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A Brief Review of Biodata History, Research, and Applications

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The assertion is often made that individuals are the sum total of their behavior and experience. This notion, along with the widely held belief that the best predictor of future behavior is past behavior, is at the core of the keen interest in biographical life history information. Information on life history can be obtained in many ways, including narrative biographies, interviews, cumulative observational records, and biographical data questionnaires. The latter, referred to as biodata, have been a preferred method for gathering life history information in applied psychology for over one hundred years. A number of studies, have documented biodata-type research programs that have led to the development and operational usage in practical settings. In military settings, studies conducted by the Army, Navy, and the Air Force have documented successes (and failures) of these efforts in the prediction of first term attrition. A comprehensive review and efforts aimed at laying out a program of assessing military service adaptability via biographical inventories is presented in Trent and Laurence. A collection of biodata items that can be used as a starting point for the construction of the biographical component of an adaptability screen is presented in the Appendix of this report. It is proposed that these items be utilized in the initial data collection and keying efforts.

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Foreword

The assertion is often made that individuals are the sum total of their behavior and experience (Allport, 1937). This notion, along with the widely held belief that the best predictor of future behavior is past behavior, is at the core of the keen interest in biographical life history information. Information on life history can be obtained in many ways, including narrative biographies, interviews, cumulative observational records, and biographical data questionnaires. The latter, referred to as biodata, have been a preferred method for gathering life history information in applied psychology for over one hundred years (Stokes, 1994).

A number of studies (Stokes, Mumford, & Owens, 1994), have documented biodata-type research programs that have led to the development and operational usage in practical settings. In military settings, studies conducted by the Army (Erwin, 1984), Navy (Atwater & Abrahams, 1983), and the Air Force (Guinn, Johnson, & Kantor, 1975) have documented successes (and failures) of these efforts in the prediction of first term attrition. A comprehensive review and efforts aimed at laying out a program of assessing military service adaptability via biographical inventories is presented in Trent and Laurence (1993). A collection of biodata items that can be used as a starting point for the construction of the biographical component of an adaptability screen is presented in the Appendix of this report. It is proposed that these items be utilized in the initial data collection and keying efforts.

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A Brief Review of Biodata History, Research, and Applications

The assertion is often made that individuals are the sum total of their behavior and experience (Allport, 1937). This notion, along with the widely held belief that the best predictor of future behavior is past behavior, is at the core of the keen interest in biographical life history information. Information on life history can be obtained in many ways, including narrative biographies, interviews, cumulative observational records, and biographical data questionnaires. The latter, referred to as biodata, have been a preferred method for gathering life history information in applied psychology for over one hundred years (Stokes, 1994).

Historical Overview

The first known use of the method was the "job application blank" that was introduced in 1894 at a meeting of the Chicago Underwriters. It was proposed that a series of standard questions assessing key elements of an individual's life experience could be used to improve selection of life insurance agents. Examples of the types of questions that were suggested included marital status, present and past addresses, individual financial status, and previous work experience (Owens, 1976).

From the early part of the twentieth century (Goldsmith, 1922; Russell & Cope, 1925) until World War II, a number of publications dealt with the empirical analyses of biodata item responses for sales and other occupations. These focused on discrepancies between responses of good and poor performers and subsequent weighting of item responses for generating predictor scores (Stokes, 1994). During World War II many studies (cited in Owens, 1976) conducted by and for the military reported impressive validities of keyed multiple-choice items for predicting a number of organizationally relevant criteria. Among these were success in training, post-training performance ratings, and attrition. In one study (cited in Owens, 1976), scored biodata were found to be more predictive of ROTC leadership ratings for officers and cadets, than any combination of ten tests of aptitude, attitude, or physical ability. The scored biodata form enjoyed increasing popularity during the post-war years in both the military and civilian sectors (Cowles & Dailey, 1949; Hadley, 1944; Johnson, 1944; Keating, Paterson, & Stone, 1950; Levine & Zachert, 1951; Lockman, 1954; Mock, 1947; Mosel & Cozan, 1952; National Research Council, 1946).

One of biodata's strengths has been its ability to predict future performance. Until the 1960s, the primary focus was on the construction of items and item sets for maximizing criteria prediction. Numerous articles and reports described methods of keying responses to particular sets of questions used in conjunction with selection systems. By 1935, Long and Sandiford (1935) were able to cite over 20 different methods for empirically keying item responses. Capitalizing on this strength was the popular weighted application blank (England, 1971). Though a great deal of work in practice and

research dealt with biodata's virtues as a predictor, little if any progress was made in the area of theory development. Whether it was explicitly stated or not, the implication was that it didn't really matter why biodata worked, the important thing was that it did.

Another current of thought was running through the post-World War II psychological community, however, that realized the importance of developing a theoretical footing for future biodata research and use. Perhaps due to the relaxed mood that existed in the United States, as a result of the enviable world position that was occupied, during the immediate post-war period; more time was made available for scientific inquiry that was not directed toward national crisis. This was also a period of time that proved to be a major crossroads for psychology as a whole. Psychologists had proven their worth during World War II, as they had during the World War I, but due to numerous fissures that had developed between those practicing psychology and those teaching psychology the field as a whole was trying to "refind itself." The most outwardly noticeable sign of this was the reorganization of the American Psychological Association, for the purpose of remaining "the organization" representing the psychologists in this country.

During this period another closely related area to biodata was seeing large gains in the area of theory development. Influenced by the state of learning theory at the time, and using factor analytic methods, many of the building blocks that characterize our current conception of the field of personality were laid (Pervin, 1990). In addition, the "cognitive revolution" marked the beginnings of what could be characterized as the waking of a sleeping giant. Amidst this backdrop, it was no wonder that those who had admired biodata's more utilitarian qualities in practice were moving in the direction of a conceptual foundation for measures of life history.

Paving the way were a number of theoretical works extolling the necessity of using scored life history questionnaires (Owens & Henry, 1966). In his now classic treatise on "the two disciplines of scientific psychology," Cronbach (1957) proposed the schism between experimental and correlational psychology could be mended via the use of biodata and other psychometric information. According to Cronbach (1957), there was a need for historic information in the entire field of measurement for increasing understanding and permitting enlightened inferences of causation (Owens & Henry, 1966). Tyler (1959) stressed a need for studying human choice behavior in conceptualizing individuality. She pointed out the efficacy of biographical information for inferring patterns of differential choice behavior across the life span; thereby increasing individual predictability and understanding. Addressing the issue of improving the prediction of criteria, others (Dunnette, 1963; Ghiselli, 1956), were optimistic about the potential benefits of sub-grouping analysis based on information obtained from biodata.

With the stage set, a number of key events in the development of biodata occurred during the 1960s. Spearheaded by the direction of William A. Owens and associates, major strides were made in the area of categorizing and cataloging scored multiple-choice life history items (Glennon, Albright, & Owens, 1966). The exhaustive list included items tapping areas such as school and work, personal relationships, health, and attitudes, among others. In addition, Owens and Henry (1966), provided one of the earliest overviews of scored autobiographical measures, which included a review of

previous efforts up to that point, recommendations on item construction, psychometric properties, and then-current and potential uses. The climax of this period, however, was a conference (Henry, 1966) that brought together the leading individuals in the field for the purpose of defining the past, present, and future of biodata as a discipline of inquiry. The conference served to bridge the gap existing between the practical and the burgeoning theoretical foundations, and provided the impetus for development of modern biodata research.

The decades that followed have proven to be very fruitful ones in terms of establishing an understanding of the nature of biodata and providing guidelines for its usage. Wernimont and Campbell (1968) proposed a "consistency model" that took the emphasis in employee selection away from an almost total reliance on tests as predictors. Their model's essence was "the establishment of consistencies between relevant dimensions of job-behavior and pre-employment samples obtained from real or simulated situations." The new procedure placed a considerable emphasis on the use of background data (Wernimont & Campbell, 1968). Concurrently, Owens (1968), using Cronbach's (1957) theoretical "one discipline" frame as a point of departure, presented his developmental-integrative model for the first time. This model, which was originally proposed as a way of aiding in the integration of the experimental and correlational (or individual difference-based) disciplines of scientific psychology, established a framework for using biographical information to "discover" subgroups of individuals displaying differential development. Knowledge of these different patterns would then be used to understand and predict future behavior. Other work (Owens, 1971, 1976; Owens & Schoenfeldt, 1979) served to solidify the potential benefits of the model. On a more practical level, Asher (1972) provided some guidelines for defining what biodata should and should not be, and Thayer (1977) described the evolution of a then 55-year old biodata instrument that had been used successfully in the life insurance industry.

What is Biodata?

Before proceeding with further discussion, it is important to define biodata and the attributes of items that fall under this rubric. As Henry (1966) stated, this task has been difficult due to the large amount of controversy surrounding it. As Nickels (1994) has pointed out, many researchers (Asher, 1972; Mumford & Owens, 1987) have attempted to establish guidelines for defining exactly what is and what is not biodata, however, the universal acceptance of these efforts has not been accepted.

Mael (1991) provides the most recent attempt to pull together the current streams of research trying to establish a common framework for biodata research. Mael's synthesis of the current state of knowledge on what constitutes biodata item attributes was presented in tabular form (Mael, 1991, p. 773). The characterization that is presented draws on the work of others (Asher, 1972), but includes revisions to reflect the state of current research and sensitivity to legal and social concerns. Mael defined ten attributes or dimensions that fall into three broad categories: *historical, methodological,* and *legal/moral.* Mael mentions that an additional category of attributes that has received attention in the past (Owens, 1976), concerns response scale alternatives. Mael also points out that though this particular area is of great importance, the key points apply to all self-report measurement, and are therefore out of the scope of his discussion.

The *historical* category encompasses that dimension of biodata that many would see as the defining characteristic that separates biodata from other domains (Gunter, Furnham, & Drakeley, 1993; Mael, 1991; Nickels, 1994). Biodata has not been consistently defined with this aspect in mind, especially in earlier times when there was a tendency among many researchers to label any personal information (e.g., personality) as autobiographical self-report data (Owens, 1976). By limiting biodata to events that have taken place or continue to take place, while excluding items about hypothetical behavioral intentions, the possibility of a respondent fictionalizing himself is speculated to be reduced (Asher, 1972).

The issue of controlling for fallacious self-presentation is, however, more directly addressed via dimensions that fall under the second category (*methodological*) of item attributes (Mael, 1991). In fact, Mael orders these dimensions in such a way that they form a rough continuum with each attribute setting a higher standard for ensuring self-report accuracy. *Externality* refers to the extent to which behaviors in a particular item could have been witnessed by outside observers. Mael provided the example of a question soliciting information on whether respondents had been fired from a job as one that would have a high degree of this attribute. An item dealing with individuals' attitudes toward marijuana smoking would not, however, be externally observable (Mael, 1991). A closely related attribute pertains to the *objectivity* of the events described in the item (Nickels, 1994). Whereas asking the number of hours spent preparing for a dissertation would be quite objective, asking about the respondent's feelings during that time would not. Furthermore, a high degree of *first-handedness* (Nickels, 1994) would reduce the possibility of response distortion. Here, inquiring about an individual's typical attendance at work, rather than what significant others (e.g., supervisors or co-workers) would say about the respondent's work attendance, would minimize speculation that goes into providing a response.

The fourth attribute in this category, according to Mael (1991), deals with the *discreteness* of the item information. This refers to a single, unique event or a simple count of unique events, as opposed to summary (e.g., average number of hours spent engaging in a particular event). Mael posited this attribute may be desirable because it only requires memory retrieval, whereas, summary estimations require a greater degree of cognitive tasking, which increases the likelihood of inaccuracy. However, Mael did not negate the potential usefulness of summary measures, particularly with regard to prediction of "typical" performance.

