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(54) Title: APPLICATION OF MULTI-MEDIA TECHNOLOGY TO COMPUTER ADMINISTERED VOCATIONAL PERSONNEL ASSESSMENT
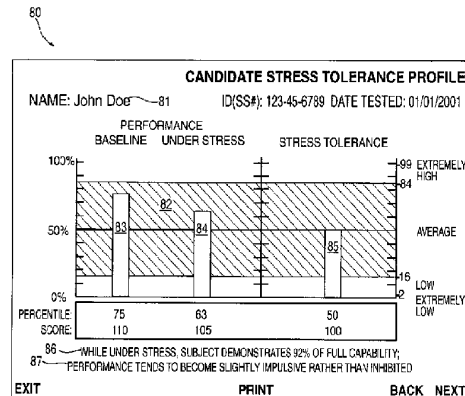
(57) Abstract: A multi-media method and system performs psychological assessment of an individual (81) for suitability for particular jobs, whereby the individual is shown and provided with discrete visual and auditory stimuli on a multi-media computer screen, so that the individual's responses can be monitored in conjunction with physiological responses received by biofeedback sensors. The computer tallies the test subject's recorded responses. Virtual work environments are optionally displayed, to enable the tested individual to simulate a real work environment. Unlike other job evaluation systems, the system evaluates a job candidate's ability to maintain task focus under pressure. It directly measures performance under pressure (80), rather than only inferring potential performance based upon selective input from a job candidate.

APPLICATION OF MULTI-MEDIA TECHNOLOGY TO COMPUTER
ADMINISTERED VOCATIONAL PERSONNEL ASSESSMENT

FIELD OF THE INVENTION

5   This invention is related to interactive multi-media
applications in psychological testing for vocational
assessment, which evaluates a job candidate's ability to
maintain task focus under pressure, rather than only
inferring performance based upon selective input from a
10   candidate.

RELATED APPLICATIONS

       This application is based upon my United States
provisional patent application no. 60/277,140 filed March 19,
2002.

15   This application is related to my prior PCT application
number PCT/US97/05817 and my pending United States
application serial no. 09/395,548, filed September 11, 1999,
which is a continuation of United States application serial
no. 08/829,488, filed March 27, 1997, now U.S. Patent No.
20   6,030,226 dated February 29, 2000, which is based on United
States Provisional Application Serial no. 60/014,203, filed
on March 27, 1996.

       My prior United States patent applications are concerned
with applications of multimedia technology for psychological
25   and educational assessment tools. My prior applications are
an improvement over conventional psychological and
educational assessment tools which have been used for the
measurement and evaluation of abilities, aptitudes,
personality characteristics and so forth, such as the
30   intelligence quota (IQ) test dating back to 1904 of the
French psychologist Alfred Binet that would identify slow
learners.

       The specification and drawings of my patent points out
the basic difference between the application of multimedia
35   tools to psychological and educational assessments that are
the subject of my invention and, in contrast, the rudimentary

skill acquisition or remedial training tools commonly known
as computer-assisted instruction (CAI). In computer assisted
instruction (CAI), courseware is provided for teaching
presentations in various learning areas. Unlike my prior
5   invention, in computer assisted instruction (CAI), the
subjective factors of reliability, validity, bias, and
standardization are seldom of central importance because of
the objective teaching nature of the CAI courseware.

In contrast, my patent discloses that these subjective
10 factors are of primary importance in the psychological and
educational assessment tools, and that accurate determination
of the tested subject's basals and ceilings is required for
the proper administration and scoring of the psychological
assessment test, which is used in education. My patent also
15 points out that video and audio presentations are mainly
matters of variable style or perceived effectiveness in the
computer assisted instruction (CAI) environment.

Further in contrast, with respect to psychological
assessment, assessment tools are rigorously field tested
20 (i.e. "normed") for reliability and validity, and their mode
of administration is precisely stipulated, and any deviation
may violate the conditions under which it had been normed.

My patent points out that psychological and educational
assessment tools can utilize the full range of multi-media
25 presentation features which closely simulates the manual
version of a normed test. In my patented application of
multimedia technology, the standards used to create the
manual test are easily translated to the computer test by a
comparative study of the similarity of test scores of
30 computer assisted versus manual testing.

My patent also emphasizes that Computer Assisted
Instruction (CAI) is used to teach new material, to review
learned material as in drill and practice, to teach
productivity techniques such as word processing and to teach
35 programming, and to keep track of scores or to adjust the
level of difficulty.

In contrast, the Computer Assisted Assessment (CAA) of

my invention is an assessment tool, so that teaching is not the objective. Scoring of Computer Assisted Assessment (CAA) is sophisticated with raw scores, standard scores, sub-tests, age equivalents, and basals and ceilings. The testing rules

5 of Computer Assisted Assessment (CAA) are rigid with no deviation allowed.

My prior patent emphasizes that a clinical psychological tester can use the Computer Assisted Assessment (CAA) with its attendant multimedia tools, in the area of question

10 sequencing and scoring related to establishing the critical range of the tested subject, and that the subject's basals and ceilings are determined by runs of right or wrong answers within a particular sequence. My patent also discusses a method for reducing bias, such as social class prejudice or

15 the assumption that shy or disruptive children are learning impaired.

My patent also overcomes that fact that some clinicians may be very proficient in their respective fields, but that they may not speak clearly, which causes confusion. My

20 patent reduces the probability that a tested subject will get a question wrong just because he or she doesn't understand the examiner, especially in English as a Second Language (ESL) subjects.

My patent also overcomes the limitations of standard

25 Computer software for test scoring and analysis of error patterns, which is available for manually administered tests. But these computer-assisted tests are not constantly re-evaluated, and the computer provides no computer guidance in administrating the test, since this is done as an ad-hoc

30 procedure after the test is over.

In the "Summary of the Invention" portion of my patent, there is described a method and system to perform psychological and educational assessment of subjects using multi-media technology.

35 The method described in my patent is for psychological and educational evaluation of human subjects, which includes the steps of providing a human subject, such as a student, to

be evaluated, with a multi-media capable computer having a
view monitor means, such as a VDT terminal, and a computer
input-response means, such as a keyboard, a mouse or a touch
screen. In that patent, it is noted that a human

5   psychological tester optionally operates the multi-media
computer and conducts the psychological evaluation of the
student.

