Fitting Theory with Methods in Fit Research

Cheri Ostroff
University of Maryland

My first foray into PE was more than 20 years ago for my dissertation research. At the time, I found the methodological issues to hurt my wee brain cells. Sadly, my brain still hurts, and it seems that taking aspirin and doing a fit study go hand in hand. I persist because PE fit is a fundamental principle for understanding behavior and attitudes of individuals in organizational settings. The research is exciting and meaningful.

There are several reasons why I think methodological issues in PE fit research are not easy. First, unlike most other constructs we deal with in our research, fit is typically assessed with two variables (person and environment) which are then combined to create a single variable. Second, fit is inherently a multi-level construct as it pertains to characteristics of the individual and characteristics of the environment. Third, there are fundamentally different types of fit questions which result in different methodological concerns.

Types of Fit Questions

There is no single best methodology or procedure for studying fit. I believe that the choice of methods and analytical techniques should be driven by answers to four questions about how fit is conceptualized.

Q1: Fit "to" and "at" which level of analysis (Ostroff & Schulte, 2007). Fit "to" a level refers to the organizational level of analysis for the E component of PE fit. For example, individuals' characteristics can be compared to the supervisor (person-supervisor fit), the job (person-job fit), the group (person-group fit) or the organization (person-organization). This choice will influence how E is to be measured. Fit "at" a level pertains to the level of analysis at which the study overall is conducted, such as the individual, group or organizational level. For example, we could link PE fit to individuals' performance in an individual-level study or to group effectiveness outcomes in a study conducted at group level of analysis. This choice will influence the type of analytical procedures that are appropriate.

Q2: Supplementary or Complementary as the process. In supplementary fit hypotheses, the "person fits into some environmental context because he or she supplements, embellishes, or possesses some characteristics which are similar to other individuals in this environment" whereas in complementary fit hypotheses, the "characteristics of the individual serve to 'make whole' or complement the characteristics of an environment" (Muchinsky & Monahan, 1987). For supplementary questions, techniques which allow for assessing similarity between P and E are needed. For complementary questions, techniques which allow for assessing configurations or profiles are needed.

Q3: How is E defined. E can be viewed as: a) a situational characteristic of the context, such as job requirements, structure, reward systems, culture; b) collective personal characteristics of members of the group or organization (e.g., collective personality, collective personal values of members); or c) a system of aligned elements that complement one another (e.g., alignment of HR practices or alignment of different but complementary skills in a team). This

choice will influence whether aggregation is needed as well as the appropriate analytical techniques.

Q4: Direct or Indirect as the theoretical basis. When fit is measured subjectively and directly as a perception of "how much do I fit my job [supervisor, group, organization]?" fit is reduced to a cognitive or affective response to the work environment and reflects idiosyncratic weighting of the various P and E factors. While this type of fit question is warranted if you are interested in examining individuals' own feelings of fit, I believe it veers from the way PE fit was originally conceived. It doesn't allow us to examine the relative impact the P and E factors and their combination. Regardless, when an overall subjective view of fit of interest, then fit is represented by a single variable and can be used in analyses just like any other variable.

Alternatively when fit is conceived of as a pairing of two distinct factors, P and E, then fit is indirect. P and E factors are measured separately but need to be combined in some way to represent fit. To make matters more complicated, there are different ways that P and E can be assessed. First, both the P and E factors can be assessed from same individuals (i.e., asking individuals to report their own characteristics and to report on the work environment). Here, the assumption is that an individual's *own* perception of environment is what drives responses. However, response bias will likely be increased if both P and E are assessed at same time on same survey. Second, P and E can be assessed independently, from different entities. For example, P can be measured from individuals and E can be measured objectively or from a different set of individuals. The idea here is that E is a "reality" or feature that is separate from any individual's own cognitions and perceptions. In such cases, an objective measure of E does not always exist, hence E is often based on asking organizational members' perceptions and then aggregating these perception to represent the E variable (see Chan, 1998; Kozlowski & Klien, 2000; Bliese, 2000 for more on aggregation).

