aken & Denissen (2006) "Social Structure and Personality Assortment Among Married Couples"
"... Personality characteristics like agreeableness and neuroticism are good predictors of marital conflicts and ultimately of union dissolution, even across different relationships (Robins, Caspi & Moffitt, 2002). ... In sum: spouses with higher levels of neuroticism and openness, spouses with lower levels of agreeableness, and couples with more dissimilar personalities at the time of marriage are more likely to divorce."

#9 Gaunt (2006) "Couple similarity and marital satisfaction: Are similar spouses happier?"

#10 Amodio & Showers (2005) "Similarity breeds liking revisited: The moderating role of commitment"
While opposites attract for short term affairs, similarity is preferred for marriage.

#11 What is important in attracting people to one another may not be important in making couples happy, as stated in the Klohnen & Luo 2005 paper "ASSORTATIVE MATING AND MARITAL QUALITY IN NEWLYWEDS: A COUPLE CENTERED APPROACH", February 2005
".......People may be attracted to those who have similar attitudes, values, and beliefs and even marry them (at least in part) on the basis of this similarity. However, once individuals are in a committed relationship, IT MAY BE PRIMARILY PERSONALITY SIMILARITY THAT INFLUENCES MARITAL HAPPINESS. ...."
Although none of the above papers use the 16PF normative personality test (they mostly use different versions of the normative Big5 personality test instead) and linear or logistic multivariate regression equations to calculate similarity, they clearly show a connection between personality similarity and marital happiness / dyadic success (stability and satisfaction) for some persons.

Researchers / Academics are hypnotized by the Big 5 test, but the Big 5 test to assess personality of mates / spouses is an oversimplification. One extravert (a bold, fearless, high-energy type) may differ considerably from another (a sweet, warm, sensitive type), depending on the extraversion-related primary scale score patterns.

I had been suggesting since years to use the 16PF5 (or 15FQ+) normative test, the complete inventory, 16 factors/variables, as established by Dr. Raymond Cattell in 1949, and discard the Big 5 test forever.

WorldWide, there are 5,000 -over five thousand- online dating sites but no one is using the 16PF5 to assess personality of its members! but no one calculates similarity with a quantized pattern comparison method! but no one can show Compatibility Distribution Curves to each and every of its members! but no one is scientifically proven!

Actual online dating sites offering compatibility matching methods are only fueled by big marketing budgets and not by serious scientific evidence. No one (eHarmony/eDarling, Chemistry, PerfectMatch, PlentyOfFish Marriage Predictor, Meetic Affinity, Be2, RewardingLove, Parship, True, etc) can prove its matching algorithm can match prospective partners who will have more stable and satisfying relationships than couples matched by chance, astrological destiny, personal preferences, searching on one's own, or other technique as the control group in a peer-reviewed Scientific Paper. They are all like placebo, because
* Actual online dating sites offering compatibility matching methods, when calculating compatibility between prospective mates, have less or at least the same precision as searching on one's own. [in the range of 3 or 4 persons compatible per 1,000 persons screened]
* That is because they use:
  a) simplified versions of personality traits, instead of the 16PF5 or similar with the complete inventory (16 variables)
  b) inadequate quantitative methods to calculate compatibility between prospective mates, like eHarmony which uses Dyadic Adjustment Scale or other sites which use multivariate linear / logistic regression equations o other equations.

To solve that problem I propose:
*) the 16PF5 or similar normative personality test to measure personality of normal persons over 26 years old interested in serious dating.
No actual online dating site offering compatibility matching methods uses the 16PF5 normative test available in different languages.

*) a new quantitative method to calculate compatibility between prospective mates, based on quantized pattern comparison (part of pattern recognition by correlation) named LIFEPROJECT method.
The value of my algorithm is to achieve far more precision than searching on one's own [in the range of 3 persons compatible per 100,000 persons screened, 100 times better than actual competitors] and try to prove if only high level on personality* similarity* between mates is the core of relationship stability and satisfaction for normal persons over 26 years old interested in serious dating.

*personality: measured with the 16PF5 normative test in different languages.
*similarity: calculated using the method I had invented, LIFEPROJECT method.

The 16PF5 normative personality test codifies personality with 16 variables taking integer values from 1 to 10 in stens (standardized tens).

