Attitudes and Self-Perceptions of Emergency Physicians: The Systematization of Factor Interpretation

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ABSTRACT: Emergency medicine has recently received significant public attention as a consequence of prime time TV programs. Little literature exists that describes the attributes and self-perceptions of emergency physicians. The present pilot study evaluates practitioners of emergency medicine through the use of Q methodology. Five main attitudinal groups were observed that describe the qualities needed for successful accommodation of the demands of caring for a large volume of patients with a multitude of ailments and high level of acuity. These are Adapters, Processors, Sprinters, Administrators and Stressors. This fifth group's description may account for the relatively high rate of practitioners leaving the field for less stressful areas of medicine. Factor interpretation is traditionally done by exclusive evaluation of the Factor Scores Array Table. A detailed approach for a systematic interpretation of factor meaning is offered as an illustration of the inductive process for new workers using Q methodology.

Introduction

The popular perception of physicians, what they do and how they act has evolved in recent times. This representation has been shaped, to a great degree, by the powerful images portrayed by television. In a previous generation, physicians were expected to behave as professionals depicted in programs such as "Marcus Welby, MD," "General Hospital" and "Dr. Kildare." The increasingly urban, thrill-seeking audiences have led advertisers and producers to create TV programs in which physicians play leading roles. At present, shows such as "ER" and "Chicago Hope" have become popular standards to which physicians are compared.

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Emergency medicine is one of the youngest medical specialties. The American College of Emergency Physicians has been in existence for only 37 years. The certification body for emergency physicians (EPs), the American Board of Emergency Medicine (ABEM) was recognized as recently as 1979 by the American Board of Medical Specialties (ABEMemo, 1995). Other professional organizations, such as the American College of Osteopathic Emergency Medicine and the American Osteopathic Board of Emergency Medicine have existed since 1975 and 1980, respectively.

In recent years, the popularity of the specialty is evident both in the success of TV programs as well as an increase in the number of graduating medical students applying to emergency medicine residency programs across the country (Binder, 1997). In this year's match (a computerized coupling of applicants and residency programs) only the highest qualified medical students were considered as potential candidates.

A number of questions arise – What kind of person chooses emergency care as a career? Are there specific attributes common to emergency medicine practitioners? What are the perceptions EPs have of themselves and of their chosen career? Who are the best candidates to become caretakers of a large volume of patients with a multitude of ailments, high level of acuity in a compassionate and unhurried manner?

Medical literature dealing with physicians' attitudes and self-perceptions in general is scarce and vague (Carmel, 1993; Gabbard, 1985; Silver, 1992). A number of reasons may explain this: 1) Physicians are frequently busy professionals who do not lend themselves to performing such studies. 2) There is great variability of attitudes in different specialties. 3) Physicians frequently practice in a variety of settings that would result in many different attitudinal groups. 4) Typical quantitative research studies do not address these issues well.

Within medical environments, specialists often describe each other in a jocular manner through stereotypes and clichés, frequently in rather derogatory ways. Examples of these include: Radiologists – "They live in a world of shadows." Surgeons – "Life begins when the cold steel (scalpel) meets the warm flesh;" or "They don't know anything, but they solve everything." Internists – "They know everything, but do not solve anything." Pathologists – "They know everything, solve everything, but too late." Psychiatrists – "They do not know anything, they do not solve anything, and it does not matter, anyway." The list continues, with each specialty being depicted in its own unique way.

Some attempts have been made to profile physicians' personalities in family medicine through the use of the Myers-Briggs Type indicator (MBTI) The MBTI, which describes personality attributes through the use of traditional qualitative methods, classifies professionals according to a previously structured theoretical framework. One typical study mainly assessed residents prior to completing

training, and the design possibly reflects the difficulty in recruiting and evaluating practicing professionals (Quenk, 1975; Harris, 1985; Taylor, 1990). A similar study is described in physical medicine and rehabilitation (Sliwa, 1994). Friedman (1988) has studied the relationship between the MBTI and career choice.

Because they study and work in a much more controlled environment and are easily accessible, medical students are frequent targets of personality profiling studies. Student profiles have been compared and mapped according to future specialty choices in an attempt to determine which type of people seek certain specialties. Consequently, a much larger body of literature is reported that relates medical student perceptions, personality traits and career choices (Schumacher, 1963, 1964; Bruhn, 1964, 1965; Zimny, 1970; Furnham, 1986; Parkhouse, 1988; Yufit, 1969; Lieu, 1989; Golden, 1989; Zeldow, 1991; Henry, 1992). These studies use a variety of qualitative approaches, including MBTI and focus groups. Additionally, they do not offer any follow up into the years of mature professional practice for attitudes and perceptions of career physicians.

Previous studies in emergency medicine that address attitudes and work styles were done through the use of questionnaires (Sanders, 1992, 1994) and data reported by emergency medicine residency program directors (Meislin, 1992). All of them were concerned mainly with evaluating the academic aspects of emergency medicine. Although they came close to determining some of the important elements that play roles in career choice and success, these results were presented in non-descriptive aggregates and are prone to the limitations inherent to collection and analysis of subjective data by traditional questionnaire and survey methods.

The present small study is a pilot project in which the investigators attempted to define the self-perceptions and some of the attitudes of practicing EPs. Through the use of Q methodology, it addresses many of the limitations of the earlier studies. In the discussion of how the resulting attitudinal groups were derived, a systematic method for evaluation of a computer printout from PQMethod is described in some detail. This could serve as a teaching tool for beginners, as they are introduced to Q methodology and its nuances of the intuitive inductive method for interpreting the results of a Q study.

Study Design

The assembly of the items from a concourse dealing with EPs' self-perceptions and attitudes was done by submitting the following open-ended questionnaire to 15 EPs: 1) What image comes to your mind when you think of an EP? 2) Please elaborate on the good attributes of an EP. 3) What, if any, are the detrimental characteristics of an EP? 4) How does an EP differ from other specialists among primary care givers? 5) Please elaborate on the lifestyle of an EP.