Finally, the *verifiability*, or extent to which a respondent's answers can be substantiated by outside sources is an important dimension. Mael (1991) pointed out that like all of the aforementioned attributes, the amount of consensus regarding the importance of verifiability as a criterion to be met for biodata is low. Some researchers (Asher, 1972; Guion, 1965) place a great deal of importance on this attribute, while others (England, 1971; Mumford & Stokes, 1992) take a more relaxed stance. Mael stated the requirement for item information verifiability might be better defined as "verifiable in principle." Here he notes the actual verification of a large number of items might be costly and impractical, which would cut into the benefits of biodata use. The value added might actually lie in the respondent's perception that his answers could be "checked for accuracy" rather than whether or not they were actually subjected to this test.

The final four attributes of biodata items (Mael, 1991) are those that pertain to *legal* and *moral* issues. As the category label implies, it is these characteristics of biodata items that will be most effected by the contemporary legal and social climate, and those that open biodata up to the most public scrutiny (Farmer & Witt, 1998). It is here that biodata's survival as an applied instrument for employee selection lies.

The first of these, *controllability* refers to the extent to which the information obtained in a particular item is a function of the respondent's direct control. As Mael (1991) reminds us, this attribute is directly related to the conceptual foundation for delineating between *input variable* and *prior behaviors* item types (Owens & Schoenfeldt, 1979). Controllability as a characteristic of biodata is an area that is subject, as many others, to being at the mercy of a double-edged sword. From a theoretical perspective (Mael, 1991; Mumford & Stokes, 1992; Owens & Schoenfeldt, 1979) the amount of individual control over past events should not be at issue. The things that "one does" will not necessarily affect or shape later behavior any more than the things that "are done to one." Whereas, an individual's choice to participate in a particular activity is essentially a function of a decision that is consciously made, the fact that the individual's parents participated in the same activity may be exerting "indirect" control on the ultimate behavior. Further, each or both of these aspects can serve as future behavior shapers. Though demographic variables (i.e., socioeconomic status, race, gender) are often times frowned upon (Mumford & Stokes, 1992) as biodata items, they too can serve to shape subsequent behavior and would merit consideration in any theoretical discussion on the effect of past events on future behavior. Even a cursory perusal of the content of many biodata instruments used in practice (England, 1971; Glennon, Albright, & Owens, 1966; Mael, 1991) will yield a substantial number of items that are definitely not under the direct control of the respondent.

Mael (1991) points out that when items not under direct control of the applicant are used in situations where important decisions are at stake (e.g., employment), arguments based on theoretical reasoning lose out to legal reality. It is well known that such variables as gender and race are definitely "off limits" when considering an individual for employment. Similarly, practitioners often advise that "any" variable dealing with demographic, parental, or childhood information be excluded from a functioning biodata instrument (Mael, 1991). Though perhaps quelling certain ethical concerns, it should be noted (Mael, 1991) that totally eliminating non-controllable variables can oftentimes lead to undesirable properties. Mael (1991) cites an example where non-controllable items were excluded from an assessment profile on leadership effectiveness. Due to the fact that a complete assessment of the relevant domains was made untenable, the researchers were forced to include behavioral intention-type items. Ultimately, the decision to limit the controllability factor of items boils down to the intended purpose of the instrument, with special attention given to potential legal concerns.

Highly related to the controllability attribute is that of *equal accessibility*. Quite simply, this refers to the extent to which the events or experiences are equally accessible to all respondents (Nickels, 1994). An example of an accessibility-related item would be to ask about home personal computer usage, when the implication is that those who are socio-economically challenged would have no access to computers. Strict adherence to an equal accessibility criterion for biodata item inclusion is neither universally accepted practice nor theoretically prudent (Mael, 1991). Differing philosophies of the goal of

biodata will ultimately determine the appropriateness of items that potentially discriminate based on accessibility. Legally speaking it may be "safer" to avoid such items, whereas, regarding theory development, past accessibility would be an important determinant of future behaviors (Mael, 1991). This issue is not entirely split on practical vs. theoretical lines, however, as some practitioners (Gandy, Dye, & MacLane, 1994) strongly advocate continued use of items that may present material that will not be accessible to all applicants. Mael (1991) concludes by stating that "...neither non-controllable items nor non-equally accessible items need be intrinsically unfair or unethical. Moreover, adopting these constraints would so limit the use of external and objective items under some conditions that one would be forced to fall back on more subjective and fakable ones" (Mael, 1991, p.781).

Another area of definition pertains to the *job relatedness* (Mael, 1991), or as Nickels (1994) puts it, the *situational relevance* of the content of a particular item. As mentioned earlier, from a theoretical perspective, any singular event, patterns of events, or unconscious variable that has occurred in an individual's past can serve as a determinant, or at the very least a moderator, of future behaviors. This, however, can lead to problems for both researchers and practitioners. Though the explanation of a relationship between an apparently unrelated predictor and a criterion may be limited by the capabilities of the researcher (Farmer & Witt, 1998), it is imperative that a rational link be established at some level.

From an applied perspective, this potential ambiguity is subject to legal and public scrutiny, via interpretation of the *Uniform Guidelines on Employee Selection Procedures* (EEOC, 1978). Pace and Schoenfeldt (1977) point out that although the usual interpretation of job relatedness equates with criterion-related validity, that knowledge of the fact that content validity evidence, as assessed via job analysis, has played a role in court decisions (e.g., *Watson v. Ft Worth Bank & Trust*) (Ledvinka & Scarpello, 1992), practitioners should be cognizant of rational considerations in predictor-criterion links. In light of potential ramifications, at least in the public sector, Gandy, Dye, and MacLane (1994) recommend that items show a face valid relationship with elements of the job and, more conservatively, demonstrate an item-by-item mapping of predictors to criterion components.

Mael (1991) commented that using a cautious strategy regarding job relatedness would limit items to the *sample* domain (Wernimont & Campbell, 1968). This would make it difficult to predict a criterion for an individual that had never actually engaged in the specified behavior. Though such a plan would ensure a high degree of face validity, the effects of faking come into play as items that are most obviously job relevant are also the most subject to intentional distortion (Mumford & Owens, 1987). Currently most biodata instruments include a range of items that fall into both *sign* (observable behavioral antecedent) and *sample* (observable behavior) categories (McDaniel, 1989; Wernimont & Campbell, 1968).

The final attribute in Mael's (1991) taxonomy is that of perceived *invasiveness*. This dimension deals with the extent to which the items in a biodata instrument infringe upon an individual's right to privacy. Again, there appears to be a trade-off between positive and negative, as item types that are perceived as the least invasive are those that are the most hypothetical and subjective. In an effort to establish some guidelines on

what exactly constitutes invasiveness in item content, Mael, Connerley, and Morath (1996) found that the four motives that generated the most concern were: a) fear of stigmatization, b) concern about having to recall traumatic events, c) intimacy, and d) religion. Fusilier and Hoyer (1980) found that the individual's perception of the amount of control over the uses of information after its disclosure was directly related to feelings of privacy invasion.

Mael (1991) concluded that although many authors have attempted to establish some framework for characterizing biodata (Asher, 1972), none of them have eradicated the confusion that exists among those that utilize biodata (Bliesener, 1996). Although not always the case, it would appear that the only "given" is that biodata items be historical in nature (Mael, 1991; Nickels, 1994). Though some of the attributes seem to focus on the fakability of items, and others are centered around addressing legal concerns, none has been universally accepted as a criterion for limiting what biodata items consist of.

Advantages of Biodata

As mentioned earlier, biodata effectiveness is predicated on the premise that the best way to determine what an individual will do in the future, given no other information, is to know what they have done in the past. This does not imply people will always act in ways that are familiar to them, after all Lewin (1936) recognized behavior is a function of the person *and* their environment. It does capitalize on the rather obvious fact that people are more likely to exhibit behavior that has been previously conditioned. This propensity to elicit particular responses in particular situations, focusing on *typical behavior*, makes biodata an excellent device for forecasting. Biodata shares this characteristic with pre-employment interviews, background checks, and work histories.

Biodata does have some characteristics, however, that offer advantages when compared to the other methods (Mumford & Stokes, 1992). Biodata, unlike the other methods mentioned previously, can be collected in a relatively short period of time and at considerably less cost. Items are presented in a standardized form via paper-and-pencil or computer-based questionnaire. This allows for a potentially large amount of data to be collected on a large number of people, rendering it a far more economical alternative to lengthier, one-on-one methods. Another advantage biodata has is that standardized formatting allows for responses to be quantified, enhancing interpretability (Mumford & Stokes, 1992). Two other advantages are tied to the objective format of the items. Item content and form, including the substantive "meat" of an item and the way this substance is presented, can be tailored in such a way as to allow the researcher or practitioner a clearly defined picture of developmental patterns and relationships. Content and form of the stem, along with the additional leverage offered by the prespecified response options, contribute to biodata's utility. Finally, due to the fact that in a given biodata questionnaire all subjects are presented the same items in the same way, the potential for interviewer bias is eliminated. A number of other advantages to biodata exist, and many of these are presented in Owens (1976, pp. 611-612) and Gunter, Furnham, and Drakeley (1993, pp. 39-44).

Relationship of Biodata to Other Domains

Biodata and Personality

Mumford and Stokes (1992) noted biodata items often appear to be variants of the type of questions found in self-report personality inventories. This observation is made all the more palatable when one considers that biodata items are often strong predictors of scores on personality scales (Rawls & Rawls, 1968). Owens (1976) mentioned the results of a study in which factorially derived biodata scales were correlated with a number of personality measures. In addition to impressive relationships between the biodata and personality scales, the multiple *R*'s that resulted (.50 to .60) when personality scales were regressed on biodata scales lended support for the notion that the two possess a high level of shared variance. In another vein, Mumford and Owens (1987) found that biodata factors resembling the "Big Five" factors of personality (Digman, 1990) emerged. More explicitly, others have categorized biodata, and other measures of life history, as the “method of choice” for evaluating personality in personnel selection (Nunnally, 1959), and assessment (Dailey, 1960).

The aforementioned leads one to assume biodata items are simply another format for measuring personality (Mumford, Snell, & Reiter-Palmon, 1994), or temperament (Buss & Plomin, 1975). This position would certainly be consistent with those (Allport, 1937) who include an individual's experience in their definition of personality. More recently, others (Ashworth, 1989) focused on the distinction between the two being somewhat arbitrary and artificial. If, however, the distinction is made between “hard,” verifiable and factual, and “soft,” private and unverifiable, biodata (Asher, 1972) a clear delineation exists. In a recent study, Shultz (1996) tested a number of confirmatory factor analytic models of multi-trait/multi-method matrices, and found personality and soft biodata items represented one factor, and hard biodata items represented a second. Though unverifiable biodata appear to draw from a common variance source as personality, hard biodata is distinct.

With this in mind, many researchers (Mael, 1991; Mumford & Owens, 1987; Owens, 1976) have tended toward defining biodata in the way in which Asher (1972) defined “hard” biodata, though this is in no way a universal characterization (Mael, 1991; Mael & Schwartz, 1991). When one considers the domains from a measurement perspective, the differences between biodata and personality become evident. Self-report personality items generally solicit information regarding an individual's predisposition or general behavioral tendency toward a particular situational state. The focus is the individual's disposition, and therefore is limited to personal identity. For example, a typical question that would assess extroversion (Costa & McCrae, 1985) would elicit an individual's extent of agreement with the statement "I really enjoy talking to people."