My patent also discusses the option that the multi-media
computer has a linguistic adaptation means, such as a sound

10 card and data associated therewith, which can produce sounds,
such as test instructions, in the most appropriate language
and dialect of the test taker, such as a student, so that the
human tester can provide the human subject with instructions
for responding to the psychological evaluation.

15   As for multi-media technology, my patent discusses that
a human subject being psychologically evaluated is exposed to
computer-generated multi-media psychological evaluative
probing, so that the human subject can respond to the
computer-generated psychological evaluative probing.

20   This feature is reiterated in my new patent application
for my present invention in the field of psychological
evaluation of subjects during psychological vocational
assessment. In both my patent and the present invention
herein, the computer tallies and records the subject's

25 responses and analyzes the human subject's recorded
responses. Afterward the computer automatically prepares a
report based upon the human subject's recorded responses, and
transfers its report, such as by transfer to a computer-
readable diskette or by printing to a printer.

30 In both my earlier patent and in my present invention for
vocational assessment, the psychological evaluation of the
human subject is provided by at least one software program
stored in a randomly accessible non-volatile computer memory,
such as the computer's hard drive, for providing at least one

35 type of psychological evaluation. The at least one software
program further includes a plurality of discrete audible
and/or visual segments such as questions to be responded to

by the human subject being evaluated.

The discrete audible segments include audibly reproducible signals stored in a randomly accessible non-volatile computer memory for producing sounds to be responded 5 to by the human subject being evaluated, such as spoken phrases to be responded to by the human subject. The spoken phrases are selected from a plurality of user-selectable languages and/or dialects.

The discrete visual segments include visually- 10 reproducible signals stored in a randomly accessible non-volatile computer memory for producing images to be responded to by the human subject being evaluated, such as text selected from a plurality of psychological evaluation question items stored as text written in a plurality of 15 languages and/or dialects and/or character sets, such as Chinese or Cyrillic, among others.

My patent also discusses the fact that to assist in evaluating temporal time oriented tasks, such as allowing a person decide which of a plurality of moving objects, such as 20 balls, moves fastest, or the calculated destination thereof, optionally the discrete visual segments may include computer-generated motion for psycho-motor evaluation of human subjects.

My patent discusses that computer-generated motion may 25 include a plurality of user selectable visually perceived motions, such as the moving balls, at differing speeds and/or velocities and/or accelerations.

Moreover, my patent also discusses that the software program can present audible psychological probing tasks in a 30 variety of user-selected languages and dialects, wherein the languages and dialects are respectively stored discretely in randomly accessible computer non-volatile memory, such as the computer's hard drive or upon a removable diskette.

In both my patent and in my present invention for vocational 35 assessment, the method of using multi-media technology in psychological evaluations may include an evaluation of the human subject's emotional status, mental health, learning

ability, neurological impairment status, educational status, educational achievement status, aptitude for future education or aptitude for future vocational education.

5   In the "Brief Description of the Drawings" portion of my patent, there was disclosed multi-media equipment which is used in a test session for psychological evaluation.

My patent disclosed typical video display screen's views of various multi-picture panels used in the computer assisted psychological assessment.

10   My drawings also disclosed video displays using screen panels, optional animation and voice response modes.

The drawings of my patent also show a video display screen sequence of the multi-media system with clarifying instructions and "Dynamic Linguistic Adaptation" portions.

15   My patent also shows various exemplary video display screens that illustrate modeling proper response sequences for sample questions.

My patent also provides for an input response means 23 which is used to input communicated sensory data from the

20   human subject to multi-media computer to conduct a psychological evaluation of the human subject.

My patent also discloses how a computer-responsive user selectable means, such as a keyboard, allows a psychological tester to select pre-recorded test instructions in

25   appropriate languages and dialects appropriate to the language and dialect of human subject being tested.

My patent also uses the multi-media tool of an audible playback which audibly communicates one or more sets of pre-recorded test instructions, with audible playbacks having

30   sound cards and data associated therewith, to produce audible test instruction sounds, in the appropriate language and dialect thereof.

My patent also discloses a multi-media software program that includes a plurality of discrete audible and/or visual

35   segments such as questions to be responded to by the human subject being evaluated. In my patent, a user-selectable set of computer-generated multi-media psychological evaluative

probing data communicates with the audible playback, and a
recorder records responses of the human subject in response
to the computer-generated psychological evaluative probing.
The human subject's responses are tallied.

5   In my patent, a computer output printer automatically
prepares a written record of the human subject's recorded
responses in a written report, which report is transferred to
a computer, and is stored in the randomly accessible non-
volatile computer memory of the multi-media computer.

10   My patent also shows a psychological assessment session,
using a multi-media system to give the same type of test as
is done in conventional human-to-human evaluations. My
patent discloses how a tested human subject sits facing a
computer screen on a video display terminal of a multi-media

15 personal computer, wherein the subject uses pointing device
to indicate his or her answers.

       My patent also discusses various multi-media computer
components, such as a mother board containing a
microprocessor and other modules and support electronics,

20 with optional extra random access memory (RAM), a hard drive,
a floppy drive using removable media (diskettes), a CD-ROM
with a removable compact disk (CD), a sound board and a
variety of sockets or ports to support a speaker, a
microphone, a display, a mouse port and a keyboard socket.

25   My patent gives a non-limiting example of an appropriate
multi-media computer, such as a Packard Bell model AX3510,
which has 8 MB RAM, a 1000MB hard drive, Quad speed CD-ROM,
stereo speakers and an Intel 100 MHZ Pentium processor.

       My patent explains that Computer Assisted Assessment

30 tools may run on a 33 MHZ '386 class processor with a 100MB
hard drive, single speed CD-ROM and 4 MB of RAM, or a
notebook computer having similar capability with integral
liquid crystal display (LCD).

       My patent discloses that any type of pointing device can

35 be used; such as, for example, a mouse, track ball, video
game control, joy stick, or even a finger when used with a
"touch screen", as well as other display technologies such as

plasma displays or Texas Instrument's micro-mirrors, which can support 3-D presentation displays, which are most appropriate in psychological assessment tests.

My patent shows that educational and psychological
5   assessment test content is prepared using state-of-the-art multi-media authoring tools combining audio, picture and text sources, which improves over the manual administration of these psychological assessment tools, so that the automatic nature of using a computer precludes bias in test
10 administration.

My patent reiterates that computer administration enhances on-task performance of the person being tested, in a non-biased fashion, so that test standardization is assured by computer administration.
15   My patent shows that multi-media technology can selectively first show an image with a plurality of objects, and then can eliminate a number of the presented objects to focus the tested subject on an appropriate response.