Items were included in the initial pool of statements that delineate some of the known clichés and stereotypes used to describe EPs: "The EP lives for the adrenaline rush." "The EP is a glorified triage person." "Emergency physicians shoot from their hips." Other sources used for the establishment of the concourse

included recent emergency medicine literature that discusses some problems faced by EPs – "burnout" (Goldberg, 1996) and virtues an EP should cultivate (SAEM ethics committee, 1996). From the concourse a 49 statement Q sample (Appendix Table 1) was selected in an unstructured manner that covered many aspects of the practice of emergency medicine.

The resulting Q sample was given to EP staff members from four hospitals in the Chicago metropolitan area for Q sorting using the condition of instruction: "Sort these statements considering why you are in emergency medicine, and how you respond to situations in your daily activities in the emergency department." Twenty-six out of 58 practicing EPs returned their completed Q sorts. Eighteen respondents were from urban, academic hospitals, while 8 were from suburban, non-academic hospitals. the investigators performed Q analysis using PQMethod 2.0b.[2] Simple structure was obtained by varimax rotation. Q sorts loading heavily and purely on any single factor, as listed in Appendix Table 2, were flagged as factor definers for the performance of the final calculation.

In Search Of A Systematic Interpretation Of Factor Structure

It is generally agreed that there is no single strategy for interpretation of factor structure (Brown, 1980). For a beginner in Q methodology, utilizing the inductive method for interpretation of a study remains one of the most difficult steps to master. This usually requires the completion of several studies side-by-side with an experienced Q methodologist before many of the nuances of interpretation become evident. Once mastered, this intuitive process becomes second nature and interpretation becomes simply an issue of understanding the computer printout as summarized in the Factor Scores Array and determining the meaning for each of the factors obtained.

Traditionally, inductive interpretation of the factors is performed exclusively by carefully examining the array of factor scores with special attention being given to the factor scores attributed to each item (Stephenson, 1967). Item grouping based on factor scores leads to inductive understanding of the meaning of each factor. Tentatively, a descriptive label is created for each factor that attempts to suggest the meaning ascribed to that attitudinal group. However, this is usually a puzzling process. When the factor interpretation process is first explained to someone unfamiliar with
Q methodology, skepticism about the whole process can result for the novice.
In this paper, a systematic approach for inducing factor meaning is proposed which takes advantage of the richness of information available in a computer printout prepared by PQMethod. Careful evaluation and summary of the pertinent sections in the computer printout can usually lead to some undeniable conclusions. The

[2] http://www.rz.unibw-muenchen.de/~p41bsmk/qmethod/

results can be independently verified by performing a detailed comparison of the label applied to each factor with each Q item and its accompanying factor scores in the Factor Scores Array. As this comparison is done, statements which seem not to belong to a certain factor group will logically lead the researcher back to the computer printout, the Q sample, and possibly to the specific Q sort which originated that piece of information.

Developing a Worksheet

In an effort to include all the information available in the PQMethod printout about each factor in the inductive interpretation, a summary worksheet (Table 2) was developed. There are two major difficulties in interpreting factors: 1) inadequate integration of all the information available in the printout; as well as 2) clarifying the meaning of the synthetic Q sort produced for each factor by PQMethod. The worksheet includes the following summaries of sections from the computer printout: 1) salient statements from the synthetic Q sort obtained from the **Normalized Factor Scores**; 2) **Distinguishing Statements** for each factor; 3) identification of flagged respondents used in forming the synthetic Q sorts; and 4) the **Array of Differences** between individual factors. Each section in the worksheet was derived from the related section in the PQMethod printout..[3]

The worksheet represents a map for the study. It can be used as the main guide for interpretation and is a complete reference about the study. If specific questions arise during the interpretive process that would clarify factor meaning, this map can be used as a guide to the computer printout, to individual Q sorts, and ultimately to interviews of individual respondents, as necessary.

In the paragraphs that follow, the use of each section of the worksheet in developing an understanding of the factor solution is discussed in detail. Except for the section entitled **Array of Differences Between Factors**, factor characteristics are listed columnwise in the worksheet.

Attributes of the Factor

These are derived from the synthetic Q sorts and produced by the weighted average of the normalized factor scores from the Q sorts of the definer respondents flagged for that factor. It is intended to represent a profile of that factor. Statements located at the extremes of the distribution represent the strongest feelings for and against (like and dislike, agree and disagree, etc.) the topic being investigated, depending on the condition of instruction. An initial insight into the meaning of each factor may be obtained by knowing the extremes in opinions held by definers on each factor. Consequently, it is natural to assume that the first step in finding the meaning consists in carefully examining and documenting statement preferences for each factor.

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[3] Consensus statements were not included on this worksheet because the calculation error in the original version of PQMethod had not yet been rectified at the time of this study. Current versions of PQMethod allow full use of identified consensus statements.

Items from the Q sample were listed in descending order of significance, using an absolute Z score of 1 as cutoff (Table 2 – Attributes of the Factors). This arbitrary cutoff was used because it probably represents less than 40% of the items sorted, or those statements falling one or more standard deviations from the mean, in either direction. Items with which respondents agreed strongly (Z scores >+1), are listed in descending order by absolute value. These were not expressed necessarily as originally worded, but in a brief descriptive format to assist in characterizing the factor. In other words, if the statement was worded negatively and ranked as a disagreement, it was rephrased here positively. Listing the likes/dislikes, agreements/ disagreeements for each factor, side by side, allows for quick comparison and contrast – an important feature of this worksheet.

Distinguishing Statements for Factors

The distinctive statements for the factors are those items considered to be statistically unique for each synthetic Q sort because no other factor has given these statements such peculiar consideration. Even though they may not have significantly high Z scores, they make evident the singular points of view for each factor. In a similar manner to that discussed in the previous section, these sentences were listed descriptively for each factor and not in their original wording, taking into consideration whether the Z scores were positive or negative.