(A) Warmth; (B) Reasoning; (C) Emotional Stability; (E) Dominance, (F) Liveliness; (G) RuleConsciousness; (H) Social Boldness; (I) Sensitivity; (L) Vigilance; (M) Abstractedness; (N) Privateness (O) Apprehension; (Q1) Openness to Change; (Q2) SelfReliance; (Q3) Perfectionism; (Q4) Tension.

The ensemble (whole set of different valid possibilities) of the 16PF5 is: 10E16, big number as All World Population is nearly 6.7 * 10E9

Dyadic comparison, SIMILARITY, between person #X and person #Y is given from the following formula, derived / adapted from an advanced math equation

<#X| means client #X's 16PF5 Report
|#Y> means client #Y's 16PF5 Report
|CQ| means Comparison Operator

\[
<\text{M}_x|\text{C}_q|\text{M}_y> \quad \text{means the Comparison, SIMILARITY, between client } \#X \text{ and client } \#Y \\
<\#X|CQ|\#Y> \text{ means } \sum_{\text{variable}} K\text{variable} \cdot \text{value}_{\text{variable}} = \text{SIMILARITY (PROBABILITY OF BEING COMPATIBLE)}
\]

With K01 + K02 + K03 + K04 + K05 + K06 + K07 + K08 + K09 + K10 + K11 + K12 + K13 + K14 + K15 + K16 == 1 or 100% 
K01 <= K02 <= K03 <= K04 <= K05 <= K06 <= K07 <= K08 <= K09 <= K10 <= K11 <= K12 <= K13 <= K14 <= K15 <= K16 means not necessarily all the same 

and
The 16PF5 result is a quantized pattern, like
John's
Lucy's

How to calculate similarity between quantized patterns using LIFEPROJECT method.

Eg:
16 distinguishable particles in a one_dimensional box of length L and infinite outside the box with 10 quantized levels of energy (named box John) distinguishable particle (A) Warmth at level "6"
distinguishable particle (B) Reasoning at level "7"
distinguishable particle (C) Emotional Stability at level "6"
distinguishable particle (E) Dominance at level "8"

(all real values of the complete base were derived by Fernando Ardenghi)
distinguishable particle (F) Liveliness at level "9"
distinguishable particle (G) RuleConsciousness at level "6"
distinguishable particle (H) Social Boldness at level "7"
distinguishable particle (I) Sensitivity at level "7"
distinguishable particle (L) Vigilance at level "8"
distinguishable particle (M) Abstractedness at level "7"
distinguishable particle (N) Privateness at level "2"
distinguishable particle (O) Apprehension to Change at level "5"
distinguishable particle (Q1) Openness at level "8"
distinguishable particle (Q2) SelfReliance at level "7"
distinguishable particle (Q3) Perfectionism at level "3"
distinguishable particle (Q4) Tension at level "4"

And

16 distinguishable particles in other one-dimensional box of length L and infinite outside the box with 10 quantized levels of energy (named box Lucy)
distinguishable particle (A) Warmth at level "5"
distinguishable particle (B) Reasoning at level "7"
distinguishable particle (C) Emotional Stability at level "4"
distinguishable particle (E) Dominance at level "8"
distinguishable particle (F) Liveliness at level "7"
distinguishable particle (G) RuleConsciousness at level "4"
distinguishable particle (H) Social Boldness at level "5"
distinguishable particle (I) Sensitivity at level "6"
distinguishable particle (L) Vigilance at level "4"
distinguishable particle (M) Abstractedness at level "6"
distinguishable particle (N) Privateness at level "8"
distinguishable particle (O) Apprehension to Change at level "9"
distinguishable particle (Q1) Openness at level "6"
distinguishable particle (Q2) SelfReliance at level "8"
distinguishable particle (Q3) Perfectionism at level "4"
distinguishable particle (Q4) Tension at level "4"

Each quantized level is associated with a probability density function.

<John |CQ| Lucy> is the sum of the comparisons between different states, the sum of partial probabilities.
<John |CQ Lucy> == 74.79865772%
Read as John's pattern is 74.79865772% +/- 0.00000001% similar to Lucy's
More at:
http://en.wikipedia.org/wiki/Particle_in_a_box
http://en.wikipedia.org/wiki/Matrix_%28mathematics%29

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