My patent also shows that animation can be used in
20 creating new measures dealing with temporal issues, such as movement of objects, which is also appropriate in my present invention which, among other features, can virtually simulate a vocational environment of a job candidate. My present invention also shows that animation can also test cognitive
25 skills in predicting events related to the virtual work environment. In my present invention, a multi-media computer is ideally suited for assessment tools that require the use of timing, to replace assessment evaluations requiring the use of a stopwatch by the clinician to either time the
30 presentation of materials or the period for timed responses (or both).

My patent also shows that a multi-media computer may have voice recognition software of proper quality that it can reliably recognize the utterances of a tested subject and
35 that a microphone can be used to field the responses and determine if an answer is right or wrong, or if more than one response has been given.

Such state-of-the-art of voice recognition software is disclosed in software of Syracuse Language Centers, which run on a 386-class computer with 4MB of RAM and are capable of analyzing the pronunciation of words automatically.

5   My patent also discloses that different keys on a keyboard or pointer can also be linked to specific verbal responses or prompts. For example, if the test subject gives an ambiguous answer, the computer can audibly say, "Explain what you mean." In the present invention, the computer can

10   evaluate stressful assessment situations, by uttering critical statements, such as, "You're not working fast enough," and then can use biofeedback monitoring to evaluate the subject under stress.

My patent discusses the use of appropriate language

15   dialects, as well as an "assisted voice recognition" system which uses a keyboard and no microphone. In this system, keys on the keyboard are mapped onto special functions by the testing software, wherein responses of a tested subject may be responded to with an audio feedback such as, "Please

20   respond with only one answer" every time one of the "Invalid" keys is pushed.

My patent also discusses how incorrect answers can be responded to if answered incorrectly. The test can be automatically terminated if the test subject never gets

25   beyond an initial stage. After the test, a raw score is updated, the basal/ceiling analysis is performed, the test score is updated, the sequence is changed if necessary, and the subsequent following question is presented (or the test is ended). This general flow can be used with pointing as

30   well as verbal answers. It is understood that other logical flows can be used to achieve an equivalent result without deviating from the scope of this invention.

My patent also demonstrates various video display screens displaying multi-media techniques in modeling

35   appropriate responses for sample questions. The drawing Figures show screens with pictures of objects wherein the tested subject is asked to point to one of the objects and if

the answer is incorrect, the respective display screen shows
the image corresponding to the correct answer. By not
showing the other two images in the same screen in the
present invention, the student's attention is focused on the
5   correct answer.

My patent also shows a typical example known as a CREVT-
CA program, which shows how the method and system of the
present invention is used in one illustrative example. In
this example, a sample psychological/educational assessment
10 test is run in a computer program designated as the
"Comprehensive Responsive and Expressive Vocabulary Test-
Computer Administered" (CREVT-CA).

To start the CREVT-CA program, the user double clicks on
the CREVT-CA icon in the CREVT-CA Program Group. If the user
15 has installed the program in WINDOWS 95®, from the start
menu, the user selects "Programs, CREVT Program Group", with
the CREVT-CA icon. After the opening title, the Main Menu
appears. Six choices on this screen are available to the
user, such as:
20   (OK) Administer Tests
        (OK) Score Expressive Subtest
        (OK) View a Previous Record
        (OK) Change the Password
        (OK) Recharging Information
25   (OK) Exit

To choose an option, the user points and clicks on the
box next to the operation the user wishes to bring forth.

My patent also shows how a typical program, such as a
CREVT-CA is used to administer a test to an individual.
30   In the CREVT-CA example, the user can choose to
administer both the Receptive and Expressive sub-tests or
individual sub-tests.

Then, user the completes the demographic information
screen.
35   The user selects an appropriate language and dialect of
the test subject, such as a child, such as "French-Quebecois"
vs. "French-Haitian Creole", or "English-Australian" vs.

"English-Southern American" and the like. When this is done, the user clicks on the "OK" button to continue.

Finally, the user chooses which form of the test the user would like to administer - Form A or Form B. If the

5   user is administering both sub-tests, the form selection applies to both sub-tests.

Whether the user has chosen to administer the Receptive Vocabulary Subtest, or both Sub-tests, the testing begins with the Receptive subtest. The subject is seated in front

10   of the computer with the mouse in hand (in other test environments, the examiner may input information from the subject, who is tested in a hands-free environment). During the Receptive portion of the test, a voice in a pre-selected language and dialect pronounces a word while the subject

15   views the pictures. In this example, the subject simply uses a pointer, such as a computer mouse to point and click on a picture to indicate an answer.

As soon as a ceiling is reached (when the subject misses two consecutive items in the set of items) the program

20   automatically moves on to the next set of pictures.

If the user is using the CREVT-CA program to administer the Receptive portion of the test but is administering the Expressive portion without the computer's assistance, the user can still have the CREVT-CA compute the standard scores,

25   percentiles, and age equivalents for both sub-tests together. When the Expressive and Receptive sub-tests are completed, and after the user has finished the Receptive test on the computer, the user simply clicks on the "yes" button to choose to score the Expressive subtest as well. The CREVT-CA

30   program asks the user to enter the raw score of the Expressive subtest and then computes the Receptive, Expressive, and Composite scores.

After the Receptive subtest is completed, the user needs to enter the user's password to be able to view the scores

35   (the password is initially set to "CREVT"). First, the screen displays a graph of the percentage of correct answers per set of pictures. This graph can be printed by clicking

on the "OK" button next to the word "Print" at the bottom of
the screen. To continue on and to view the subject's scores,
the user clicks on the "OK" button next to the words
"Continue" and "View Test Scores".

5   The Expressive portion of the test is given on the
computer after the Receptive portion or by itself. The
computer gives the instructions orally and asks the subject
to define a series of words.

         The Expressive Subtest automatically ends when either a
10   ceiling is reached (i.e., when the subject misses three
consecutive items) or when the last (25th) item is
administered.

         According to my patent, when the testing is finished for
a particular subject, the examiner enters a password (the
15   password is initially set to "CREVT") to view a comprehensive
report of the test results on the computer screen. The
examiner can then print out a hard copy of the report by
clicking on the "PRINT" button at the bottom of the scores
screen. If the Expressive subtest was administered and some
20   information was saved in the "SUBJECT'S REPLY" text boxes,
the examiner has the option of also printing out those
replies.