Factor Definer Q sorts

In this section, Q sort identifier numbers are given for respondents who defined each factor. This allows for immediate referral to any particular defining Q sort and subsequently to the respondent's demographic information in search of clues that might reveal or clarify meaning for the factor. In this study, there was added interest in clarifying some apparent inconsistencies in the placement of some statements, especially in the interpretation of factor 4. Table 2 also identifies the loading for the flagged factor-definer respondents.

Array of Differences Between Factors

This portion of the printout can offer a particularly useful perspective in the interpretation of factors. For any two factors, the ranked differences between the synthetic factor scores (in standardized Z scores) are arrayed. This display offers some unique insights about the factors. In this study the arrays of differences were particularly useful in understanding factor 5. Because the array of differences results from the subtraction of Z scores, it can be thought of as a "differences Q sort" between the two factors being compared.

For this study, the statements listed in the worksheet were included only if they fulfilled the following criteria: 1) Z score had an absolute value greater than one; and 2) items were at opposite sides of Z=0. Stated in another way, the difference in Z scores between two statements were entered the worksheet only if the statements received factor scores at opposite poles of the synthetic
Q sort for the factor, and the difference in the Z scores of the particular statements exceeded ±1.0. The rationale for this criterion is that the focus needs to be placed

on item differences that reveal polarity between factors to help determine factor meaning.

Factor Interpretation

Finding Meaning

After all the pertinent information is compiled into the worksheet, the interpretation can proceed. In addition to the worksheet, the investigator should have at hand the respondents' Q sorts, the corresponding demographic information and the PQMethod computer printout. The process of preparing the worksheet leads the researcher to review all the pertinent information regarding the study. A "gut feeling" of what each factor represents will probably have been obtained during the compilation of the worksheet. The questions to be answered are: What does this factor mean and what descriptive label can be given to each factor that simply and quickly conveys a sense of meaning?

In order to integrate the information available, each factor is studied individually by reading from the worksheet the characteristics as listed columnwise. This is followed by the comparisons of that particular factor with all the others in the Array of Differences Between Factors. Sentences that repeatedly surface allow for a "profile" of the factor to emerge.

Labeling a factor becomes easier if a short summary is prepared which describes the factor profile as observed in the evaluation of the worksheet. With this in mind, an Interpretation Sheet was developed (Appendix Table 3). Space is provided where the summary description can be written out prior to final factor labeling. Indeed, many of the descriptive terms that form the factor profile in the worksheet are simply transferred to the summary description of the factor in the interpretation sheet. The strongest characteristics of the factor can be highlighted in bold type in order to emphasize the relative importance of that term in the final labeling of the factor.

All the information is then re-evaluated. With a good "hunch" of what a factor may represent, after comparing demographic information and after carefully considering those respondents who defined that particular factor (if they are known to the researchers), a tentative label can be created which summarizes and accurately describes each factor. This method for ascription of factor meaning differs from the traditional inductive interpretation only in that all the relevant interpretive information from the PQMethod printout is explicitly written out and summarized to facilitate visualization of similarities and differences between factors.

Verifying Factor Interpretation Results

In order to verify the adequacy and appropriateness of the factor profile and label, and as a means of filling possible gaps in the interpretive process, the newly derived factor labels are tested against each Q item and its corresponding scores in the PQMethod Factor Scores Array. By performing this verification of results, the novice Q analyst obtains an insight about the process used by an experienced

Q methodologist who may find factor meaning by simply looking at the Factor Score Arrays.

Because these considerations have been of great help in obtaining and clarifying the results to be discussed below, this worksheet method of factor definition may hold value for individuals teaching Q methodology. Its efficacy in leading new Q investigators to verifiable factor interpretations can be tested in the classroom setting by allowing individual students to develop worksheets and create labels. These can be compared for differences and similarities in a group setting.

Results

Emergency physicians, as determined by evaluation of Q sorts from 26 hospital staff physician respondents, can be described in terms of four distinct factor attitudinal groups – Adapter, Processor, Sprinter and Administrator. A fifth factor – defined by a single sorter – and labeled Stressor, was not very clearly delineated. It may, however, prove to be of great significance, because it points to the important problem of "burnout" in this area of medicine (Chapman, 1997; Rund, 1997).

Statements toward which there seems to be (at least) some degree of consensus across all 5 factors include:

Statement	*Factors*				
	I	*II*	*III*	*IV*	*V*
23 ...inflexible and rigid	-4	-5	-3	-3	-2
27 ...able to prioritize	1	2	2	3	3
31 ...one who has unconditional regard	0	-2	-1	-2	0
32 ...one who handles stress well	0	1	2	1	0
39 ...subject to substance abuse	-2	-2	-1	-2	-5

Factor I – Adapter (3 definers, 5 loaders)

Adapters' self-perceptions include being a good listener and insightful about a patient's real needs. They take time to feel what the patient might be feeling. More than any other group, they consider themselves as just and fair towards their patients. They also perceive themselves as skillful in establishing rapport and in defusing difficult situations. Adapters feel they are, more than any other group, likely to balance compassion and efficiency. Of all the groups, they are the only ones who consider themselves as easygoing. When compared to the other groups, they perceive themselves as less likely to make hasty dispositions. They also feel neutral towards making quick decisions. Regarding meaning, it is possible that when cared for by Adapters, patients may remain for a longer period of time in a busy emergency department. On the other hand, they consider themselves

organized in performing their duties. Their factor scores suggest they are not in emergency medicine because they seek instant gratification and they do not see themselves as easily frustrated by the difficulties they face. The term "adapter" was chosen because these physicians tend to accommodate to each patient's needs as well as staff.