Biodata items on the other hand, focus on prior behavior and experiences occurring in specific situations (Mumford & Stokes, 1992). Thus, items measuring behaviors and characteristics of individuals other than the respondent might appear as biodata items (Mael, 1991). Also, whereas personality item responses are influenced only by dispositional factors, biodata items capture aspects of the environment that affect and are affected by the individual.

In addition to personal, they are tied to social factors as well (Mael, 1991). Hence, a biodata item that would appear to measure something akin to extroversion might be "How often do you get together with friends?" (Glennon, Albright, & Owens, 1966) with a set of responses indicating frequency in a given period of time.

Mumford et al. (1994) noted there are, in addition to the specificity and focus in the measures of each, two major points of departure for personality and biodata. The first area concerns the element of choice. Biodata measures capture behavioral patterns that are explicitly tied to the decisions individuals make when presented with a particular situational stimulus. Personality measures, on the other hand, are not tied to a particular decision or choice, but more to a preference. Second, biodata items often tap into content areas that are probably influenced more by individual knowledge or skills than by personality. In fact, biodata-type items are often used as a preferred vehicle for accessing job-relevant information (Hough, 1984) necessary to assess knowledge, skills, or abilities (Mumford et al. 1994).

Biodata, Interests, and Cognitive Abilities

Mumford and Stokes (1992) noted biodata items have demonstrated a certain amount of overlap with vocational interest inventories (Eberhardt & Muchinsky, 1984). By tapping into past occurrences of behavior, especially those that are directly a function of or are related to particular occupations, biodata measures capture key determinants of interests (Mumford & Stokes, 1992). Mumford and Stokes (1992) noted likely relationships with attitudes and values also would exist for biodata.

As Mumford and Stokes (1992) stated, the relationship between biodata and measures of cognitive abilities has received less attention than that for other areas. As they and others (Mitchell, 1994) have pointed out, there is a fundamental difference between cognitive abilities as they are typically defined/measured and the way in which they are captured with biodata. Generally, aptitude or ability measures are constructed in such a way as to elicit maximal performance in a somewhat artificial problem-solving situation. Advocates (Gottfredson, 1997; Schmidt & Hunter, 1998) of the use of cognitive ability measures emphasize the high validities that consistently result when using them as predictors of future performance. However, others (Mitchell, 1998) are quick to point out that biodata often yield as high if not higher validities as performance predictors than measures of ability. A recent meta-analysis (Bliesener, 1996), based on 116 studies with 165 independent validities, found an estimated validity of .22 for predicting performance after correcting for a number of analyzed artifacts. Biodata are particularly useful in the prediction of typical or “everyday” behavior (Mitchell, 1994). Though biodata do not provide information on the upper bounds for performance, Mumford and Stokes (1992) speculate that they may be tapping into the same variance that measures

of practical intelligence (Sternberg, 1985; Wagner & Sternberg, 1985) do. In fact, properly constructed biodata may be the best way to assess the types of intelligence that are actually better predictors of real world outcomes (Gordon, 1997), such as job and life success.

To the extent that common sense (Sternberg, Wagner, Williams, & Horvath, 1995), creativity (Chambers, 1964; Sternberg & Lubart, 1996), or cognitive style (Sternberg & Grigorenko, 1997) would be reflected in developmental events, biodata offer a potentially useful alternative to more traditional measures. From a research perspective, biodata presents the possibility for investigating the interplay between environmental factors and cognitive functioning (Schooler, 1984), and is particularly suited to longitudinal study (Owens, 1953; Owens, 1966).

Conceptual Framework

Mumford and Owens (1987) point out that the fact that biodata measures solicit information regarding specific behavioral responses to particular situations, leads one to the conclusion that whenever an item predicts performance it must represent a correlate or "sign" for later performance. Owens (1976) argued for the study of biodata based on a developmental framework, and pointed out that the key is to find an item or set of items that in some way appear to be connected to the criterion of interest, with the ultimate goal of establishing a developmental linkage. Specifically, the challenge involves locating a set of items that optimally predict a relevant outcome, while providing a meaningful underpinning for empirical relationships.

There are two approaches to establishing a pool of items. In the first, the items may reflect behavioral or developmental patterns that contribute to or appear to be related to differential outcomes, but are not actual representations of the target behaviors. Mumford and Owens (1987) refer to this as an "indirect" approach. Conversely, a "direct" approach involves establishing an itemset that reflects demonstration of the criterion behavior in question. Which approach is used will depend upon the purpose of the instrument. Items developed "indirectly" may be less subject to the effects of response misrepresentation, however, they may be difficult to justify in employment situations where demonstration of job relatedness is paramount. Whenever possible, a set of items generated by both approaches would probably be optimal. Following the process of establishing item content domains, the items must be weighted in such a way as to reflect the relative importance of each in accounting for differential patterns of development.

Mumford and others (Mumford & Owens, 1987; Mumford & Stokes, 1992) emphasized that the aforementioned general description of a biodata instrument is dependent on two assumptions. The first is that a biodata scale's ability to predict a particular criterion rests on the extent to which items are considered a comprehensive description of the antecedent causal behaviors and experiences. Another way of stating this would be whether or not item stems and response options capture the essence of all developmental determinants. Second, the establishment of a measurable relationship that the developmental pattern be defined quantitatively. This property also allows for the relative weighting of items as a function of their importance in the developmental

schema. Mumford and Owens (1987) stated these two principles account for the recognized importance of item development and scaling issues in relation to other topics in the biodata literature. In fact, prior to about the mid-1980s, the lion's share of the scientifically relevant literature in biodata, outside of validity studies, pertained to these issues (M.D. Mumford, personal communication, February 3, 1999).

Concerning the latter issue, a number of techniques have been used for scaling biodata items (Nickels, 1994). The methods have been used in other areas of questionnaire development where there is no single correct response, including opinionnaires, personality inventories, and attitude surveys (Hornick, James, & Jones, 1977). The methods can be broadly grouped into test-centered and person-centered. Methods that are test-centered include *empirical keying*, *factorially derived keying*, and *rationally derived keying*. Person-centered methodology focuses on identifying particular recognizable groups of individuals that share certain past experiences and have common profiles. The method is most commonly known as *subgrouping*, and its development is often attributed to Owens (Nickels, 1994).

Although any of these methods can be used, and each has its advantages and disadvantages (Goldberg, 1972; Gunter et al., 1993; Hase & Goldberg, 1967; Hein & Wesley, 1994; Hogan, 1994; Hornick et al., 1977; Hough & Paullin, 1994; Mitchell & Klimoski, 1982; Mumford & Owens, 1987; Mumford & Stokes, 1992; Nickels, 1994; Schoenfeldt & Mendoza, 1994), the strategy used most often has been some form of empirical keying. More specifically, this term denotes any number of different methods for weighting items or response options based on their ability to predict differential patterns in a predefined criterion (Mumford & Owens, 1987; Mumford & Stokes, 1992; Nickels, 1994). Empirically derived, or *externally developed* as Goldberg (1972) refers to them, are typically created by correlating responses on items with the target criterion and weighting responses depending on their predictive ability.

The predictive ability of empirical keys is well documented (Hogan, 1994). In fact, whenever the value of biodata is posited, it is to a large extent based on a century of research and practice resting on the foundation of empirical keys. However, in practice some (Mitchell, 1998; Mitchell, 1994; Mitchell & Klimoski, 1982) appear to view the strong statistical relationships of biodata with relevant outcomes as the bottom-line for evaluation, empirically derived measures are not without problems. In fact, an apparent reliance on these types of keyed instruments, in the absence of theoretical justification, has helped earn the label “dustbowl empiricism.”

In light of this, many (Dunnette, 1962; Henry, 1966; Korman, 1968; Mumford & Owens, 1987; Owens, 1976) voiced concerns regarding biodata’s place in psychological theory. Since empirically keyed instruments capitalize on a relationship with a specific criterion, their ability to generalize to many phenomena is at the mercy of the criterion of interest. A broadly defined criterion will lend itself more readily to a generalizable itemset than a narrowly defined one (Mumford & Owens, 1987; Thayer, 1977). From the perspective of the sample(s) used for item development, Schwab and Oliver (1974) pointed out due to the large number of items typically used in biodata validation studies, there is a tremendous propensity to capitalize on chance relationships that may exist. Finally, due to differential factors that may operate in one group of individuals as opposed to another, a strictly empirical approach could be prone to being effected by the

relationship of these factors with the criterion (Pace & Schoenfeldt, 1977; O'Leary, 1973; Mumford & Owens, 1987). Though this last point may be of concern from a theoretical perspective, it also presents a potentially problematic situation legally and ethically in situations where outcomes that impact people (e.g., employment) are tied to the results of a biodata-scoring key.

Therefore, rather than using blatant empirical methods as the method for keying a set of biodata items, the specification of a well-defined network of antecedent and criterion behaviors is preferred (Nickels, 1994). As Nickels (1994) points out, a number of studies demonstrated items developed with specific hypotheses regarding the relationship of predictors to criteria in mind were far more likely to produce significant relationships than those developed without this theoretical foundation. Mumford and Owens (1987) pointed out that item pools containing items tapping into behaviors other than those relevant to future performance, and those that fail to take into account between group developmental shifts, will mislead instead of enlighten. Russell (1994) provided an excellent "point-of-departure" for those seeking guidance to developing biodata that are both content- and criterion-valid. By providing examples from the personality, vocational choice, and leadership literatures he provides one avenue for a theoretically sound approach to biodata item generation. In a somewhat different fashion, Fine and Cronshaw (1994), and Gunter, Furnham, and Drakeley (1993) focused on the importance of job analyses methods for establishing critical domains to be measured via the biodata itemset.

A number of individuals (Dunnette, 1962; Henry, 1966; Owens, 1976) recommended theoretically sound procedures be used in biodata development, with some (Fine & Cronshaw, 1994; Mumford & Stokes, 1992; Russell, 1994) providing very explicit guidance on how this might be accomplished. Nickels (1994) pointed out disappointingly that relatively few published studies have actually appeared to have done so. In an early effort, Himmelstein and Blaskovics (1960), investigated a biodata instrument developed based on systematic analysis of what constituted effective combat performance, focusing on risk-taking tendencies. They found the scale correlated .37 and .41 (both $p \leq .01$) with peer rated leadership and combat effectiveness, respectively. More recently, Russell, Mattson, Devlin, and Atwater (1990), published a study in which they had developed biodata items from the retrospective life-history essays of first-year students at the U.S. Naval Academy. Scales, based on pre-specified criteria, were developed and found to be predictive (validation and cross-validation) of military performance, academic performance, and peer ratings of leadership. In a study cited by Nickels (1994), Schoenfeldt and Mendoza (1988) hypothesized a number of dimensions critical for management performance. Using structural equation modeling, they verified the existence of most of their constructs. Though the aforementioned studies could lead to the conclusion that theory-driven biodata construction is still the exception rather than the rule, the possibility exists that the practice is more widespread than apparent. As pointed out by some (Russell et al., 1990), researchers are notorious for failing to provide information on how itempools were developed.