         The CREVT-CA program also allows the user to graph the
standard scores obtained by the subject, along with up to
25   seven standard scores with means of 100 and standard
deviations of 15 obtained when using other tests with the
subject. To print, the user clicks on the "OK" button next
to the work "PRINT" on the bottom of screen displaying the
graph.

30   To view the scores of a subject who took the test
previously, the user chooses to view a previous record option
from the Main Menu. The user enters the name of the subject
whose record the user wants to see. The user can search for
a record by last name only or by first and last names. The
35   user can also choose to view the database record by record.
Once the desired record is displayed on the screen, the user
can choose to view either the subject's scores or the

subject's responses to the Expressive Vocabulary subtest.
The user can also print out hard copies of either of these
items.

In my present invention, it is noted that many of the
5   aforesaid multi-media applications can be specifically used
in the field of vocational psychological assessment, to
ascertain whether a tested subject is suitably fitted for a
particular job. Not only can the person's cognitive aptitude
be determined, but the tested person can be monitored while
10   subjected to non-stressful and stressful situations, to
simulate the rigors of a particular job or the person's
suitability in general for a particular job.

BACKGROUND OF THE INVENTION

Various attempts have been made to use computers in
15   vocational assessment. For example, US Patent No. 5,326,270
of Ostby discloses use of a computer for pre-employment
screening, but it is more of a role playing game that is also
applicable to training. The emphasis on "path analysis" in
assessing task-processing style has no counterpart in the
20   present invention.

US Patent No. 4,627,818 of Von Fellenberg discloses a
very exacting method for presentation of paired questions and
analysis of their results for identifying subject's
psychological traits.

25   US Patent No. 4,683,891 of Cornellier discloses a
computerized employment training using biofeedback monitoring
to enable a subject to increase his tolerance of stress and
enable him to perform tasks under more stressful conditions,
using goal oriented cognitive tasks.

30   US Patent No. 5,551,880 of Bonnstetter discloses an
Employee Success Prediction System, using a computer to
administer testing, but appears not to use graphics or multi-
media. The testing in Bonnstetter '880 uses questionnaires.
Both behavioral and value profiles of a subject are obtained.

35   In addition, it has been found previously in the prior
art, primarily from testing for integrity on polygraph tests,
that questions that take longer to answer and that exhibit

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more response time latency variability are not being answered truthfully.

However, these prior art patents and polygraph integrity testing do not disclose a multi-media method and system which 5 performs psychological assessment of an individual for suitability for particular jobs, whereby the individual is shown and provided with discrete visual and auditory stimuli on a multi-media computer screen, so that the individual's responses can be monitored in conjunction with physiological 10 responses received by biofeedback sensors.

These prior art patents and integrity testing also do not disclose display of virtual work environments, to enable the tested individual to simulate a real work environment, so that a job candidate's ability to maintain task focus under 15 pressure can be measured, rather than only inferring potential performance based upon selective input from a job candidate.

The above references to and descriptions of prior proposals or products are not intended to be, and are not to 20 be construed as, statements or admissions of common general knowledge in the art in Australia.

OBJECTS OF THE INVENTION

It is therefore desirable that the present invention provides a computer administered modular multi-media normed 25 personnel evaluation and vocational assessment system.

It is also desirable to be able to evaluate test performance, interpretation and scoring criteria which evolves over time to reflect changes in the population subjected to the various test modules to establish norms more 30 representative of the current population.

It is further desirable to provide multi-media software and tangible technology which is delivered as portable media, such as CD-ROM, diskette, DVD, computer compatible input media, or software which is downloaded and administered from 35 the Internet.

It is also desirable to provide for pre-employment screening, on the job promotion/retention/length of

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development screening and pre and post training evaluations which contain job performance modules as well as aptitude subtest modules.

5   It is also desirable to provide a menu derived from subject population statistics for particular job titles, which is presented for reflecting the suitability of various test modules, the suggested weight for each module and the pass/fail limits of each module compared to subject population statistics.

10   It is also desirable to provide a vocational assessment tool wherein the test administrator can modify the module selection, the pass/fail limits, and the weights assigned to each module for a particular job title or for a particular individual, in a variety of job performance modules.

15   It is also desirable to provide a computer administered multi-media stress tolerance test that compares a subject's performance on a visual matching task under two conditions, non-stress and stress, by using test shapes which are selected to minimize ethnic bias and cultural differences.

20   It is further desirable to provide a multi-media vocational assessment system which utilizes physiological sensors to actually measure and quantify changes in the autonomic nervous system of the person being tested, thereby detecting the onset of such changes and the degree of such
25   changes during the stress test.

It is also desirable to provide a vocational system which can test a subject's reaction to psychologically induced stress, with that induced by physical means, such as by a standard treadmill test sequence.

30   It is also desirable to provide a multi-media vocational assessment, whereby images are revealed progressively, wherein the subject identifies emerging pictures and the required by the subject to make his or her identification is evaluated.

35   It is yet further desirable to provide a computer administered integrity test module wherein questions are dispersed and repeated throughout a test, to detect deceptive

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answers.

It is also desirable to provide a computer-generated vocational assessment test which uses virtual reality images
5 and sounds to simulate various vocational work environments, to ascertain the best placement of a potential worker.

It is therefore also desirable to provide a computer-generated vocational assessment system which uses virtual reality images to selectively reject persons who have
10 vestibular or motor coordination problems not suited for the work environment being simulated.

It is also desirable that the present invention improves over the disadvantages of the prior art.

SUMMARY OF THE INVENTION

15 According to a first aspect, the present invention provides a personnel evaluation system comprising: at least one multimedia computer for transceiving audio and visual stimuli for a subject; a storage memory of said system for storing application modules; at least one central processing
20 unit within said multimedia computer to administer said application modules to said subject, perform analysis of input data, and cause said multimedia computer to transmit said stimuli; said application modules comprising at least one software application for utilizing multimedia technology
25 to assess in a clinically valid manner respective skills and abilities of the subject which cannot be assessed by non-multimedia test content, said skills and abilities applicable to work-related tasks; a software application in which stimuli are presented to a subject, the subject responding to
30 the stimuli as best as he or she can, to determine the precise ability level of the subject being evaluated, and wherein said storage memory of said system includes a scoring system derived from database statistics calculated for a representative sample of a specific population of subjects
35 being tested and a predetermined pass/fail threshold for each said application module based on updated database statistics reflecting past test results of prior subjects in a similar job role or in a role requiring similar skills or abilities.