Q items that characterize Adapter physicians' attitude:

Statement	*Factor*				
	I	*II*	*III*	*IV*	*V*
41 ...insightful of people's real needs	5	3	-1	-2	0
49 ... not a good listener	-5	-4	-2	-1	-1
47 ...able to orchestrate patient care	4	2	2	4	3
26 ...just and fair	4	-1	-1	-1	0
22 ...one who makes hasty dispositions	-4	0	-2	-1	-2
23 ...inflexible and rigid	-4	-5	-3	-3	-2
45 ...skillful in establishing rapport	3	2	0	0	2
46 ...able to defuse conflict situations	3	1	0	1	1

Factor II – Processor (2 definers, 4 loaders)

Processors are physicians who perceive themselves as best at handling (processing) multiple critical situations. This is a valued characteristic shared with the Sprinters (Factor III). Processors consider themselves flexible, more so than the other four groups. Processors, on the other hand, contrast sharply with the Sprinters in that they are suspicious of conditions each evaluated patient may have that could be life threatening. However, they are not hypervigilant. Processors have an interest in keeping things moving in the emergency department, but are not quite as quick as the sprinters in decision making. Possibly because of their promptness in dealing with problems, the Processor shares with the Sprinter a tendency toward burnout, but certainly not to the same degree as does the Stressor.

Processors, along with Adapters, perceive themselves to be good listeners. Processors appear sensitive to criticism from other specialties and they feel like others are constantly scrutinizing them. Together with the Administrators, Processors are not easily frustrated with difficult situations they encounter. Processors share with the Administrators and Sprinters feelings that they are at the forefront of medical care. These three groups also share the point of view that they do not necessarily have unconditional regard for their patients. Processors are the least likely to be concerned with details when caring for a patient. Finally, they consider themselves to have patience in what they do and see themselves to be the most flexible of the four groups. The term "processor" was chosen for this group because, in addition to being flexible, they are quick in decision making, placing somewhat less attention on pleasing patients and staff.

Q items that characterize Processor physicians are:

Statement	*Factor*				
	I	*II*	*III*	*IV*	*V*
19 ...handles multiple critical situations	1	5	4	1	0
23 ...inflexible and rigid	-4	-5	-3	-3	-2
34 ...suspicious of life threats	0	4	-3	2	0
5 ...easily frustrated	-3	-4	-2	-4	2
42 ...procedurally oriented	-2	3	-1	0	-1
4 ...scrutinized by other specialties	1	3	-4	2	1
29 ...impatient	-2	-3	0	0	-1
21 ...detail oriented	-1	-3	-2	-2	2
11 ...hypervigilant	0	-3	1	2	2

Factor III – Sprinter (2 definers, 4 loaders)

This group's label was chosen to capture the excitement these definers apparently feel for their profession, for their readiness to act when faced with difficult situations, and the speed of their decision-making. More than any other group, they feel like they are fighting a front line battle. They see in themselves the ability to handle multiple situations, although perhaps not quite to the same extent as the Processors. Their group appears least concerned with scrutiny from other practice specialists to whom they send their patients. This group, differently from other factors, seeks instant gratification from the performance of their duties. Although to a lesser degree than the Administrators, Sprinters are not concerned with the issues of chronic care.

Sprinters accept full responsibility for their decisions and they do not agree with the suggestion that their work is dull or repetitive. They consider themselves idealistic about their work. Unlike the Processors, Sprinters do not consider themselves to be suspicious of the worst in every patient they see, but they are hypervigilant about their patients. If a problem is faced, they promptly deal with it in an almost reflexive manner. This group also feels like they are better prepared for dealing with the stress inherent to emergency medicine.

Q items that characterize them are:

Statement	*Factor*				
	I	*II*	*III*	*IV*	*V*
17 ...in the front line of health care	2	4	5	4	1
44 ...a repetitive, routine worker	-3	-3	-5	0	-4
4 ...scrutinized by other specialties	1	3	-4	2	1
28 ...one who accepts responsibility	0	-1	3	-1	-1
3 ...a seeker of instant gratification	-3	0	3	-2	-1
16 ...a quick decision maker	0	1	3	3	2
38 ...idealistic	-1	0	2	-3	-4
32 ...one who handles stress well	0	1	2	1	0

Factor IV – Administrator (2 definers, 6 loaders)

Administrators are characterized by their practical, common sense approach to emergency medicine. Because of this, they may be more likely to prioritize care appropriately. Although not quite as much as the Adapters, Administrators consider themselves to be organized and efficient. They are also in the group least concerned with chronic health care issues. Along with the Processors and just behind the Sprinters, Administrators consider themselves at the front line of medical care, and they are the least likely to be financially motivated in their career choice. Administrators also see themselves as able to balance compassion and efficiency, but it is interesting to note that they also see themselves as the least likely to be insightful regarding the patient's real needs. They certainly do not consider themselves perfectionists. Another interesting finding in this group is the significant stressor effect on the family. This item received salience in this factor because of the placement of item #30 in a single Q sort. The respondent was interviewed, and volunteered that stress was related to factors outside the work of the emergency department; and, therefore, a lesser importance was given to the item (+2) placed in the synthetic Q sort for the factor. Because this factor is only weakly defined by 2 Q sorts, its details may change as other individuals become identified with this viewpoint.

Characterizing Q items for this factor are:

Statements	*Factor*				
	I	*II*	*III*	*IV*	*V*
2 ...practical, has good common sense	2	2	3	5	1
14 ...concerned with chronic care issues	-1	-3	-4	-5	-2
10 ...a perfectionist	-2	-2	0	-4	2
5 ...easily frustrated	-3	-4	-2	-4	2
36 ...financially motivated	-1	0	-3	-4	-3
17 ...in the front line of health care	2	4	5	4	1
16 ...a quick decision maker	0	1	3	3	2
43 ...balance compassion and efficiency	3	2	1	3	0
30 ...has significant family stressors	-2	-2	-2	2	-2
41 ...insightful of peoples' real needs	5	3	-1	-2	0

Factor V – Stressor (single definer and loader)

This factor, characterized by only one respondent, received its label not only because of the salient items observed in the single defining Q sort, but because of how it was uniquely different from all the other factors. Many of the positive characteristics of this factor are noticed to exist in the other four groups. These include having broad base knowledge, not being subject to substance abuse, not being a repetitive worker, not being financially motivated and that of feeling confident about the profession. The similarities end here.