In addition to the fact that the documentation of theory/construct-driven biodata use is sparse, there are also very few well-developed models of autobiographical data. In a sense, most if not all of the defining theories in psychology, especially those explaining developmental issues and individual differences could be used as starting points for

establishing an understanding of biodata. Similar to the way in which organizations are viewed as entities that derive their identity from the individuals that constitute such (Schneider, 1987a; Schneider, 1987b; Schneider & Schneider, 1994), individuals can be viewed as a sum total of their experiences (Allport, 1937). Combine this with the oft-stated principle that behavior in a discrete situation is a function of individual differences the person brings to the situation combined with environmental variables (e.g., constraints, opportunities, etc.); and that such can feedback interactionally to shape the person (Magnusson, 1990), therefore influencing future behaviors; and you have a basic model of how biodata operates as such a strong predictor. Though this explanation provides a simple elegance, the actual application of this conceptual approach to explaining biodata has been slow in coming.

In light of this, it is not surprising that at the present time there is only one comprehensive and well-defined model of biodata. In 1991, Mael attributed this model to Owens, Mumford and their associates (Mael, 1991); however, the foundation for this model was actually laid by Cronbach (1957) in his now famous call to fellow psychologists to integrate experimental and correlational perspectives in research and theory development. From this, along with the then currently popular and well established stream of research using between-group differences as the level of analysis (Cattell & Coulter, 1966; Cattell, Coulter, & Tsujioka, 1966; Cleary, 1966; Ghiselli, 1956, 1960a, 1960b; Toops, 1948), Owens (1968, 1971, 1976) modified Cronbach's (1957) model, into a developmental-integrative model. Actually formulated as a model for research rather than one of theoretical explanation, the model specifies the clustering, or *subgrouping*, of individuals based on profiles created via autobiographical information. After the creation of subgroups, any number of criteria where differential behavior would be expected can be related to subgroup membership. The key here is that relationships of particular predictors to criteria of interest do not form the basis of group membership. Instead, individuals are assigned to groups, or perhaps more accurately pre-existing groups are discovered, based totally on data provided via biodata (which is more often than not found in the predictor space).

As an aside, a number of research publications, including theses and dissertations (Mumford & Stokes, 1992; Owens, 1976), using homogeneous subgroups as the unit of investigation, found subgroup status was predictive of verbal abilities (Eberhard & Owens, 1975), drug use (Strimbu & Schoenfeldt, 1973), over- and underachievement, Rorschach responses, and vocational interests (Mumford & Stokes, 1992). In addition to ongoing research that supported the predictive ability of the technique from a longitudinal perspective (Davis, 1984; Mumford & Owens, 1984; Owens & Schoenfeldt, 1979), subgrouping also served as a basis for "maximal manpower utilization" (Owens & Jewell, 1969; Schoenfeldt, 1974; Brush & Owens, 1979; Morrison, 1977; Feild & Schoenfeldt, 1975), and served as an alternative to moderator group analysis (Feild, Lissitz, & Schoenfeldt, 1975; Tesser & Lissitz, 1973; Lissitz & Schoenfeldt, 1974; Novick, 1974; Schoenfeldt & Lissitz, 1974; Novick & Jackson, 1974; Owens, 1978).

With regard to development of the aforementioned theoretical framework, the fact that biodata-developed subgroups were so effective in predicting a number of behavioral outcomes was useful. In addition, it provided a methodological tool for understanding individual differences, and a means for matching people with demands of particular situations (i.e., "the right people in the right job"). Of more interest, however, was a

pattern evident from the results of several "key" longitudinal studies. In two parts of an extended study, Feild and Schoenfeldt (1975) and Davis (1984) focused on the transitions from adolescence to the collegiate years, and from college to early adulthood, respectively. Using a canonical discriminant function analysis, Feild and Schoenfeldt (1975) found adolescent experiences accounted for 33 percent of the variance in collegiate experiences. Similarly, Davis (1984), using the same type of analysis found the adolescent derived subgroups accounted for 17 percent of the variance in experiences likely to occur within ten years of graduating from college. Though the impact of the adolescent-defined subgroups diminished as a function of the amount of time between the life history events and subsequent analyses, the fact remained that subgroup membership served as a predictor of future behaviors.

As compelling as the aforementioned results were, a study by Mumford, Stokes, Owens, and Jackson (1990) provided an even more interesting pattern. They examined how those who had been assigned to subgroups (or "prototypes") via a biographical questionnaire assessing adolescent experiences administered upon entering college moved through subgroups formed with information obtained from a questionnaire administered just before exiting college (this survey assessed college experiences). Similarly they administered surveys assessing post-college experiences 2–4 years post-college and 6–8 years post-college. Again prototype subgroups were formed with this information. A series of chi-square analyses revealed individuals assigned to adolescent subgroups tended to enter 2 or 3 college subgroups, and further individuals in the college subgroups tended to enter only 2 or 3 of the post-college subgroups. These results supported the contention that as people move through the life, the paths they embark on are to a certain extent shaped by the path they are currently on, and paths they have been on in the past.

To explain the patterns that had been observed across the research, Mumford, Stokes, and Owens (1990) developed a general framework that they coined the ecology model. Simply put, the model assumes the individual to be a purposeful entity who seeks to maximize personal adaptation through learning, cognition, and external behavior over a lifetime (Mumford & Stokes, 1992). Throughout a person's life path, a number of different forces help to shape individuality. Whether it be heredity or experiential, the organism's outlook (which takes into account sensation, perception, and cognition) and associated behaviors will be predisposed contingent upon the environment. This makes the explicit conjecture that each person will seek to maximize environmental and internal rewards and will therefore act in particular ways or choose situations that will aid in this maximization. Since a series of environmental reinforcers and actions by the individual will tend to minimize the internal variability of what is deemed rewarding, the behavior of the organism, as demonstrated by choice of successive environments, will be channeled toward personal fulfillment. Further, choice of future reinforcers is dependent upon the present situation. This individual then develops a certain way of attaining goals that is to a large extent based on the past successes and failures of previous goal attainments. In this way, the individual's behavior patterns are shaped to the point that the old axiom that "the best predictor of future behavior is past behavior" becomes a reality.

Based on the findings of Mumford, Stokes, and Owens (1990), that the dimensions of personal classification that appeared to exhibit the most stability were those that

explained ways in which the organism actively interacts with its environment or tries to make sense of its environment, the idea of the individual being "active" in his or her individuation is a core theme to the model. This finding minimizes the influence of factors that "happen to" the individual or may be subconscious to the individual's perception. Accordingly, some individuals will not totally agree with the ecological framework of Mumford (Mumford & Nickels, 1990; Mumford, Stokes, and Owens, 1990). Mael (1991) falls into this category, and points to the present author's concerns as component reasons for his position. In addition to the negligible attention given to things that "happen to" the individual, coined *input variables* by Owens and Schoenfeldt (1979), and subconscious influences, Mael also points to the import of failures in shaping future behavior; in rebut to Mumford et al's (1990), emphasis on successes. Mael proposed using social identity theory, where the individual defines self-concept as an interaction between the personal and social identities, as a possible way of filling in some of the gaps left by the ecology model. Regardless of the model's shortcomings, it does remain the most completely articulated formulation for explaining biodata in terms of a theoretical foundation.

Biodata Item Characteristics and Development

As pointed out by many (Fine & Cronshaw, 1994; Mumford & Owens, 1987; Mumford & Stokes, 1992; Nickels, 1994; Owens, 1976; Russell, 1994) well thought out development and specification of biodata items is crucial to the measurement and evaluation of the constructs in question. As Brown (1994) elucidated, in addition to performance prediction, biodata item development may also serve the purpose of being the foundation for placement decisions, needs analysis, and theory building and testing. This makes it incumbent on the part of the researcher/user to have a well laid out framework for generating items, and determining how responses will be recorded and evaluated. These considerations are at the heart of establishing criterion, content, and construct-valid measures of developmental patterns. In addition, the practical and theoretical consequences (Messick, 1989) that result from the use of these measures must be paramount.

Buttressed by these considerations are a number of recommendations for ensuring well-grounded measurement of biodata constructs that are theoretically meaningful, psychometrically sound, and practically useful. It should be noted that these considerations are in no way unique to biodata, but are an essential part of any construct-based measurement, especially that which is explicitly linked to criteria performance. As noted by Mumford and Owens (1987), after determining a set of antecedent behaviors and experiences presumed to provide relevant linkages with a criterion of interest, criterion functioning should be defined precisely. This entails a full analysis and specification of particular levels of performance deemed important to capturing the essence of what a criterion is "all about." This may be accomplished in a number of ways, including obtaining information via: (a) job analysis (Fine & Cronshaw, 1994), (b) substantive literature pertaining to the criterion domain (Schoenfeldt & Mendoza, 1994), and (c) life history interview data (Russell, 1994).

Following this phase item stems are derived from the predictor-criterion domains and criterion specifications are developed. As mentioned earlier, Mael (1991) gives a thorough summary of biodata item characteristics including recommendations for item construction and usage. Though somewhat different from more cognitively oriented test items, a number of additional considerations for item construction were provided by Osterlind (1989). Mumford and Owens (1987) pointed out that during this stage, areas that cannot be measured with biodata (e.g., certain cognitive abilities) should be eliminated from consideration. In addition, the item developer should approach item development from an experimental or "hypothesis testing" frame of reference. Underlying each item specification is the implicit assumption that a linkage exists between the item and some specified later behavior.

A variety of item formats have been used in tests of achievement (Osterlind, 1989) that would not be amenable to items tapping biodata constructs. For example, using a matching, sentence completion, or cloze-procedure format, where a correct response is assumed, would not provide the individual completing biodata items freedom to answer in an honest fashion. On the other hand, multiple-choice, true-false, or short answer types, provided the stems were suitable, would be applicable in a biodata context. Though essay-type items offer a wealth of potential with regard to information that could be gained from biodata, the complexities involved in evaluating them precludes their practical use in most situations (Osterlind, 1989). All of the aforementioned types can be categorized into two basic groups: selected-response and constructed-response. Selected-response formats are those in which a number of alternatives are presented (in achievement tests, one will be deemed the correct response). The most common example of selected-response includes multiple-choice and true-false items, and it is these that have tended to be favored among practitioners of biodata. In constructed-response items, response alternatives are not provided, therefore requiring the respondent to answer with a word, short statement, or essay. Complexities involved in these items make their use in biodata particularly challenging. Pending future research these formats may help to increase our knowledge of biodata functioning (M.D. Mumford, personal communication, February 3, 1999). Of vital importance is the issue of item response format matching the developmental hypothesis.

Within the selected-response type of item, a number of different formats exist. Owens (1976) focused on seven of these, and provided examples of each. Of those reviewed, the organizing characteristics defining each item were whether the item allowed for multiple responses or only one; response options were graded along a continuum or not; and items provided an escape option (i.e., "does not apply"). For the purpose of scoring, continuum-type items can be viewed as single entities with multiple levels of the behavior or experience addressed by the item stem. For items that do not present response continua, each option must be viewed as an item unto itself. Explicit binary (e.g., those soliciting a true-false response) items are the simplest example of this. Non-continuum items with single or multiple response options are scored in such a way that each option becomes an item. For instance, an item with five possible options could be scored as five items. Of note is the scoring of escape options. These must be considered in light of the information solicited in the item stem, and the other possible responses available. A continuum-response item with escape option could be viewed as two separate items.