If we combine indirect assessments of fit (P and E measured separately) with the different ways in which E can be defined (Q3 above) and with the level of analysis (Q1), we have an explosion of types of fit questions, each with different methodological issues. To illustrate:

- Person-Person Fit at the Individual Level: Fit between an individual's own characteristics and the personal characteristics of others is related to individual outcomes
  - P is an individual's personal attribute (e.g., values)
  - E is a collective personal characteristic (e.g., aggregated *personal* values of group members)

- Person-Situation (job, group, organization) Fit at the Individual Level: Fit between an individuals own characteristics and the characteristics of the work situation are related to individual outcomes
  - P is an individual's personal attribute (e.g., values)
  - E is situational characteristic (e.g., organizational values)
  - E is measured objectively or E is measured as aggregated perceptions of others (e.g., aggregated *perceptions* of organization values)

- Person-Situation Fit at the Group Level: Fit between the collective characteristics of the group and the characteristics of the situation are related to group outcomes
  - P is aggregated (e.g., aggregated individual's personal goals)

- E is aggregated (e.g., aggregated perceptions of goals of the group)

And that's just a few of combinations. Time to take an aspirin.

General Methodological Issues

There is some debate about whether P and E dimensions *must* be commensurate (commensurate dimensions are similar in nature and definition). Examples of commensurate dimensions are: individual personal value for teamwork (P) and org value teamwork (E), or individual mathematical skill (P) and mathematical requirement of job (E). The use of commensurate dimensions ensures that the P and E factors are conceptually relevant to one another and differentiates fit from simple interaction.

In addition, there must be variance on both P and E. In a single unit, if P is obtained from individuals and E is based on individuals' own perceptions of E, variance may be restricted. This is because of the ASA process (Schneider, 1987) and because the environment is similar for all individuals. It is better to collect data across different units or organizations to ensure sufficient variance. If P is from individuals and E is objective or aggregated, then you *must* collect data across different units or organizations to get variance on E. That is, when the E factor is objective or aggregated, a single score for the unit or organization is obtained. What that means is that E will be constant in all analyses, and comparing to a constant E means that all we really test is P.

Analytical Techniques

Supplementary Fit Hypotheses. If you are interested in supplementary fit and the P and E factors are assessed separately, the two factors must be statistically combined in some way to create an index of fit. Difference scores are problematic because they collapse P and E together so their relative impact is unknown, tend to have low reliability, and absolute values can mask the direction of the difference (Edwards, 1993).

If the hypothesis of interest is in predicting fit (i.e. fit is the dependent variable) then multivariate regression (Edwards, 1995) is the most appropriate technique. In this procedure, P and E are retained separately and considered jointly as dependent variables. It allows for estimating the effects of each predictor variable on each component measure (P and E separately) as well as for estimating the multivariate association between the predictors and component measures as a set (P and E together). Further, the source of discrepancies (e.g., P>E, P<E, P=E) can be determined.

If your hypothesis of interest is that fit is related to some outcome, profile comparison (Chatman, 1987) or polynomial regression with response surface methodology (Edwards, 1993, 1994) are the most appropriate techniques.

Profile Comparison techniques essentially involve a correlation between P and E. Suppose you were interested in studying fit between an individual's values and the espoused cultural values of the organization. You derive a set of scores across multiple values for individuals and a set of scores for the same values from the perspective of the organization. The two sets of scores are then correlated for each individual and the correlation represents the degree of overall fit with a higher correlation indicating greater fit.

There are several limitations of profile comparison techniques. There are some statistical problems such as potential unreliability (see Edwards, 1994 for details). It only provides an overall index of the degree to which the individual fits across all dimensions, and doesn't allow for determining if some dimensions are more important than others. Also, "line of fit" and direction of misfit cannot be determined. In other words, all you have is some overall index of fit across all of the different dimensions (or values in this case). It is impossible to determine things like:

- Is fit at high levels equivalent to fit at low levels values, for example is fit when P values are high and E values are high related to the same outcome as fit when P values are low and E values are low?

- Does it matter if P>E or if E>P?

Many of these limitations can be overcome by using polynomial regression and response surface methodology techniques (Edwards, 1993, 1994). The premise of such techniques is that P and E measures represent distinct constructs and they need to be retained separately in analyses *and* considered jointly. P, E and outcomes are plotted in 3-dimensional space and tests are conducted to examine the form of fit. For example, this technique allows you determine if outcomes are the same when P>E as when P<E. While rigorous, there are limitations. A polynomial regression for *each* dimension must be conducted and it is less useful for determining how an individual fits across various items, dimensions or factors. It also requires larger sample sizes and can be more difficult to use and interpret.