Except for the fact that the respondent has a good sense of humor, the remaining differences portray some disturbing characteristics. These include the significantly high score for the risk for burnout, a lack of idealism, the feeling of being overextended, of being easily frustrated, the lack of creativity, being detail-oriented and a perception of deep knowledge of specialty care. Because it was defined by only one respondent, it is likely that this factor, should it be found in a more broadly-based P-set, may not be congruent with this Q sort.

Characterizing items include:

Statements	*Factor*				
	I	*II*	*III*	*IV*	*V*
18 ...one who has broad knowledge base	2	2	4	3	5
39 ...subject to substance abuse	-2	-2	-1	-2	-5
33 ...subject to burnout	-2	2	1	-2	4
24 ...one who has a good sense of humor	1	0	1	0	4
38 ...idealistic	-1	0	2	-3	-4
6 ...frequently overextended	0	-1	-1	1	3
7 ...confident	1	0	0	0	3
25 ...creative	2	0	0	1	-3
48 ...deep knowledge of specialty care	-3	-2	-3	-3	1

Discussion

Regarding the methodology

Inductive interpretation of factor structure, as presently described, bears analogy to disease diagnosis in the medical field. Even though experienced clinicians are frequently able to make the correct diagnosis and tentatively decide on an appropriate treatment plans upon entering a patient's room, this skill is not inborn. It is developed over years of contact with patients. It requires skillful recognition of the subtle signs and symptoms a patient presents. With those in mind, a directed interview usually will be sufficient to substantiate the initial impression. Because of significant variability in the presentation of diseases, as well as significant overlap in the presentation of many pathologies, it is frequently necessary to perform additional diagnostic tests that will, in most cases, and in a more objective manner, confirm or reject the working diagnosis. In some cases, with the lack of confirmatory results, interventions are made in an empirical manner based solely in the inductive interpretation of the presenting symptoms and the likelihood of a diagnosis.

The development of this pattern recognition skill begins with a medical student and evolves over time as an individual progresses through the various steps of education and training. Initially, it is necessary for the trainee to laboriously interview a patient, asking each and every question regarding pertinent and not pertinent signs and symptoms. The patient is then meticulously examined from head to toe. The findings are carefully documented in a formatted history and

physical (H&P) form that will serve as guide for the presentation of the case to professionals at higher levels (intern, residents, attending physician). The student is then required to make a plan and tentatively determine a likely diagnosis – analogous to hypothesis generation – and the possible necessary tests, which would confirm or reject the proposed hypothesis.

As students progress in the training to becomes interns, residents and finally staff attending physicians, they perfect the ability to recognize quickly and reliably the subtle patterns of disease their mentors talk about, thus characterizing the master/apprentice nature of medical training. With recent emphasis on evidence-based practice of medicine, this process has been further refined not only to learn from experiences obtained from mentors, but also from the best concrete evidence that supports (or refutes) the subjective concepts the mentors try to inculcate on a daily basis.

Q methodology is inherently difficult to learn and use, but it is nothing less than a clearly defined process for those experienced with its use. Learning and incorporating its premises is a process not unlike the training of a physician. Once all the necessary theoretical considerations regarding by-person factor analysis have been learned and/or accepted as being representative of the structure of the subjective topic studied, the Q methodologist needs to learn how to recognize the pattern of that structure. By using a system of worksheets similar to the medical H&P forms, all the pertinent and relevant data are documented, facilitating the profiling of each of the resulting factors.

Once the factor summary and labels are written out, the verification of suitability of the labels is tested and evaluated by having them compared again to each factor score the Q items receive in the Factor Scores Array. This consists of testing the tentative hypothesis originally held by the interpreter upon making the initial induction for that factor. With the passing of time and the performance of several studies, the now-experienced researcher will no longer need to follow such laborious processes in order to obtain sound verifiable results. However, should questions arise, documentation will always be helpful in arriving at trustworthy results. By creating and using worksheets, a trainee will not only "see" the subjective structure as seen by the experienced mentor, but will be able to notice the evidence upon which those results are based.

Regarding factors

Emergency medicine has become a popular medical specialty, both in the eyes of the public (Jones, 1997), as well as in the pool of prospective residency trainees (Lieu, 1989; Binder, 1997). Although the relationships between medical students' personality profiles and their residency specialty training choices have been studied (Yufit, 1969; Furnham, 1986; Zeldow, 1991), there are no reports in the literature that have attempted to catalog the desired qualities of successful future practitioners of emergency medicine. Factors influencing career choices in emergency medicine include lifestyle (Schwartz, 1989), income, opportunity to perform procedures and the degree of diagnostic uncertainty (Lieu, 1989, Sanders,

1992). Determining attitudes and self-perceptions of EPs through the use of Q sorts and by-person factor analysis may be helpful in determining the desired qualities of residency applicants.

In the present study, the perceptions and attitudes of the 26 EPs who submitted their Q sorts can be classified in 4 distinct groups. As previously described, these are the Adapter, Processor, Sprinter, and Administrator. The fifth group was not well characterized because it was defined by only one respondent. These groups may be suggestive of prevalent attitudinal groups of currently practicing EPs. This warrants further evaluation in a larger scale study. It is, however, of great importance, given the high rate of attrition for emergency physicians (Thomas, 1991; Gallery, 1992). It is labeled Stressor. Although there is a certain degree of overlap, the unique features of each approach to the practice of emergency medicine are demonstrated in the description of each group.