16A

According to a second aspect, the present invention
provides a personnel evaluation system comprising: a
multimedia computer for transceiving audio and visual stimuli

5   for a subject; a storage memory of said system for storing
application modules utilizing multimedia technology to assess
skills and abilities in a manner which cannot be assessed by
non-multimedia content or utilizing multimedia technology to
measure skills or abilities applicable to work-related tasks

10   in a manner which is more clinically valid than the manner in
which such skills or abilities must be measured when using
only non-multimedia, text-based content; a central processing
unit within said multimedia computer to administer said
application modules to said subject, perform analysis of

15   input data, and cause said multimedia computer to transmit
said stimuli; said application modules comprising a software
application to complete at least one of the following tasks:
to store and evaluate all input data, simulate work-related
tasks, deliver stress-inducing audio or visual stimuli to

20   said subject, said stress-inducing audio or visual stimuli
being race, gender, ethnic, and cultural neutral, to interact
with said subject, and assess at least one of the
intelligence, interest, values, emotional status, mental
health, neurological impairment, education, social skills,

25   aptitude, processing speed, performance efficiency, task
focus, distractability resistance, stress-tolerance,
communication skills, knowledge, reasoning ability, logic
skills, job skills, vocabulary, emotional quotient (EQ),
impulsivity, risk-tolerance level, personality and specific

30   approach to problem solving; a software application in which
stimuli are presented to a subject, the subject responding to
the stimuli as best as he or she can, to determine the
precise ability level of the subject being evaluated, the

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identification made by the subject being evaluate; wherein said storage memory of said system includes a scoring system derived from database statistics calculated for a particular

5   job title, incorporating a suggested default list of application modules to be administered for a specific job title, a suggested weight and signification applied to each said application module score in an overran suitability to job title score, and a predetermined pass/fail threshold for

10   each said application module based on updated database statistics reflecting past test results of prior subjects in a similar job role; wherein said system incorporates the ability to compare a subject's performance on a task under non-stressful and stressful conditions to determine a

15   subject's stress tolerance level; wherein said stressful conditions incorporates multimedia stressors using one or more of the following: stressful music, stressful audio, negative feedback, and restricted time deadlines for task completion; wherein said system incorporates error pattern

20   analysis so as to determine not just the degree to which a subject is affected by stress, but in what manner the subject tends to become affected and in what manner his performance is most likely to change when placed in a stressful environment; and wherein said system incorporates the ability

25   to automatically stop administration of remaining application modules of said application modules, in the event that the subject's performance is below a predetermined pass/fail threshold for any particular application module of said application modules.

30   According to a third aspect, the present invention provides a personnel evaluation system comprising: at least one multimedia computer for transceiving audio and visual stimuli for a subject from at least one of a hard drive of said computer, or the Internet, or a company intranet, or

35   combination thereof; a storage memory of said system for storing application modules; at least one central processing unit within said at least one multimedia computer to

16C

administer said application modules to said subject; perform
analysis of input data, and cause said multimedia computer to
transmit said stimuli; said application modules comprising at
5   least one software application to complete at least one of
the following tasks: to store and evaluate all input data,
simulate work-related tasks, deliver stress-inducing audio or
visual stimuli to said subject, said stress-inducing audio or
visual stimuli being race, gender, ethnic, and cultural
10   neutral, to interact with said subject, and assess at least
one of the intelligence, interest, values, emotional status,
mental health, neurological impairment, education, social
skills, aptitude, processing speed, performance efficiency,
task focus, distractability resistance, stress-tolerance,
15   communication skills, knowledge, reasoning ability, logic
skills, job skills, vocabulary, emotional quotient (EQ),
impulsivity, risk-tolerance level, personality and specific
approach to problem solving; a software application in which
stimuli are presented to a subject, the subject responding to
20   the stimuli as best as he or she can, to determine the
precise ability level of the subject being evaluated, the
identification made by the subject being evaluated; wherein
said storage memory of said system includes a scoring system
derived from database statistics calculated for a particular
25   job title, incorporating a suggested default list of
application modules to be administered for a specific job
title, a suggested weight and signification applied to each
said application module score in an overall suitability to
job title score, and a predetermined pass/fail threshold for
30   each said application module based on updated database
statistics reflecting past test results of prior subjects in
a particular job role or similar job role; and wherein when a
scoring ceiling or basal threshold is reached when the
subject misses a predetermined number of a consecutive
35   correct answers or answers a predetermined number of
consecutive questions correctly in said tests, said system

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dynamically adapting by automatically moving on to easier or more difficult sets of questions being presented to the subject.

5   According to a fourth aspect, the present invention provides a personnel evaluation system comprising: at least one multimedia computer for transceiving audio and visual stimuli for a subject from at least one of a hard drive of said computer, or the Internet or a company intranet, or

10   combination thereof; a storage memory of said system for storing application modules; at least one central processing unit within said at least one multimedia computer to administer said application modules to said subject, perform analysis of input data, and cause said multimedia computer to

15   transmit said stimuli; said application modules comprising at least one software application for doing at least one of the following tasks: utilizing multimedia technology to assess skills and abilities in a clinically valid manner, or utilizing multimedia technology to assess skills or abilities

20   applicable to work-related tasks in a more effective manner than how those skills or abilities can be assessed by non-multimedia content or utilizing multimedia technology to compare the performance of a subject on a specific task with distractions present to the performance of the same subject

25   on the same or similar task without distraction present, in a more effective manner than can be assessed when utilizing non-multimedia content or utilizing multimedia technology to compare the performance of a subject on a specific task when under stressful conditions to the same subject's performance

30   on the same or a similar task when under less stressful or non-stressful conditions, in a more effective or real life manner than can be assessed by utilizing non-multimedia content or utilizing multimedia technology to assess the social skills of a subject using audio and facial expressions

35   or social interactions, in a more effective manner than can be assessed by utilizing non-multimedia content, or combinations thereof; a software application in which stimuli are presented to a subject, the subject responding to the

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stimuli as best as he or she can, to determine the precise
ability level of the subject being evaluated, the
identification made by the subject being evaluated; and
5   wherein said storage memory of said system includes a scoring
system derived from database statistics calculated for a
representative sample pf a specific population being tested
and a predetermined pass/fail threshold for each said
application module based on updated database statistics
10 reflecting past test results of prior subjects in a similar
job role.