Mumford and Stokes (1992) cited three seminal studies addressing issues functional characteristics of alternative item formats. Lecznar and Dailey (1950) conducted a study in which item responses were either scored as a continuum or as separate items. They found that although both methods yielded comparable initial validities, the continuum scored method showed less shrinkage upon cross-validation. Owens, Glennon, and Albright (1962) evaluated item formats for retest consistency and found that the highest level of consistency was achieved when item stems were simple, direct, and neutral in connotation; responses were graduated on a continuum; and response options provided an escape option whenever necessary (Mumford & Stokes, 1992). Finally, Mumford and Stokes (1992) cite a study from 1990 by Reiter-Palmon, Uhlman, and DeFilippo, in which the authors attempted to evaluate item response continuums, via predictive ability, based on the connotation expressed (i.e., negative-positive, limiting-enhancing). They found that an item's ability to predict particular outcomes was a direct function of the connotation expressed by the response continuum. As Owens (1976) and others have pointed out, the preponderance of evidence suggests that the most appropriate format for recording biodata item responses is the continuum-type, with escape option provided.

In addition to the impact of item formats, a number of studies have focused on the issues of biodata accuracy and psychometric soundness. Regarding accuracy, the assumption is often made (Mitchell, 1998) that due to their self-report nature, biodata measures are to be viewed with skepticism. As Mitchell (1998) and others (Mumford & Owens, 1987; Mumford & Stokes, 1992) have been quick to point out; however, the research evidence for biodata's accuracy is favorable. In studies where biodata responses were compared with objective information (Cascio, 1975; Keating et al., 1950; Mosel & Cozan, 1952), and non-objective data from those familiar with the respondent (Mumford & Owens, 1987), the amount of agreement was high. In a study investigating biodata accuracy, Shaffer, Saunders, and Owens (1986) investigated responses to a survey and a five-year follow-up, and found that the more objective the item content, the greater the similarity. In the same study they solicited comparative information from the respondents' parents and found the same pattern (Shaffer, Saunders, & Owens, 1986). Though Klein and Owens (1965) reported that respondents were able to improve their scores when instructed to "fake good," that the effect of misrepresentation was minimized when clear definition of favorable responding was absent. Related to this, Mumford and Owens (1987) cite research indicating scores on a measure of social desirability are related to the responses to biodata items.

From a psychometric perspective, biodata present a sort of conundrum, as they defy some of the more conventional pieces of wisdom. Though a number of studies demonstrate a high degree of retest reliability, the very multidimensional nature of biodata prohibits their evaluation in terms of internal consistency indices. This, in conjunction with the well-known reputation of high criterion-related validity, often appears a riddle to those operating under the notion that a valid instrument must be a reliable instrument. When one considers that the primary method for keying biodata inventories has traditionally been via an empirically based procedure, the high validities make more sense.

Practical Recommendations

At a more practical level, a number of studies (Stokes, Mumford, & Owens, 1994), have documented biodata-type research programs that have led to the development and operational usage in practical settings. The Life Insurance Marketing and Research Association (LIMRA) has been in the business of developing, implementing, and maintaining a number of biodata instruments for well over fifty years (Brown, 1994). Thayer (1977) described one such instrument, the *Career Profile*, which has been used to successfully to predict life insurance sales success since the 1930's. Brown (1978) found little loss in predictive power when applying the original scoring key to data collected over forty years later.

A more recent effort conducted by the U.S. Office of Personnel Management, resulted in the *Individual Achievement Record (IAR)*, which was developed and validated as an aid in the selection and placement of entry-level federal professional and administrative positions (Brown, 1994). The *IAR* was developed specifically to tap four content areas (i.e., general aptitude, high school achievement, college achievement, and leadership skills). Gandy, Dye, and MacLane (1994) reported an average correlation of .4 between individuals' supervisor-provided performance ratings and their ratings as obtained via a weighted biodata inventory-based scoring procedure. In military settings, studies conducted by the Army (Erwin, 1984), Navy (Atwater & Abrahams, 1983), and the Air Force (Guinn, Johnson, & Kantor, 1975) have documented successes (and failures) of these efforts in the prediction of first term attrition. A comprehensive review and efforts aimed at laying out a program of assessing military service adaptability via biographical inventories is presented in Trent and Laurence (1993).

A collection of biodata items that can be used as a starting point for the construction of the biographical component of an adaptability screen is attached. It is proposed that these items be utilized in the initial data collection and keying efforts.

References

Allport, G. W. (1937). *Personality: A psychological interpretation*. New York: Holt, Rinehart, & Winston.

Asher, J. J. (1972). The biographical item: Can it be improved? *Personnel Psychology, 25*, 251-269.

Ashworth, S. D. (1989, April). The distinctions that Industrial/Organizational psychologists have between biodata and personality measurement are no longer meaningful. In T. W. Mitchell (chair), *Biodata vs. personality: The same or different classes of individual differences.* Symposium presented at the 4th annual conference of the Society for Industrial and Organizational Psychology, Boston MA.

Atwater, D. C., & Abrahams, N. M. (1983). *Adaptability screening: Development and initial Validation of the Recruiting Background Questionnaire (RBQ)* (NPRDC-TR-84-11). San Diego: Navy Personnel and Research Development Center.

Bliesener, T. (1996). Methodological moderators in validating biographical data in personnel selection. *Journal of Occupational and Organizational Psychology, 69,* 107-120.

Brown, S. H. (1978). Long-term validity of a personal history item scoring procedure. *Journal of Applied Psychology, 63,* 673-676.

Brown, S. H. (1994). Validating biodata. . In G. S. Stokes, M. D. Mumford, & W. A. Owens (Eds.), *Biodata handbook.* (pp. 199-236). Palo Alto CA: Consulting Psychologists Press, Inc.

Brush, D. H., & Owens, W. A. (1979). Implementation and evaluation of an assessment classification model for manpower utilization. *Personnel Psychology, 32*, 369-383.

Buss, A. H., & Plomin, R. (1975). *A temperament theory of personality development.* New York: Wiley.

Cascio, W. F. (1975). Accuracy of verifiable biographical information: Blank responses. *Journal of Applied Psychology, 60,* 767-769.

Cattell, R. B., & Coulter, M. A. (1966). Principles of behavioural taxonomy and the mathematical basis of the taxonome computer program. *British Journal of Mathematical and Statistical Psychology, 19,* 237-269.

Cattell, R. B., Coulter, M. A., & Tsujioka, B. (1966). The taxonometric recognition of types and functional emergents. In R. B. Cattell (Ed.), *Handbook of multivariate experimental psychology*. Chicago: Rand McNally.

Chambers, J. A. (1964). Relating personality and biographical factors to scientific creativity. *Psychological Monographs, 78* (7, Whole No. 584).

Cleary, T. A. (1966). An individual differences model for multiple regression. *Psychometrika, 31,* 215-224.

Costa, P. Jr., & McCrae, R. (1985). *The NEO personality inventory (Form S).* Odessa FL: Psychological Assessment Resources.

Cowles, J. T., & Dailey, J. T. (1949, September). *The utility of biographical inventories in classification test batteries.* Paper presented at the annual meeting of the American Psychological Association, Denver CO.

Cronbach, L. J. (1957). The two disciplines of scientific psychology. *American Psychologist, 12,* 671-684.

Dailey, C. A. (1960). The life history as a criterion of assessment. *Journal of Counseling Psychology, 7,* 20-23.

Davis, K. R. (1984). A longitudinal analysis of biographical subgroups using Owens' developmental-integrative model. *Personnel Psychology, 37,* 1-14.

Digman, J. M. (1990). Personality structure: Emergence of the five-factor model. *Annual Review of Psychology, 41,* 417-440.

Dunnette, M. D. (1963). A modified model for test validation and selection research. *Journal of Applied Psychology, 47,* 317-323.

Eberhard, C., & Owens, W. A. (1975). Word association as a function of biodata subgrouping. *Developmental Psychology, 11,* 159-164.

Eberhardt, B. J., & Muchinsky, P. M. (1984). Structural validation of Holland's hexagonal model: Vocational classification through the use of biodata. *Journal of Applied Psychology, 69,* 174-181.

England, G. W. (1971). *Development and use of weighted application blanks* (Rev. ed.). Minneapolis MN: Industrial Relations Center, University of Minnesota.

Erwin, F. W. (1984). *Development of new Military Applicant Profile (MAP) autobiographical questionnaires for use in predicting early Army attrition* (ARI Research Note 85-11). Alexandria VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

Equal Employment Opportunity Commission (1978). Uniform guidelines on employee selection procedures. *Federal Register, 43,* 38290-38315.

Farmer, W. L., & Witt, L. A. (1998, April). User reactions to biodata, personality, and cognitive ability tests. In T. W. Mitchell (Chair), *The utility and practical value of biodata*. Symposium conducted at the 13th annual conference of the Society for Industrial and Organizational Psychology, Dallas TX.

Feild, H. S., Lissitz, R. W., & Schoenfeldt, L. F. (1975). The utility of homogeneous subgroups and individual information in prediction. *Multivariate Behavioral Research, 10,* 449-461.

Feild, H. S., & Schoenfeldt, L. F. (1975a). Development and application of a measure of students' college experiences. *Journal of Applied Psychology, 60,* 491-497.

Fine, S. A., & Cronshaw, S. (1994). The role of job analysis in establishing the validity of biodata. In G. S. Stokes, M. D. Mumford, & W. A. Owens (Eds.). *Biodata handbook.* (pp. 39-64). Palo Alto CA: Consulting Psychologists Press, Inc.

Gandy, J. A., Dye, D. A., & MacLane, C. N. (1994). Federal government selection: The individual achievement record. In G. S. Stokes, M. D. Mumford, & W. A. Owens (Eds.). *Biodata handbook.* (pp. 275-310). Palo Alto CA: Consulting Psychologists Press, Inc.

Ghiselli, E. E. (1956). Differentiation of individuals in terms of their predictability. *Journal of Applied Psychology, 40,* 374-377.

Ghiselli, E. E. (1960a). Differentiation of tests in terms of the accuracy with which they predict for a given individual. *Educational and Psychological Measurement, 20,* 675-684.

Ghiselli, E. E. (1960b). The prediction of predictability. *Educational and Psychological Measurement, 20,* 3-8.

Glennon, J. R., Albright, L. E., & Owens, W. A. (1966). *A catalog of life history items.* Greensboro NC: Creativity Research Institute, Richardson Foundation.

Goldberg, L. R. (1972). Parameters of personality inventory construction and utilization: A comparison of prediction strategies and tactics. *Multivariate Behavioral Research Monograph, 72-2.*

Goldsmith, D. B. (1922). The use of the personal history blank as a salesmanship test. *Journal of Applied Psychology, 6,* 149-155.

Gordon, R. A. (1997). Everyday life as an intelligence test: Effects of intelligence and intelligence context. *Intelligence, 24,* 203-320.

Gottfredson, L. S. (1997). Why *g* matters: The complexity of everyday life. *Intelligence, 24,* 79-132.

Guinn, N., Johnson, A. L., & Kantoe, J. E. (1975). *Screening for adaptability to military service* (AFHRL-TR-75-30). Brooks Air Force Base TX: U.S. Air Force Human Resources Laboratory.

Guion, R. M. (1965). *Personnel testing.* New York: McGraw-Hill.

Gunter, B., Furnham, A., & Drakeley, R. (1993). *Biodata: Biographical indicators of business performance.* London: Routledge.

Hadley, J. M. (1944). The relation of personal data to achievement in a radio training school. *Psychological Bulletin, 41,* 60-63.

Hase, H. D., & Goldberg, L. R. (1967). Comparative validity of different strategies of constructing personality inventory scales. *Psychological Bulletin, 67,* 231-248.

Hein, M., & Wesley, S. (1994). Scaling biodata through subgrouping. In G. S. Stokes, M. D. Mumford, & W. A. Owens (Eds.). *Biodata handbook.* (pp. 171-196). Palo Alto CA: Consulting Psychologists Press, Inc.