Being a relatively new specialty, emergency medicine has tried already to redefine itself. Recently, 10 core virtues were described as desirable in EPs (SAEM Ethics committee, 1996). The Adapter group might possibly concentrate a larger number of listed desired virtues an EP should have, as described by the Society for Academic Emergency Medicine Ethics Committee (SAEM Ethics Committee, 1996). These include justice, compassion and trustworthiness. The other groups share varying degrees of the same virtues, but Processors are more likely to have prudence, while Sprinters are more vigilant. Sprinters and Administrators share agility in decision making. Additionally, Administrators are noted to be prudent and compassionate.

Attrition due to "burnout" has been significant in emergency medicine, probably because of the inherently stressful conditions from working in an emergency department. This problem has been directly addressed by several emergency medicine professional organizations (Goldberg, 1996; Rund, 1997; Chapman, 1997; Cordover, 1997). The Stressor factor is of particular interest, even though only one respondent loaded exclusively on it. Whether that Q sort suggests the existence of burnout cannot be answered positively in this project. More subjects loading on the "Stressor" factor would be needed to clearly outline risk for burnout.

As implied throughout the discussion of the results, it is important to reemphasize that the resulting attitudinal groups obtained in this study depict only the perceptions of these respondents. Because of the great variability in the ethnic, cultural and training background of a large body of practitioners in emergency medicine, it would be presumptuous to state that the responses from only two individuals could truly be representative of a larger number of physicians classified in each category. In order for these characteristics to truly represent these groups, a significantly larger number of participants would be required.

The clear delineation of self-identified traits needed for success in emergency medicine, with the use of Q methodology may lead to the identification of potentially successful emergency medicine practitioners. Perhaps the conduct of

larger studies in which profiles of "burn out" and the characteristic attitudes of those at risk might point the way to the development of an intervention strategy to mitigate this important professional concern.

Conclusions

Inductive interpretation via exclusive examination of the Factor Score Arrays is certainly a practical approach to ascribing meaning to factors. This is, however, surely a difficult process to be learned by beginners in
Q methodology. By laboriously examining and documenting details from the PQMethod output, students of Q methodology could learn more easily how to integrate all aspects of the inductive interpretation process.

Q sorts constructed by 26 respondent emergency physicians from the Chicago area are not homogeneous. They comprise at least four different attitudinal groups, demonstrating that people with different attitudes can successfully practice emergency medicine. A fifth group may represent those who become unable to cope with the stress inherent to the practice of emergency medicine. Because of the small number of respondents, no generalizations can be offered from this study, but it may point the way for the design and conduct of a larger study. The small initial study reported here has shown that Q methodology can be used to evaluate and profile the subjective opinions of emergency physicians about themselves and the importance of their work to society.

Appendix

Table 1: Q sample and Factor Arrays -The emergency physician is...

No.	Statement	Factor Arrays				
		I	*II*	*III*	*IV*	*V*
1	...easy going	2	-2	-2	0	0
2	...practical, has good common sense	2	2	3	5	1
3	...a seeker of instant gratification	-3	0	3	-2	-1
4	...scrutinized by other specialties	1	3	-4	2	1
5	...easily frustrated	-3	-4	-2	-4	2
6	...frequently overextended	0	-1	-1	1	3
7	...confident	1	0	0	0	3
8	...self controlled	1	0	-1	-1	-2
9	...one who works hard/plays hard	0	-1	1	1	-3
10	...a perfectionist	-2	-2	0	-4	2
11	...hypervigilant	0	-3	1	2	2
12	...agile and resilient	1	0	2	1	-1
13	...a primary care giver	-1	-1	2	-2	0
14	...concerned with chronic care issues	-1	-3	-4	-5	-2
15	...an advocate for the underserved	0	1	1	1	-2
16	...a quick decision maker	0	1	3	3	2
17	...in the front line of health care	2	4	5	4	1
18	...one who has broad knowledge base	2	2	4	3	5
19	...handles multiple critical situations	1	5	4	1	0
20	...organized, efficient	3	1	0	2	1
21	...detail oriented	-1	-3	-2	-2	2
22	...one who makes hasty dispositions	-4	0	-2	-1	-2
23	...inflexible and rigid	-4	-5	-3	-3	-2
24	...one who has a good sense of humor	1	0	1	0	4
25	...creative	2	0	0	1	-3
26	...just and fair	4	-1	-1	-1	0
27	...able to prioritize	1	2	2	3	3
28	...one who accepts responsibility	0	-1	3	-1	-1
29	...impatient	-2	-3	0	0	-1
30	...has significant family stressors	-2	-2	-2	2	-2
31	...one who has unconditional regard	0	-2	-1	-2	0
32	...one who handles stress well	0	1	2	1	0
33	...subject to burnout	-2	2	1	-2	4
34	...suspicious of life threats	0	4	-3	2	0
35	...one who has an erratic lifestyle	-2	0	-2	0	-3
36	...financially motivated	-1	0	-3	-4	-3
37	...trustworthy and honest	2	0	0	-1	1
38	...idealistic	-1	0	2	-3	-4
39	...subject to substance abuse	-2	-2	-1	-2	-5
40	...one who has aggressive hobbies	-2	-2	0	-1	1
41	...insightful of people's real needs	5	3	-1	-2	0
42	...procedurally oriented	-2	3	-1	0	-1
43	...balance compassion and efficiency	3	2	1	3	0
44	...a repetitive, routine worker	-3	-3	-5	0	-4
45	...skillful in establishing rapport	3	2	0	0	2
46	...able to diffuse conflict situations	3	1	0	1	1
47	...able to orchestrate patient care	4	2	2	4	3
48	...deep knowledge of specialty care	-3	-2	-3	-3	1
49	... not a good listener	-5	-4	-2	-1	-1