According to a fifth aspect, the present invention
provides a personnel evaluation system comprising: at least
one multimedia computer for transceiving audio and visual
15 stimuli for a subject from at least one of a hard drive of
said computer, or the Internet or a company intranet, or
combination thereof; a storage memory of said system for
storing application modules; at least one central processing
unit within said multimedia computer to administer said
20 application modules to said subject, perform analysis of
input data, and cause said multimedia computer to transmit
said stimuli; said application modules comprising at least
one software application for doing at least one of the
following tasks: utilizing multimedia technology to assess
25 skills and abilities in a clinically valid manner or
utilizing multimedia technology to assess skills or abilities
applicable to work-related tasks in a more effective manner
than how those skills or abilities can be assessed by non-
multimedia content or utilizing multimedia technology to
30 compare the performance of a subject on a specific task with
distractions present to the performance of the same subject
on the same or similar task without distraction present, in a
more effective manner than can be assessed when utilizing
non-multimedia content or utilizing multimedia technology to
35 compare the performance of a subject on a specific task when
under stressful conditions to the same subject's performance

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on the same or a similar task when under less stressful or
non-stressful conditions, in a more effective or real life
manner than can be assessed by utilizing non-multimedia

5   content or utilizing multimedia technology to assess the
social skills of a subject using audio and facial expressions
or social interactions, in a more effective manner than can
be assessed by utilizing non-multimedia content, or
combinations thereof; a software application in which stimuli

10   are presented to a subject, the subject responding to the
stimuli as best as he or she can, to determine the precise
ability level of the subject being evaluated, the
identification made by the subject being evaluated; wherein
said storage memory of said system includes a scoring system

15   derived from database statistics calculated for a particular
job title, incorporating a suggested default list of
application modules to be administered for a specific job
title, a suggested weight and signification applied to each
said application module score in an overall suitability to

20   job title score, and a predetermined pass/fail threshold for
each said application module based on continually updated
database statistics reflecting past test results of prior
subjects in a particular job role or similar job role; and
wherein when a scoring ceiling or basal threshold is reached

25   when the subject misses a predetermined number of a
consecutive correct answers or answers a predetermined number
of consecutive questions correctly in said tests, said system
dynamically adapting by automatically moving on to easier or
more difficult sets of questions being presented to the

30   subject.

     According to a sixth aspect, the present invention
provides a personnel evaluation system comprising: at least
one multimedia computer for transceiving audio and visual
stimuli for a subject from at least one of a hard drive of

35   said computer, or the Internet or a company intranet, or
combination thereof; a storage memory of said system for

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storing application modules; at least one central processing
unit within said multimedia computer to administer said
application modules to said subject, perform analysis of
5   input data, and cause said multimedia computer to transmit
said stimuli; said application modules comprising at least
one software application for doing at least one of the
following tasks: utilizing multimedia technology to assess
skills and abilities in a clinically valid manner or
10   utilizing multimedia technology to assess skills or abilities
applicable to work-related tasks in a more effective manner
than how those skills or abilities can be assessed by non-
multimedia content or utilizing multimedia technology to
compare the performance of a subject on a specific task with
15   distractions present to the performance of the same subject
on the same or similar task without distraction present, in a
more effective manner than can be assessed when utilizing
non-multimedia content or utilizing multimedia technology to
compare the performance of a subject on a specific task when
20   under stressful conditions to the same subject's performance
on the same or a similar task when under less stressful or
non-stressful conditions, in a more effective or real life
manner than can be assessed by utilizing non-multimedia
content or utilizing multimedia technology to assess the
25   social skills of a subject using audio and facial expressions
or social interactions, in a more effective manner than can
be assessed by utilizing non-multimedia content, or
combinations thereof; a software application in which stimuli
are presented to a subject, the subject responding to the
30   stimuli as best as he or she can, to determine the precise
ability level of the subject being evaluated, the
identification made by the subject being evaluated; wherein
said storage memory of said system includes a scoring system
derived from database statistics calculated for a particular
35   job title, incorporating a suggested default list of
application modules to be administered for a specific job
title, a suggested

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weight and signification applied to each said application
module score in an overran suitability to job title score,
and a predetermined pass/fail threshold for each said
5   application module based on updated database statistics
reflecting past test results of prior subjects in a similar
job role; wherein said system incorporates the ability to
compare a subject's performance on a task under non-stressful
and stressful conditions to determine a subject's stress
10   tolerance level; wherein said stressful conditions
incorporates multimedia stressors using one or more of the
following: stressful music, stressful audio, negative
feedback, and restricted time deadlines for task completion;
wherein said system incorporates error pattern analysis so as
15   to determine not just the degree to which a subject is
affected by stress, but in what manner the subject tends to
become affected and in what manner his performance is most
likely to change when placed in a stressful environment; and
wherein said system incorporates the ability to automatically
20   stop administration of remaining application modules of said
application modules, in the event that the subject's
performance is below a predetermined pass/fail threshold for
any particular application module of said application
modules.

25   In keeping with these desirable attributes and others
which may become apparent, the present invention provides a
battery of tests which are administered to an individual by a
computer using multi-media features. This normed testing can
be used to assess the suitability of an applicant for
30   employment, although other versions of the test emphasizing
the stress tolerance module can also be used for screening
candidates for high-stress or high-risk mission critical
assignments. The primary objective of this invention is to
reliably and accurately predict real world success using an
35   easily administered rapid assessment technique.

        As the performance and scoring of these normed tests
evolve over time, an important feature of this assessment

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system is to maintain a database of field experience to continually refine the norms to insure that they are representative of the current population of individuals
5   subjected to these tests. Updates of these norms are distributed to customers. The actual software product is delivered to customers as portable media such as CD-ROM, diskettes, DVD or similar computer input media. It is also available for download to a test administrator in secure
10 fashion from an Internet web site. Direct use from a web site on the Internet or on a company intranet is another option for test delivery.

       For example, the multi-media software may have an interface utilizing one or more computer input hardware
15 devices such as a mouse, a keyboard, a touch pad, a microphone, a camera, physiological sensors or any other

computer input device. The software is delivered to a test
administrator as portable media such as CD-ROM, diskette,
ROM, non-volatile RAM, flash media, DVD or other computer
compatible input media.

5   The software may be also be downloaded from the
Internet, where access is obtained through the Internet. The
tests may be administered through the Internet and the
related administrative functions may be performed through the
Internet. When the Internet is used, there may be secured

10   communication, wherein the secured communication is
implemented with one or more security technologies, such as
an internet protocol security, a secure socket layer, a
private key encryption and/or a public key encryption or may
utilize a VPN or other form of secure tunneling technology.