In sum, profile comparisons can be useful if the interest is in capturing overall fit across multiple dimensions but it does not allow for nuanced examinations of how fit operates. Polynomial regressions techniques are more rigorous and allow for examining the functional form of fit (e.g., what happens if P>E or E>P) but are more micro in focus on each dimension or aspect of fit separately.

Complementary Fit. Here we are talking about the case when fit is conceptualized as alignment among people or contextual variables. Basically, it's the meshing of different attributes that work together in complementary ways so that the pieces fit together to form a coherent whole, such as the meshing of different peoples' skills in a team. To date, there has been relatively little theoretical and methodological development for such questions. From a conceptual standpoint, fit would involve conceptualizing which attributes of interest create fit. What is needed to create a whole whereby the pieces complement one another effectively? For a given set of attributes, what pattern or configuration will represent fit? From a methodological standpoint, cluster analysis can be useful because it captures the particular profile or pattern across attributes. For example, for a set of P variables (e.g., abilities, personalities, goals), individuals who have a similar patterns across these attributes are grouped together into a cluster. For a set of E variables (e.g., task interdependence, group norms), groups that have similar patterns across these attributes are grouped together into a cluster.

Summary

- Theory First! Define the type of fit question of interest

- Aggregation may be necessary for some E variables
  - When E is defined as the collective characteristics of people in that environment
  - When E is defined as a social-psychological construct such as culture or climate

- For P-E fit (e.g., person-person; person-situation)
  - profile comparison analysis yields an overall index of degree of fit across all dimensions
  - polynomial regression yields precise form of fit for each dimension

- For complementary fit questions
  - Cluster analysis yields patterns

- Phew!

References

Bliese, P.D. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In K.J. Klein & S.W.J. Kozlowski (eds.), *Multi-level Theory, Research and Methods in Organizations*. San Francisco: Jossey-Bass.

Chan, D. (1998). Functional relations among constructs in the same content domain at different levels of analysis: A typology of composition models. *Journal of Applied Psychology, 83,* 234-246.

Chatman, J. (1989). Improving interactional organizational research: A model of person-organization fit. *Academy of Management Review, 14,* 333-349.
Edwards, J.R. (1994). The study of congruence in organizational behavior research: Critique and proposed alternative. *Organizational Behavior and Human Decision Processes, 58,* 51-100.

Edwards, J.R. (1995). Alternatives to difference scores as dependent variables in the study of congruence in organizational research. *Organizational Behavior and Human Decision Processes, 64,* 307-324.

Edwards, J.R., & Parry, M.E. (1993). On the use of polynomial regression equations as an alternative to difference scores in organizational research. *Academy of Management Journal, 36, 1577-1613*

Harrison, D.A. (2007). Pitching Fits in Applied Psychological Research: Making Fit Methods Fit Theory. In C. Ostroff & T. A. Judge (Eds.) Perspectives on Organizational Fit. Erlbaum.

Kozlowski, S.W.J. & Klein, K.J. (2000). A multilevel approach to theory and research in organizations: Contextual, temporal and emergent processes. In K.J. Klein & S.W.J. Kozlowski (Eds.), *Multilevel theory, research and methods in organizations (pp. 3-90).* San Francisco: Jossey-Bass.

Muchinsky, P.M. & Monahan, C.J. (1987). What is person-environment congruence? Supplementary versus complementary models of fit. *Journal of Vocational Behavior, 31,* 268-277.

Ostroff, C. & Schulte, M. (2007). Multiple perspectives of fit across levels of analysis. In C. Ostroff & T. A. Judge (Eds.) Perspectives on Organizational Fit. Erlbaum.

Ostroff, C., et al. (2007). Methodological issues in fit research. In C. Ostroff & T. A. Judge (Eds.) Perspectives on Organizational Fit. Erlbaum.

Schneider, B. (1987b). Environment=f(P,B): The road to a radical approach to the person-environment fit. *Journal of Vocational Behavior, 31,* 353-361.