Table 2: Emergency Physician Attitudes Worksheet

Attributes of the Factors*				
I: Adapter	**II: Processor**	**III: Sprinter**	**IV: Administrator**	**V: Stressor**
Insightful of people's needs Orchestrate care Just and fair Balance compassion/efficiency Able to defuse conflict	Handles multiple critical situations Front line of care Suspicious of life threats Scrutinized by others Insightful into peoples' needs Prioritizes	Front line of care Handles multiple critical situations Broad knowledge Seeks instant gratification Quick decision maker Accepts responsibility Orchestrate patient care	Practical, common sense Front line of care Orchestrate patient care Prioritize Broad knowledge base Quick decision maker Balance compassion /efficiency	Broad knowledge Good sense of humor Overextended Confident Prioritizes Orchestrate patient care
Good listener No hasty disposition Flexible Not seeking instant gratification Not easily frustrated Not repetitive worker	Flexible Not easily frustrated Good listener Not a repetitive worker Patient No concern with chronic issues Not detail oriented Not hypervigilant Not perfectionist	Not a repetitive worker Not scrutinized No concern with chronic issues Not suspicious of life threats Flexible Not financially motivated No deep knowledge Good listener Not easily frustrated No erratic lifestyle	No concern with chronic issues Not perfectionist Not financially motivated No deep specialty knowledge Flexible Not idealistic	Not subject to substance abuse Not a routine worker Not idealistic Not financially motivated No erratic lifestyle Work hard/play hard Not creative

Table 2 (cont'd.)...

Distinguishing Statements for Factors				
I: Adapter	**II: Processor**	**III: Sprinter**	**IV: Administrator**	**V: Stressor**
Just and fair Seek no instant gratification Make no hasty dispositions	Procedurally oriented Financially motivated Not hypervigilant	Seek instant gratification Accept responsibility Not suspicious Not scrutinized	Family stressors Not routine worker No concern with chronic issues	Good sense of humor Detail oriented Easily frustrated Deep specialty knowledge Not scrutinized Not advocate for underserved Not creative

Factor Definer Loadings (flagged)									
I: Adapter		**II: Processor**		**III: Sprinter**		**IV: Administrator**		**V: Stressor**	
Respondent No.	Loading	Respondent No.	Loading	Respondent No.	Loading	Respondent No.	Loading	Respondent No.	Loading
9 16	0.70 0.63	18 24	0.71 0.76	16 19	0.79 0.68	1 21	0.68 0.70	7	0.44

Table 2 (cont'd.)...

Array of Differences Between Factors				
I-II	**I-III**	**I-IV**	**I-V**	**II-III**
I - Just and fair I - Easy going	I - Scrutinized by others I - Insightful into people's needs I - Just and fair I - Easy going	I - Insightful into people's needs I - Just and fair I - Trustworthy and honest I - Has unconditional regard	I - Creative I - Insightful into people's needs I - Just and fair I - Balance compassion/ efficiency I - Self-controlled I - Advocate for underserved I - Scrutinized by others I - Agile and resilient I - Easy going	II - Suspicious of life threats II - Scrutinized by others II Insightful into people's needs II - Financially motivated II - Erratic lifestyle II - Hasty dispositions
Hasty dispositions - II Procedurally oriented II Suspicious of life threats - II Subject to burnout - II	Seek instant gratification - III Quick decision maker - III Primary care giver - III Subject to burnout - III	Has family stressors - IV Quick decision maker - IV Suspicious of life threats - IV Hypervigilant - IV	Subject to burnout - V Perfectionist - V Detail oriented - V Deep specialty knowledge - V Aggressive hobbies - V Hypervigilant - V	Hypervigilant - III Seek instant gratification - III Accept responsibility - III Impatient - III Perfectionist - III Primary care giver - III

Table 2 (cont'd.)...

Array of Differences Between Factors - continued				
II-IV	**II-IV**	**III-IV**	**III-V**	**IV-V**
II - Insightful into people's needs II - Financially motivated II - Procedurally oriented	II - Handle multiple critical situations II - Scrutinized by others II - Suspicious of life threats II - Procedurally oriented II - Erratic lifestyle II - Financially motivated II - Advocate for underserved II - Creative II Insightful into people's needs	III - Idealistic III - Seek instant gratification III - Primary care giver III - Accepts responsibility	III - Idealistic III - Handle multiple critical situations III - Seek instant gratification III - Accepts responsibility III - Work hard/play hard III - Creative III - Advocate for underserved III - Agile and resilient	IV - Family stressors IV - Work hard/play hard IV - Creative IV - Scrutinized by others IV - Advocate for underserved IV - Erratic lifestyle
Hypervigilant - IV Family stressors - IV Impatient - IV	Easily frustrated - IV Hypervigilant - IV Perfectionist - IV Good sense of humor - IV Overextended - IV	Scrutinized by others - IV Suspicious of life threats - IV Family stressors - IV Erratic lifestyle - IV	Easily frustrated - V Deep specialty knowledge - V Overextended - V Detail oriented - V Suspicious of life threats - V Confident - V	Easily frustrated - V Perfectionist - V Subject to burnout - V Deep specialty knowledge - V Detail oriented - V

Table 3: Emergency Physician Attitudes Interpretation Sheet
The Interpretation Sheet contains the summary of the interpretation of what factor each represents to the researcher, and is based on the annotated results from the Worksheet. Boldfact type indicates extreme scores.