15   Moreover, the present invention includes a personnel
evaluation system with one or more multimedia computers for
sending and receiving audio and visual stimuli, each
connected to respective central processing units to
administer a pre-employment evaluation, a pre-promotion

20   evaluation, a pre or post training evaluation, a personnel
development/leadership training evaluation, or other form of
employment evaluation application evaluation and to perform
an analysis of input data. The software application stores
and evaluates all input data and includes one or more modules

25   to monitor and re-scale non-truthful responses of prospective
employees, wherein one or more interfaces constantly monitor
a physiological state of a subject. These interfaces induce
stress inducing audio and visual stimuli and administer the
evaluations with race, gender, ethnic, and cultural neutral

30   stimuli. Optionally the interface may interact with the
subject in their native language, and dialect. The interface
assesses various aspects of the subject which might affect
work performance, such as intelligence, interest, values,
emotional status, mental health, neurological impairment,

35   education, social apperception and aptitude of the subject
being tested. The system can detect for untruthful responses
and re-scale values of questions depending on the type of

test and detect physiological changes in the subject. These
physiological factors which are monitored by biometric
sensors include measuring one or more of the following :
galvanic skin responses, muscle tone, facial expressions,
5   pupil dilation, heart rate, EKG electrocardiogram responses,
blood pressure, thoracic respiration, abdominal respiration,
saliva composition.

        One popular use for this invention is for pre-employment
screening. A menu derived from subject population statistics
10 is presented to the test administrator by the software which
displays the suitability of the various test modules, the
pass/fail limits, and the weight assigned to each module, all
with respect to a particular job title. The administrator
can modify these suggested parameters to tailor the screening
15 to his department needs. The job performance modules include
tests for Integrity, Aptitude, Loyalty, Stress Tolerance,
Memory, Social Awareness, Communications Skills, Performance
Efficiency, Distractibility, and Impulsivity. Aptitude sub-
tests include Visual Closure, Visual Analogies,
20 Categorization, Information, Personality, Interests, and
Values.

        The computer administered multi-media stress tolerance
test module compares a subject's performance on a visual
matching task under two conditions, non-stress and stress.
25 The visual matching task uses pictures of 3-D shapes and
objects that are carefully selected to avoid bias to
different ethnic groups or socio-economic status. Stress
factors used are audio coaching telling the user to hurry,
chiding the user for making errors, and short time limits for
30 test segments. For certain applications such as screening
candidates for critical missions, physiological sensors that
actually measure and quantify changes in the autonomic
nervous system are attached to the subject. These sensors
detect the onset and degree of such changes before, during
35 and after the stress test. Sensors on the subject's chest,
arm, and fingers measure heart rate, EKG electrocardiogram
responses, skin temperature, skin conductance, muscle

tension, respiration rate, facial expressions, eye pupil
dilation, galvanic skin responses, muscle tone, facial
expressions, thoracic respiration, abdominal respiration,
saliva composition and blood pressure and the changes and
5   degree of changes, in all of the above, before, during and
after the stress test. Additionally, digital recording of
facial expressions and pupil dilation are made. Thus, these
changes and the degree of change of these physiological
parameters are monitored during the entire test module
10 session. Combined with subject recovery time data, a very
comprehensive study of the reaction to physiologically
induced stress can be made in a clinical environment.
Examination of difference scores for correct matches, errors
of commission, and errors of omission provides a rapid and
15 precise indication as to the degree to which an individual is
affected by stress as well as the analysis of the likely type
of error an individual would make under stress.
        Several aptitude sub-tests using computer multi-media
techniques are used. Although they are similar to namesake
20 paper-and-pencil tests in objective, they are greatly
enhanced by the capability of the computer. Professional
voice actors are used to present audio instructions or test
questions thus eliminating variability due to communications
capabilities of "test givers".
25   For example, modules to test memory and distractibility
is very difficult to administer in a consistent fashion in
any other manner.
        All of the following combinations are administered:
visual memory, auditory memory, visual memory with visual
30 distraction, visual memory with auditory distraction,
auditory memory with visual distraction, and auditory memory
with auditory distraction. The subject's performance is also
measured on memory modules without distracters, to measure
the degree of subject distractibility and to measure the
35 specific modality of subject results, which compares
performance without and with distractions, to measure the
.degree and type of specific modality of distraction that the

subject finds most disturbing.

A computer administered multi-media visual analogies test module uses a combination of audio instruction with presentation of two 3-D color pictures of geometric shapes

5   related in some way followed by a third picture which is related in the same way to one of five choices presented.

The shapes are chosen to minimize bias to different ethnic groups or socio-economic status. A visual closure test is efficiently administered as a picture is revealed

10   progressively as it replaces random background elements.

The test is scored both by the accuracy with which the subject identifies the emerging picture as well as by the degree of completion (i.e. time) required by the subject to make the identification. A computer administered social

15   apperception test presents an array of high-resolution pictures of people in a variety of postures and facial expressions. The audio presents a spoken statement. The subject is to choose the picture of the person most likely to have made that statement using visual body language and

20   expression cues to pick up the subtle nuances of emotion depicted which reflect that of the spoken statement, as well as the nuances of expression and emotion involved.

A computer administered integrity test involves a set of written questions with multiple-choice answers. Subsets of

25   questions with related subject matter are dispersed throughout. The answers to the related questions are analyzed as to response time latency variability to detect attempted deception.

A computer-generated and administered vocational

30   assessment system uses virtual reality techniques to simulate a variety of vocational work environments or specific situations to ascertain the best placement of a potential employee. This is accomplished by generating specialized test modules or by substituting virtual reality images and

35   sounds within the format of the job performance and aptitude sub-tests described above.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention can best be understood in conjunction with the drawings of my aforementioned U.S. Patent No. 6,030,226, as well as the following drawings in
5   which:

Fig. 1 is a test module menu for a "driver" job title of the multi-media vocational assessment system of the present invention;

Fig. 2 is a screen image and audio for a Vocabulary test
10   thereof;

Fig. 3 is a screen image and audio for an Information test thereof;

Fig. 4 is a screen image and audio for a Categorization test thereof;

15   Fig. 5 is a screen image and audio for a Social Apperception test thereof;

Fig. 6 is a screen image and audio for an Auditory Memory test thereof.

Fig. 7 is a sample screen image and audio for an
20   Auditory Memory with a Visual Distraction test thereof.