Henry, E. R. (1966). *Research conference on the use of autobiographical data as Psychological predictors.* Greensboro NC: Creativity Research Institute, Richardson Foundation.

Himmelstein, P., & Blaskovics, T. L. (1960). Prediction of an intermediate criterion of combat effectiveness with a biographical inventory. *Journal of Applied Psychology, 44,* 166-168.

Hogan, J. B. (1994). Empirical keying of background data measures. In G. S. Stokes, M. D. Mumford, & W. A. Owens (Eds.). *Biodata handbook.* (pp. 69-108). Palo Alto CA: Consulting Psychologists Press, Inc.

Hornick, C. W., James, L. R., & Jones, A. P. (1977). Empirical item keying versus a rational approach to analyzing a psychological climate questionnaire. *Applied Psychological Measurement, 1,* 489-500.

Hough, L., & Paullin, C. (1994). Construct-oriented scale construction: The rational approach. In G. S. Stokes, M. D. Mumford, & W. A. Owens (Eds.). *Biodata handbook.* (pp. 109-146). Palo Alto CA: Consulting Psychologists Press, Inc.

Johnson, H. M. (1944). *On the actual and potential value of biographical information as a Means of predicting success in aeronautical training* (CAA-RN-32). Washington DC: Airman Development Division, Civil Aeronautics Administration.

Keating, E., Paterson, D. G., & Stone, C. H. (1950). Validity of work histories obtained by interview. *Journal of Applied Psychology, 34,* 6-11.

Klein, S. P., & Owens, W. A., Jr. (1965). Faking of a scored life history blank as a function of criterion objectivity. *Journal of Applied Psychology, 49,* 452-454.

Korman, A. K. (1968). The prediction of managerial performance: A review. *Personnel Psychology, 21,*295-322.

Lecznar, W. B., & Dailey, J. T. (1950). Keying biographical inventories in classification test batteries. *American Psychologist, 5,* 279.

Ledvinka, J., & Scarpello, V. G. (1992). *Federal regulation of personnel and human resource management* (3rd ed.). Belmont CA: Wadsworth.

Levine, A. S., & Zachert, V. (1951). Use of biographical inventory in the Air Force classification program. *Journal of Applied Psychology, 35,* 241-244.

Lewin, K. (1936). *Principles of topological psychology.* New York: McGraw-Hill.

Lissitz, R. W., & Schoenfeldt, L. F. (1974). Moderator subgroups for the estimation of educational performance: A comparison of prediction models. *American Educational Research Journal, 11,*63-75.

Lockman, R. F. (1954). *Multivariate statistical analyses of naval aviation cadet selection measures* (Project Research Rep. No. NM 001 057.04.05). Pensacola FL: U.S. Naval School of Aviation Medicine.

Long, J. A., & Sandiford, P. (1935). *The validation of test items* (Research Bulletin No. 3). Toronto ON: University of Toronto, Department of Education.

Mael, F. A. (1991). A conceptual rationale for the domain and attributes of biodata items. *Personnel Psychology, 44,* 763-792.

Mael, F. A., Connerly, M., & Morath, R. A. (1996). None of your business: Parameters of biodata invasiveness. *Personnel Psychology, 49,* 613-650.

Mael, F. A., & Schwartz, A. C. (1991). *Capturing temperament constructs with objective Biodata* (ARI Technical Report 939). Alexandria VA: U.S. Army Research Institute for the Behavioral and Social Sciences.

Magnusson, D. (1990). Personality development from an interactional perspective. In L. A. Pervin (Ed.), *Handbook of personality* (pp.193-222).

McDaniel, M. A. (1989). Biographical constructs for predicting employee suitability. *Journal of Applied Psychology, 74,* 964-970.

Messick, S. (1989). Validity. In R. L. Linn (Ed.), *Educational measurement* (3rd ed., pp. 13-103). New York: American Council on Education & Macmillan Publishing Company.

Mitchell, T. W. (1994). The utility of biodata. In G. S. Stokes, M. D. Mumford, & W. A. Owens (Eds.). *Biodata handbook.* (pp. 485-516). Palo Alto CA: Consulting Psychologists Press, Inc.

Mitchell, T. W. (chair) (1998, April). *The utility and practical value of biodata.* Symposium conducted at the 13th annual conference of the Society for Industrial and Organizational Psychology, Dallas TX.

Mitchell, T. W. (1998, Apr. 1). Personal communication.

Mitchell, T. W., & Klimoski, R. J. (1982). Is it rational to be empirical? A test of methods for scoring biographical data. *Journal of Applied Psychology, 67,* 411-418.

Mock, S. J. (1947). Biographical data. In, J. P. Guilford & J. I. Lacey (Eds.), *Printed classification tests. AAF Aviation Psychology Program Research Reports – Report No. 5.* Washington DC: U.S. Government Printing Office.

Morrison, R. F. (1977). A multivariate model for the occupational placement decision. *Journal of Applied Psychology, 62,* 271-277.

Mosel, J. N., & Cozan, L. W. (1952). The accuracy of application blank work histories. *Journal of Applied Psychology, 36,* 365-369.

Mumford, M. D., & Nickels, B. J. (1990). Making sense of people's lives: Applying principles of content and construct validity to background data. *Forensic Reports, 3,* 143-167.

Mumford, M. D., & Owens, W. A. (1987). Methodology review: Principles, procedures, and findings in the application of background data measures. *Applied Psychological Measurement, 11,* 1-31.

Mumford, M. D., Snell, A. F., & Reiter-Palmon, R. (1994). Personality and background data: Life history and self-concepts in an ecological system. In G. S. Stokes, M. D. Mumford, & W. A. Owens (Eds.). *Biodata handbook* (pp. 583-625). Palo Alto CA: Consulting Psychologists Press, Inc.

Mumford, M. D., & Stokes, G. S. (1992). Developmental determinants of individual action: Theory and practice in applying background measures. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology: Vol. 3* (2nd ed., pp. 61-138). Palo Alto CA: Consulting Psychologists Press, Inc.

Mumford, M. D., Stokes, G. S., & Owens, W. A. (1990). *Patterns of life history: The ecology of human individuality*. Hillsdale NJ: Lawrence Erlbaum Associates.

Mumford, M. D., Stokes, G. S., Owens, W. A., & Jackson, K. E. (1990). Sequential results. In M. D. Mumford, G. S. Stokes, & W. A. Owens, *Patterns of life history: The ecology of human individuality* (pp. 149-193). Hillsdale NJ: Lawrence Erlbaum Associates.

National Research Council (1946). *The history and development of the biographical inventory* (CAA-RN-70). Washington DC: Division of Research, Civil Aeronautics Administration.

Nickels, B. J. (1994) The nature of biodata. In G. S. Stokes, M. D. Mumford, & W. A. Owens (Eds.). *Biodata handbook.* (pp. 1-16). Palo Alto CA: Consulting Psychologists Press, Inc.

Novick, M. R. (1974). Moderator subgroups and Bayesian *m*-group regression: Some concluding remarks. *American Educational Research Journal, 11,* 91-92.

Novick, M. R., & Jackson, P. H. (1974). Further cross-validation analysis of the Bayesian *m*-group regression method. *American Educational Research Journal, 11,* 77-85.

Nunnally, J. C. (1959). *Tests and measurement: Assessment and prediction.* New York: McGraw-Hill.

O'Leary, L. R. (1973). Fair employment, sound psychometric practice, and reality. *American Psychologist, 28,* 147-150.

Osterlind, S. J. (1989). *Constructing test items: Multiple-choice, constructed response, performance, and other formats.* Boston: Kluwer.

Owens, W. A. (1953). Age and mental abilities: A longitudinal study. *Genetic Psychology Monographs, 48,* 3-54.

Owens, W. A. (1966). Age and mental abilities: A second adult follow-up. *Journal of Educational Psychology, 57,* 311-325.

Owens, W. A. (1968). Toward one discipline of scientific psychology. *American Psychologist, 23,* 782-785.

Owens, W. A. (1971). A quasi-actuarial basis for individual assessment. *American Psychologist,26,* 992-999.

Owens, W. A. (1976). Background data. In M. D. Dunnette (Ed.), *Handbook of industrial and organizational psychology* (pp. 609-644). Chicago: Rand McNally.

Owens, W. A. (1978). Moderators and subgroups. *Personnel Psychology, 31,* 243-247.

Owens, W. A., Glennon, J. R., & Albright, L. E. (1962). Retest consistency and the writing of life history items: A first step. *Journal of Applied Psychology, 46,* 329-331.

Owens, W. A., & Henry, E. R. (1966). *Biographical data in industrial psychology: A review and evaluation.* Greensboro NC: Creativity Research Institute, Richardson Foundation.

Owens, W. A., & Jewell, D. O. (1969). Personnel selection. *Annual Review of Psychology, 20,* 419-446.

Owens, W. A., & Schoenfeldt, L. F. (1979). Toward a classification of persons [Monograph]. *Journal of Applied Psychology, 64,* 569-607.

Pace, L. A., & Schoenfeldt, L. F. (1977). Legal concerns in the use of weighted applications. *Personnel Psychology, 30,* 159-166.

Pervin, L. A. (1990). A brief history of modern personality theory. In L. A. Pervin (Ed.), *Handbook of Personality* (pp. 3-18). New York: The Guilford Press.

Russell, C. J. (1994). Generation procedures for biodata items: A point of departure. In G. S. Stokes, M. D. Mumford, & W. A. Owens (Eds.). *Biodata handbook.* (pp. 17-38). Palo Alto CA: Consulting Psychologists Press, Inc.

Russell, C. J., Mattson, J., Devlin, S. E., & Atwater, D. (1990). Predictive validity of biodata items generated from retrospective life experience essays. *Journal of Applied Psychology, 75,* 569-580.

Russell, W., & Cope, G. V. (1925). A method of rating the history and achievements of applicants for positions. *Public Personnel Studies, 3,* 202-209.

Schmidt, F. L., & Hunter, J. E. (1998). The validity and utility of selection methods in personnel psychology: Practical and theoretical implications of 85 years of research findings. *Psychological Bulletin, 124,* 262-274.

Schneider, B. (1987a). The people make the place. *Personnel Psychology, 40,* 437-453.

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

Schneider, B., & Schneider, J. L. Biodata: An organizational focus. (1994). In G. S. Stokes, M. D. Mumford, & W. A. Owens (Eds.). *Biodata handbook.* (pp. 423-450). Palo Alto CA: Consulting Psychologists Press, Inc.

Schoenfeldt, L. F. (1974). Utilization of manpower: Development and evaluation of an assessment-classification model for matching individuals with jobs. *Journal of Applied Psychology, 59,* 583-595.

Schoenfeldt, L. F., & Lissitz, R. W. (1974). Moderator subgroups and Bayesian *m*-group regression: Some further comments. *American Educational Research Journal, 11,* 87-90.

Schoenfeldt, L. F., & Mendoza, J. L. (1994). Developing and using factorially derived biographical scales. In G. S. Stokes, M. D. Mumford, & W. A. Owens (Eds.). *Biodata handbook.* (pp. 147-170). Palo Alto CA: Consulting Psychologists Press, Inc.

Schooler, C. (1984). Psychological effects of complex environments during the life span: A review and theory. *Intelligence, 8,* 259-281.

Schwab, D. P., & Oliver, R. L. (1974). Predicting tenure with biographical data: Exhuming buried evidence. *Personnel Psychology, 27,* 125-128.