Factor Description	Factor Label
Just and fair, good listener, trustworthy and honest, flexible, organized, careful dispositions, **defuses conflict,** not easily frustrated, does not seek instant gratification, self controlled, **easy going**	**I Adapter**
Handles chaos, front line of health care, **suspicious of life threats,** flexible, **feels scrutinized,** insightful, **procedurally oriented,** not easily frustrated, patient, financial motivation, neutral to disposing of patients' problems hastily	**II Processor**
Front line of care, handles chaos, **seeks instant gratification,** quick decision maker, **not suspicious of life threats,** subject to burnout, hypervigilant, **accepts responsibility,** considers self as primary care giver	**III Sprinter**
Practical, front line of care, **orchestrates patient care,** not perfectionist, prioritizes care, no concern with chronic issues, not financially motivated, suspicious of life threats, hypervigilant, **family stress,** flexible, quick decision maker	**IV Administrator**
Broad knowledge, **overextended, easily frustrated,** confident, **not idealistic,** good sense of humor, detail oriented, perfectionist, suspicious, deep knowledge of specialty, **subject to burnout,** less self control	**V Stressor**

References

ABEMemo, December 1995, p.1.

Binder, L.S. (1997). Preliminary report: 1997 NRMP match in EM. SAEM Newsletter, 9, 5,8.

Brown, S.R. (1980). "Technique and method." Political subjectivity: Applications of Q-methodology in political science. Yale University Press.

Bruhn, J.G. & Parsons, O.A. (1964). Medical student attitudes toward four medical specialties. J of Med Educ, 39, 40-49.

Bruhn, J.G. & Parsons, O.A. (1965) Attitudes toward medical specialties: Two follow-up studies. J of Med Educ, 40, 273-280.

Carmel S. & Glick, S.M. (1993). Compassionate physicians: Personality traits and prosocial attitudes. Psych Reports, 73, 1362.

Chapman, D.M. (1997). Burnout in emergency medicine: What are we doing to ourselves? Acad Emerg Med, 4:4, 245-247.

Cordover, M. (1997). Early self-diagnosis of physician burnout. ACEP News, 16:5, 4.

Friedman, C.P. & Slatt, L.M. (1988). New results relating the Myers-Briggs Type Indicator and medical specialty choice. J Med Educ, 63, 325-327.

Furnham, A. (1986). Career attitudes of preclinical medical students to the medical specialties. J Med Educ, 20, 286-300.

Gabbard, G.O. (1985). The role of compulsiveness in the normal physician. JAMA, 254:20, 2926-2929.

Gallery, M.E., et al. (1992). A study of occupational stress and depression among emergency physicians. Ann of Emerg Med 21:1, 58-64.

Goldberg, R., et al (1996). Burnout and its correlates in emergency physicians: Four years' experience with a wellness booth. Acad Emerg Med 3:12, 1156-1164.

Golden, W.E. (1989). Initial career choices of medical school honors graduates in the early 1970s and 1980s. Acad Med 10, 616-621.

Harris, D.L. & Ebbert, P. (1985). Personality types of family practice residents as measured by the Myers-Briggs Type Indicator. Fam Med, 17:1, 8-10.

Henry, P., Leong, F.T.L. & Robinson, R. (1992). Choice of medical specialty: Analysis of students' needs. Psych Reports, 71, 215-224.

Jones, T. (1997). TV networks approach a reckoning. (Sunday, June 1) Chicago Tribune, Sec. 5 (Business), p.1.

Lieu, T.A., Schroeder, S.A. & Altman, D.F. (1989). Specialty choices at one medical school: Recent trends and analysis of predictive factors. Acad Med, 10, 622-629.

Meislin, H.W., Spaite, D.W. & Valenzuela T.D. (1992). Meeting the goals of academia: Characteristics of emergency medicine faculty academic work styles. Ann Emerg Med 21:3, 298, 302.

Parkhouse, J. & Ellin, D.J. (1988). Reasons for doctors'career choice and change of choice. Brit Med J, 296, 1651-1653.

Quenk, N. & Heffron, W.A. (1975). Types of family practice teachers and residents: A comparative study. J Fam Pract, 2:3, 195-200.

Rund, D.A., Munger, B.S. & Reinhart, M.A. (1997). Longitudinal study of emergency physicians by the American Board of Emergency Medicine: 1995 interim survey results. Ann Emerg Med, 29:5, 617-620.

SAEM Ethics Committee. (1996). Virtue in Emergency Medicine. Acad Emerg Med 3:10, 961-6.

Sanders, A.B., et al. (1992). Factors influencing resident career choices in emergency medicine. Ann Emerg Med 21:1, 47-52.

Sanders, A.B., et al. (1994). Characteristics influencing career decisions of academic and nonacademic emergency physicians. Ann Emerg Med 23:1, 81-87.

Schumacher, C.F. (1963). Interest and personality factor as related to choice of medical career. J Med Educ, 38, 932-942.

Schumacher, C.F. (1964). Personal characteristics of students choosing different types of medical careers. J Med Educ, 39, 278-288.

Schwartz, R.W. et al. (1989). Controllable lifestyle: A new factor in career choice by medical students. Acad Med 64:10, 606-9.

Silver, A. (1992). Paternalistic attitudes and moral reasoning among physicians at a large teaching hospital. Acad Med, 67, 62-63.

Sliwa, J.A. & Shade-Zeldow, Y. (1994). Physician personality types in physical medicine and rehabilitation as measured by the Myers-Briggs Type Indicator. Am J Phys Med & Rehab, 73:5, 308-312.

Stephenson, W. (1967). The play theory of mass communication. University of Chicago Press. Chicago, pp. 13-32.

Taylor, M.A., Clark, C. & Sinclair, A.E. (1990). Personality types of family practice residents in the 1980s. Acad Med, 65:3, 195-200.

Thomas, H. et al. (1991). Faculty attrition among three specialties. Ann Emerg Med 20:1, 11-15.

Yufit, R.I., Pollock, G.H. & Wasserman, E. (1969). Medical specialty choice and personality. Arch Gen Psych, 20, 89-99.

Zeldow, P.B. & Daugherty, S.R. (1991). Personality profiles and specialty choices of students from two medical school classes. Acad Med, 66:5, 283-287.

Zimny, G.H. & Thale, T.R. (1970). Specialty choice and attitudes toward medical specialties. Soc Sci & Med, 4, 257-264.