Shaffer, G. S., Saunders, V., & Owens, W. A. (1986). Additional evidence for the accuracy of biographical data: Long-term retest and observer ratings. *Personnel Psychology, 39,* 791-809.

Shultz, K. S. (1996). Distinguishing personality and biodata items using confirmatory factor analysis of multitrait-multimethod matrices. *Journal of Business and Psychology, 10,* 263-288.

Sternberg, R. J. (1985). Implicit theories of intelligence, creativity, and wisdom. *Journal of Personality and Social Psychology, 49,* 607-627.

Sternberg, R. J., & Grigorenko, E. L. (1997). Are cognitive styles still in style? *American Psychologist, 52,* 700-712.

Sternberg, R. J., & Lubart, T. I. (1996). Investing in creativity. *American Psychologist, 51,* 677-688.

Sternberg, R. J., Wagner, R. K., Williams, W. M., & Horvath, J. A. (1995). Testing common sense. *American Psychologist, 50,* 912-927.

Stokes, G. S. (1994). Introduction and history. In G. S. Stokes, M. D. Mumford, & W. A. Owens (Eds.). *Biodata handbook.* (pp. xv-xix). Palo Alto CA: Consulting Psychologists Press, Inc.

Strimbu, J. L., & Schoenfeldt, L. F. (1973). Life history subgroups in the prediction of drug usage patterns and attitudes. *JSAS Catalog of Selected Documents in Psychology, 3* (MS. NO. 412), 83.

Tesser, A., & Lissitz, R. W. (1973). On an assumption underlying the use of homogeneous subgroups for prediction. *JSAS Catalog of Selected Documents in Psychology, 3* (MS. NO. 336), 38.

Thayer, P. W. (1977). "Somethings old, somethings new." *Personnel Psychology, 30,* 513-524.

Toops, H. A. (1948). The use of addends in experimental control, social census, and managerial research. *Psychological Bulletin, 45,* 41-74.

Trent, T., & Laurence, J. H. (Eds.) (1993). *Adaptability screening for the Armed Forces.* Washington DC: Office of the Assistant Secretary of Defense (Force Management & Personnel).

Tyler, L. E. (1959). Toward a workable psychology of individuality. *American Psychologist, 14,* 75-81.

Wagner, R. K., & Sternberg, R. J. (1985). Practical intelligence in real-world pursuits: The role of tacit knowledge. *Journal of Personality and Social Psychology, 49,* 436-458.

Wernimont, P. F., & Campbell, J. P. (1968). Signs, samples, and criteria. *Journal of Applied Psychology, 52,* 372-376.

Appendix:
Suggested Biodata Items

Suggested Biodata Items

ALL the questions, which follow, are in a multiple-choice format. Answer each one by blackening the oval in the appropriate column of your choice. Choose the response that best fits you and **MAKE ONLY ONE RESPONSE PER QUESTION.**

ACADEMIC EXPERIENCE: HIGH SCHOOL	
1	During high school (grades 9-12) I made the semester honor roll: never once or twice three or four times five or six times seven or eight times
2	When I graduated from high school I was: 16 years old or younger 17 years old 18 years old 19 years old 20 years old or older
3	Relative to the other high school students in my major field of study, my most demanding teacher would most likely describe my academic work as: superior above average average below average don't know
4	During my last year in high school, my average number of hours of paid employment per week was: more than 20 16 to 20 hours 10 to 15 hours fewer than 10 hours none
5	Relative to the other high school students in my major field of study, my classmates would most likely describe my interpersonal skills as: superior above average average below average don't know

ACADEMIC EXPERIENCE: HIGH SCHOOL	
6	Relative to the other high school students in my major field of study, my classmates would most likely describe my leadership skills as: superior above average average below average don't know
7	My high school teachers would most likely describe my self discipline as: superior above average average below average don't know
8	My high school teachers would most likely describe my academic potential as: superior above average average below average don't know
9	My high school classmates would most likely describe the amount of my participation in extracurricular activities as: superior above average average below average don't know
10	My high school classmates would most likely describe my leadership in extracurricular activities as: superior above average average below average don't know
11	The number of different high school sports I participated in was: 4 or more 3 2 1 didn't play sports

ACADEMIC EXPERIENCE: HIGH SCHOOL	
12	The number of letters I received in high school sports was: 4 or more 3 2 1 0
13	The number of high school clubs and organized activities (such as band, newspaper, etc.) in which I participated was: 4 or more 3 2 1 didn't participate
14	My final year in high school, I was absent: more than 15 days 10 to 14 days 5 to 9 days fewer than five days never
15	During my years in high school, I was singled out for disciplinary reasons: 5 or more times 3 or 4 times twice once never
16	My class standing in high school put me in the: top 10% top 33% top 50% top 90% did not graduate from high school
17	The high school grade I most often received was: A B C D or lower don't remember
18	The number of high school courses which I failed was: 5 or more 3 or 4 2 1 none

ACADEMIC EXPERIENCE: HIGH SCHOOL	
19	The high school English grade I most often received was: A B C D or lower don't remember or didn't take English
20	The high school math grade I most often received was: A B C D or lower don't remember or didn't take math
21	The high school science grade I most often received was: A B C D or lower don't remember or didn't take science
22	The high school subject in which I received my lowest grades was: science math English history/social sciences physical education
23	The number of elected offices I held in high school was: 5 or more 3 to 4 2 1 none

ACADEMIC EXPERIENCE: UNDERGRADUATE COLLEGE	
24	My highest education level is: no college 1 to 2 years of college or associate degree 3 to 4 years of college, no degree Bachelor's degree advanced degree
25	During college the number of times I made the Dean's List was: 5 or more times 3 to 4 times 1 to 2 times never didn't go to college
26*	Prior to accepting my first job in my present job series, I last attended college as a full-time student: did not attend college less than a year prior to accepting my first job in my present series one year prior to accepting my first job in my present series 2 to 3 years prior to accepting my first job in my present series over 3 years prior to accepting my first job in my present series
27	During my last year in college, my average number of hours of paid employment per week was: more than 20 hours 10 to 20 hours fewer than 10 hours none didn't go to college
28	The number of different undergraduate colleges I attended prior to graduation was: 4 or more 3 2 didn't change colleges didn't go to college
29	The number of times I changed my college major before I selected the one in which I graduated was: 3 times or more 2 times 1 time didn't change majors didn't go to college

ACADEMIC EXPERIENCE: UNDERGRADUATE COLLEGE	
30	My class standing in college put me in the: top 10% top 33% top 50% bottom 50% didn't go to college
31	The college grade I most often received was: A B C D or lower didn't go to college
32	On a 4 point scale where A=4, my grade point average the first two years of college was: I did not go to college or went less than two years less than 2.90 2.90 to 3.19 3.20 to 3.49 3.50 or higher
33	My grade point average after the first two years of college was: I did not go to college or went less than two years less than 2.90 2.90 to 3.19 3.20 to 3.49 3.50 or higher
34	My grade point average in my college major was: I did not go to college or went less than two years less than 2.90 2.90 to 3.19 3.20 to 3.49 3.50 or higher
35	My overall grade point average in college was: I did not go to college or went less than two years less than 2.90 2.90 to 3.19 3.20 to 3.49 3.50 or higher

ACADEMIC EXPERIENCE: UNDERGRADUATE COLLEGE	
36	Of the following, the college subject in which I received my lowest grades was: science English math history/political science didn't go to college
37	The number of college courses in which I received a failing grade was: 3 or more 2 1 none didn't go to college
38*	At the time I applied for my present job series, my undergraduate education consisted of having completed: less than 30 semester hours (45 quarter hours) 30 to 59 semester hours (45 to 89 quarter hours 60 to 90 semester hours (90 to 134 quarter hours) more than 90 semester hours (135 quarter hours) but no degree Bachelor's Degree
39*	At the time I applied for my present job series, my graduate education consisted of having completed: 0 to 5 graduate semester hours (0 to 8 quarter hours) 6 to 11 graduate semester hours (9 to 17 quarter hours) 12 to 23 graduate semester hours (18 to 35 quarter hours) 24 graduate semester hours or more (36 quarter hours) Master's Degree, Ph.D. Degree, or other graduate degree
40	The college English grade I most often received was: A B C D or lower didn't take English or didn't go to college
41	The college math grade I most often received was: A B C D or lower didn't take math or didn't

ACADEMIC EXPERIENCE: UNDERGRADUATE COLLEGE	
42	The college science grade I most often received was: A B C D or lower didn't take science or didn't go to college
43	The number of times I elected non-required college English courses was: 3 or more 2 1 never didn't go to college
44	The number of times I elected non-required college math courses was: 3 or more 2 1 never didn't go to college
45	The number of times I elected non-required college science courses was: 3 or more 2 1 never didn't go to college
46	The proportion of my college expenses that I earned was: more than 50% 25% to 50% some but less than 25% none didn't go to college
47	The amount of my college expenses covered by scholastic scholarships was: more than 50% 25% to 50% some but less than 25% none didn't go to college
48	The amount of my college expenses covered by athletic scholarships was: more than 50% 25% to 50% some but less than 25% none didn't go to college

ACADEMIC EXPERIENCE: UNDERGRADUATE COLLEGE	
50*	Prior to accepting my first job in my present job series, I had been out of college for: 5 or more years 3 to 4 years 1 to 2 years less than one year didn't go to college or didn't graduate
51	The number of college clubs and organized activities (band, newspaper, etc.) in which I participated was: 3 or more 2 1 didn't participate didn't go to college
52	The number of letters I received in college sports was: 3 or more 2 1 0 didn't go to college
53	The number of student offices to which I was elected in college was: 3 or more 2 1 0 didn't go to college
54	The number of national scholastic honor societies I belong to in college was: 3 or more 2 1 0 didn't go to college

WORK EXPERIENCE	
55*	In the three years prior to accepting my first job in my present job series, the number of different paying jobs I held for more than two weeks was: 7 or more 5 to 6 3 to 4 1 to 2 none
56*	In the three years immediately before accepting my first job in my present job series, the number of different full or part-time jobs I applied for was: none 1 to 2 3 to 4 5 to 6 7 or more
57*	Prior to accepting my first job in my present job series, I had been employed in work similar to that of my present job for: never employed in a similar job less than 1 year 1 to 2 years 3 to 4 years over 5 years
58*	In the three years before accepting my first job in my present job series, the number of promotions I received in all previous jobs was: not employed 0 1 2 3 or more
59*	I left my last full-time job (or job series) because: I was laid off or discharged there was little chance for advancement or increase in pay important personal reasons - such as moving or pregnancy something else have never had a full time job
60*	Prior to accepting my first job in my present job series, I worked on my last full-time job (or job series): have not held full-time job less then six months 6 months up to a year one to two years more than two years

WORK EXPERIENCE	
61*	Prior to accepting my first job in my present job series, the number of different federal agencies I worked for (not :including military service) was: 0 1 2 3 4 or more
62*	I learned about the opportunity to apply for my present job series through: a public notice or media advertisement a friend or relative college recruitment working in some other capacity for the agency some other way
63	My military service was: none non-career enlisted non-career officer career enlisted career officer
64*	My employment status prior to accepting my first job in my present job series was: employed full-time employed part-time student, not employed self-employed unemployed
65*	The number of months I was unemployed during the three years immediately before accepting my first job in my present job series was: 0 1 to 2 3 to 4 5 to 6 7 or more
66*	Prior to accepting my first job in my present job series, I worked extra hours during evenings or on weekends: much more often than most persons in the job somewhat more often than most persons in the job about the same as most persons in the job somewhat less often than most persons in the job not employed prior to present job

WORK EXPERIENCE	
67*	In the three years immediately before accepting my first job in my present job series, my work experience (military or civilian) was in: professional or administrative occupations clerical or sales occupations service occupations trades or labor occupations not employed during the three years immediately before accepting my present job
68*	On my last job (prior to accepting my first job in my present job series), my supervisor rated me as: outstanding above average average below average not employed or received no rating
69*	Prior to accepting my first job in my present job series, I was late (tardy for work): once or twice a year or less once or twice in a six month period once or twice a month once or twice a week not employed prior to present job
70*	In the three years prior to accepting my first job in my present job series, the number of formal awards I received for my job performance was: not employed prior to present job 0 1 2 3 or more
71	The amount of time I have been out of work between jobs usually has been: never out of work less than one month 1 to 2 months 3 to 4 months 5 or more months

WORK EXPERIENCE	
72*	In the three years prior to accepting my first job in my present job series, the number of formal suggestions I submitted to my former employer(s) was: Not employed prior to present job 0 1 2 3 or more
73	The age at which I first started to earn money (other than an allowance) was: Less than 12 years old 12 to 13 years old 14 to 15 years old 16 to 17 years old 18 years or older
74*	In the year before accepting my first job in my present job series, the number of times I had been late for work (or class) was: More than 14 times 10 to 14 times 5 to 9 times fewer than five times never
75*	In the three years prior to accepting my first job in my present job series, the number of jobs I had been fired from was: 5 or more 3 to 4 2 1 none
76*	Prior to accepting my first job in my present job series, I was asked to serve as supervisor in my boss' absence: somewhat more often than most about the same as most others somewhat less often than most much less often than most not employed prior to present job
77*	Prior to accepting the first job in my present job series, I was selected to attend training: somewhat more often than most about the same as most others somewhat less often than most much less often than most not employed prior to present job

WORK EXPERIENCE	
78*	Prior to accepting my first job in my present job series, I was chosen to serve on special task forces or committees at work: somewhat more often than most about the same as most others somewhat less often than most much less often than most not employed prior to present job

SKILLS	
79	The number of civic organizations or social organizations (which have regular meetings and a defined membership) that I belonged to prior to accepting my present job is: None 1 2 or 3 4 or 6 7 or more
80	Which one of the following have you ever organized or assisted in organizing? If you organized more than one, mark the one most important to you. Athletic team or sport competition Financial or charity campaign to raise funds Some other civic, social, work related, or professional organization Have never organized or assisted in organizing any club or group
81	The number of elective offices (other than in high school or college organizations) I have held in the last five years is: None 1 or 2 3 or 4 5 or 6 7 or more
82	In organizations to which I belong, my participation is best described as: do not belong to any organizations not very active a regular member but not an office holder have held at one important office have held several important offices
83	My previous supervisor (or teachers if not previously employed) would probably describe my attendance record as: more worse than my peers somewhat worse than my peers about the same as my peers somewhat better than my peers much better than my peers
84	My previous supervisor (or teachers if not previously employed) would most likely describe my problem solving skills as: superior above average average below average don't know

SKILLS	
85	My previous supervisor (or teachers if not previously employed) would most likely describe my skill at thinking on my feet as: superior above average average below average don't know
86	My previous supervisor (or teachers if not previously employed) would likely describe the amount of supervision that I need as: more than average average less than average very little don't know
87	My previous supervisor (or teachers if not previously employed) would most likely describe my dependability as: superior above average average below average don't know
88	My previous supervisor (or teachers if not previously employed) would most likely describe the speed at which I work as: superior above average average below average don't know
89	My previous supervisor (or teachers if not previously employed) would most likely describe the amount of time I needed to complete assignments as: a great deal more than average average less than average don't know
90	My previous supervisor (or teachers if not previously employed) would most likely describe my skill at meeting deadlines under pressure as: superior above average average below average don't know

SKILLS	
91	My previous supervisor (or teachers if not previously employed) would most likely describe me as taking on more than I can handle: Most of the time a great deal of the time sometimes infrequently don't know
92	My previous supervisor (or teachers if not previously employed) would most likely describe me as mastering my assignments: Most of the time a great deal of the time sometimes infrequently don't know
93	My previous supervisor (or teachers if not previously employed) would most likely describe my supervisory potential as: superior above average average below average don't know
94	My previous supervisor (or teachers if not previously employed) would most likely describe my skill at getting along with others as: superior above average average below average don't know
95	My previous supervisor (or teachers if not previously employed) would most likely describe my oral communication skills as: superior above average average below average don't know
96	My previous supervisor (or teachers if not previously employed) would most likely describe my self control as: superior above average average below average don't know

SKILLS	
97	My previous supervisor (or teachers if not previously employed) would most likely describe my responsiveness to other person's viewpoints as: superior above average average below average don't know
98	My previous supervisor (or teachers if not previously employed) would most likely describe my skill at speaking before a group as: superior above average average below average don't know
99	My previous supervisor (or teachers if not previously employed) would most likely describe my logical reasoning skills as: superior above average average below average don't know
100	My previous supervisor (or teachers if not previously employed) would most likely describe my planning and organizing skills as: superior above average average below average don't know
101	My previous supervisor (or teachers if not previously employed) would most likely describe my analytical skills as: superior above average average below average don't know
102	My previous supervisor (or teachers if not previously employed) would most likely describe my basic math skills as: superior above average average below average don't know

SKILLS	
103	My previous supervisor (or teachers if not previously employed) would most likely describe my vocabulary as: superior above average average below average don't know
104	My previous supervisor (or teachers if not previously employed) would most likely rate my writing skills as: superior above average average below average don't know
105	My previous supervisor (or teachers if not previously employed) would most likely rate my speed of reading skill as: superior above average average below average don't know
106	My previous supervisor (or teachers if not previously employed) would most likely rate my reading comprehension skill as: superior above average average below average don't know
107	My previous supervisor (or teachers if not previously employed) would most likely rate my skill at doing several different jobs at the same time as: superior above average average below average don't know
108	My previous supervisor (or teachers if not previously employed) would most likely describe my attention to detail as: superior above average average below average don't know

SKILLS	
109	My previous supervisor (or teachers if not previously employed) would most likely describe my ability to recall facts and details of information as: superior above average average below average don't know
110	My previous supervisor (or teachers if not previously employed) would most likely describe my skill at getting work done on time as: superior above average average below average don't know
111	The number of years of leadership experience I have had (such as work supervisor, commissioned or non-commissioned officer, scout patrol leader, school or social club president, athletic captain, etc.) is: 5 or more years 3 or 4 years 2 years 1 year
112	In the past six months, the average number of hours per week I spent reading newspapers, books, magazines, etc. outside of work is: 5 or more hours per week 3 to 4 hours per week 2 hours per week 1 hour per week less than 1 hour per week
113	My peers would likely rate my interpersonal skills as: superior above average average below average don't know
114	On a list of 100 typical people in the kind of job I can do best, my peers would probably place me in the: top 10% top 25% top 50% top 75% top 90%

SKILLS	
115	In terms of punctuality, my peers would probably say that I usually arrive: much later than most lather than most on time earlier than most much earlier than most
116	If you were to ask my peers, they would probably say that the amount of recognition I receive relative to my accomplishments is: a great deal less than deserved somewhat less than deserved as much as is deserved somewhat more than deserved much more than deserved
117	My peers would probably say that the highest level I could reach if I chose a career in a major corporation would be: a top level executive (e.g. vice president) a middle manager a first level supervisor a professional or technical expert other non-supervisory technical or administrative position
118	My peers would probably describe me as a person who: never takes chances hardly ever takes chances sometimes take chances often takes chances very often takes chances
119	My peers would probably describe me as: much more aggressive than most of my peers somewhat more aggressive than most of my peers about as aggressive as most of my peers somewhat less aggressive than most of my peers much less aggressive than most of my peers
120	My peers would probably say that getting me to change once I have made up my mind is: much harder than most somewhat harder than most about the same as most somewhat easier than most much easier than most

SKILLS	
121	Which of the following communication situations would your peers say you would handle best? writing a lengthy report giving a lecture or speech to a large group mixing and conversing with a room full of strangers discussing a topic with another individual don't know
122	Which of the following would your peers say describes your behavior in a group situation? you freely express your views, and sway the group considerably you freely express your views, but the group does not always share them you are reluctant to express your views, but when you do they are usually well received you usually don't express your views don't know
123	Which of the following would your peers say describes your behavior in a social situation? always at ease in social situation almost always at ease in a social situation generally at ease in a social situation occasionally at ease in a social situation don't know
124	My peers would probably say that having someone criticize my performance (i.e., point out a mistake) bothers me: much less than most somewhat less than most about the same as most somewhat more than most much more than most
125	My peers would probably describe me as being: much more confident than most somewhat more confident than most about as confident as anyone else somewhat less confident than most much less confident than most
126	Which of the following would your peers consider your weakest trait? learning new things quickly composing effective written report working with and getting along with other people speaking and expressing yourself effectively to others working well under pressure

SKILLS	
127	Which of the following would your peers consider your strongest trait? learning new things quickly composing effective written report working with and getting along with other people speaking and expressing yourself effectively to others working well under pressure
128	My peers would likely rate my skill in influencing people to my point of view as: superior above average average below average don't know
129	Compared to others in my unit, my rate of promotion in the military was: much faster than most somewhat faster than most about the same as most somewhat slower than most never served in the military
130	Compared to others on my last full-time job, my rate of promotion was: much faster than most somewhat faster than most about the same as most somewhat slower than most not employed full-time prior to present job
131	Prior to accepting my present job I: never worked for this agency worked part-time for this agency while in college worked for this agency during summer vacations while in college worked full-time for this agency for a period of but then resigned was employed full-time with this agency immediately prior to accepting my present job
132	Before I joined the government, the information I had about the type of work that air traffic controllers are expected to do was: none practically no information some information quite a bit knew in considerable detail

SKILLS	
133 *	Prior to accepting my first job in my present job series, the amount of formal training that I had (other than college) related directly to my present job was: less than 6 months 6 months to a year 1 to 2 years 3 to 4 years 5 or more years
134	During my teens, I usually spent most of my summers (choose one): taking life easy attending summer school attending honors classes working part-time working full-time
135	Before accepting my present job, the length of time I had worked shift work was: never worked shift work less than 6 months 6 to 12 months 13 months to 2 years more than 2 years
136	The number of times in the past five years I was denied an award I deserved is: never once or twice three or four times five or six times seven or more times
137	In the past year, I have been annoyed by my coworkers: never rarely occasionally frequently constantly
138	Compared to my peers, I find myself leading others: much more often than most somewhat more often than most about the same as most somewhat less than most much less often than most

SKILLS	
139	Compared to my coworkers, people come to me for advice: much more often than most somewhat more often than most about the same as most somewhat less than most much less often than most
140	if I could have any full-time job I wanted, the reason I would pick the job which I would finally choose is that: I would be recognized for the work I do I would be with people I really like I would have the freedom to be creative I would have great possibilities for monetary rewards I could do the kind of work that I find very interesting
141	when I think about being a ____?___, the first thing that turns me off most about the job is that: achieving anything of significance might be difficult doing the same things over and over might be boring lacking control over my work activities would be frustrating having little prestige as a controller would be unsatisfying working under constant pressure could be very hard
142	The aspect of being an __?__ that appeals to me most is that: my job is secure in the future I'm responsible for the safety of many others I'll receive a good salary which will grow I'll be constantly challenged to resolve situations which arise the work will always be interesting

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