Fig. 8 shows audio instructions for a Visual Memory test thereof;

Fig. 9 shows a screen image and an audio for a Visual Memory test thereof;

25   Fig. 10 shows a screen image and an audio for a Visual Closure test thereof;

Figs. 11A, 11B, 11C, 11D, 11E, 11F and 11G show various sample screen images for a Stress Tolerance Test thereof;

Fig. 12A displays audio for a Stress Tolerance test
30   thereof;

Fig. 12B displays a continuation of the audio for Stress Tolerance Test as in Fig. 12A;

Fig. 13A shows a performance results screen for a Stress Tolerance Test thereof;

35   Fig. 13B shows a biofeedback monitoring screen for a Stress Tolerance Test thereof;

Fig. 13C shows various relaxation phase screens

following a Stress Tolerance Test thereof;

    Fig. 14 shows a sample screen image from a sample of an
Integrity test thereof; and,

    Fig. 15 shows a screen image for a virtual reality

5 depiction of a work environment.

DETAILED DESCRIPTION OF THE INVENTION

    When used for pre-employment screening of individuals,
the testing system of this invention presents an initial menu
screen 1 to the test administrator as shown in Figure 1. The

10 name "SAVVY RECRUITER" indicates a trade name of Applicant.
Menu screen 1 is identified with a specific job title 2,
which is a "general manager" for this example. The job
attributes 3 are presented in a column format to the left and
their applicability to this specific job title 2 is presented

15 in "weight" 4 column to the immediate right. A job attribute
3 such as "Aptitude" is weighted as being more relevant than
"Memory" for the job title 2 of general manager.

    For a specific job attribute 3, such as "Aptitude", a
report may be generated by clicking on an option 5 for a

20 report and option 6 for display of relevant test weight. In
addition, scoring threshold 7 may be displayed to indicate
the desirability of the applicant for a particular position
such as job title 2. Time column 8 presents an estimate of
the time elapsed. The bottom right portion of menu screen 1

25 presents similar entries for Aptitude Sub-tests 9. The test
administrator can alter these recommended settings to tailor
the test evaluations for the company's specific requirements.

    Figure 2 shows an introductory sample screen for a
Vocabulary test. A professional voice actor speaks the

30 directions 13 printed below. The subject is prompted with an
auditory cue 14 such as "chair", upon which time he or she
should click on the chair 15 picture. If he or she realizes
that an error has been made, the repeat symbol 12 can be
clicked to get a second try. Continuing with the audio 14, a

35 sharpener 16 and a calculator 17 should be indicated.

    A similarly administered test, "Information," is shown
in the screen image of Figure 3, wherein Audio instructions

21 are presented. Then audio statements 22 are presented and
the tested subject is to indicate the image of the item which
answers the question such as eye 24, nose 23 or teeth 25.
Button 20 can be clicked to correct an answer.

5   Figure 4 shows a screen image of a Categorization test.
As per audio instructions 27, the objective is to select the
picture of the item which is not like the others. Audio
statements 28 would only be given during sample questions.
In this case, the picture of the lion 29 is the correct

10 answer.
         Figure 5 is a screen image of a sample question from a
Social Apperception test. Audio instructions 33 define the
objective as to "choose the person that goes with what you
heard". Button image 32 can be clicked to change an answer.

15 Sample statement 34 goes with image 35 since the statement
displays anger.
         Figure 6 shows a screen from an Auditory Memory test.
Audio directions 38 and examples 39 are strictly an
introduction. The actual test presents a stream of numbers

20 using audio. The subject has to enter the digits in the same
order by clicking on number symbols 40. He or she may click
cancel button 41 to try again, or signal OK 42 if he or she
feels his or her answer was the correct sequence.
         Figure 7 is a sample introductory screen from an

25 Auditory Memory with Visual Distractions. The audio
instructions, 45 and 46, explain the added visual "clutter"
43 consisting of 3-D images of spheres surrounding the
numeric display 40. The test begins as the sequences 47 are
read on the audio stream.

30   Visual Memory test audio directions 50 and 51 are shown
in Figure 8.
         The corresponding screen image is shown in Figure 9.
Shapes are presented in a sequence one at a time in frame 52.
The subject has to click on the shape images continuously

35 displayed in the same order and then click OK 56 when done.
The subject can change his answer once by first pressing
CANCEL 55. In the case shown, the image shown in frame 52 is

the same shape as item 53 below. Audio instructions 54
comment on the answer of the subject, and give instructions
for further proceedings.

Figure 10 is a screen image of a Visual Closure test.
5 Basic audio instruction 60 is presented for this sample.
Explanation 61 is also for illustration. The object image 63
emerges as more of random background 62 is converted to image
63 in a progressive fashion. When the subject recognizes the
picture as one of the four choices 64 presented, he or she
10 clicks on the matching image. This is a very smooth
operation, and the time to answer is accurately noted by the
computer.

Figures 11A, 11B, 11C, 11D, 11E, 11F and 11G show
various sample screen images for a Stress Tolerance Test
15 thereof. For example, Figure 11A shows a picture of an object
70, which is presented in a single panel on top. One or more
exactly matching images are in the set of nine image panels
below. In this example of Figure 11A, panels 71 and 72 match
the upper image exactly. The object is to find all matches
20 and click on them in a short period of time. Figures 11B,
11C, 11D, 11E, 11F and 11G show other configurations for
matching similar images together.

Figure 12A shows some introductory audio instructions.
No stress is provided yet. By the time of the last set of
25 audio instructions, stress inducing commands are introduced,
such as reducing the time factor in which to answer a
question, and the introduction of verbal chiding, compelling
the person being tested to work faster than has been
previously done, along with other optional stress-inducing
30 visual or auditory sound effects, such as flashing lights or
alarming music.

The audio of Figure 12B illustrates the stress
introduced by the auditory portion of the Stress Tolerance
Test.
35   Figure 13A shows a Performance Results screen
presentation 80 for the Stress Tolerance Test. For example,
Figure 13A represents the results of the Stress Module in

relation to the subject examinee 81 himself or herself and in relation to a general pool of examinees. The wide shaded bar 82 that extends across the entire graph is the measure of the average performance of the general pool of examinees. This

5   Stress Test Module uses sensory indicia to simulate a stressful working environment involving deadlines, accuracy, time urgencies, and negative feedback. The first bar 83 on the left designated as "Baseline Performance", together with the percentile and raw score below it, indicates the level of

10   the performance of subject examinee 81 when tested in a non-stressful environment, calm environment.

         The second bar 84, when the graph is viewed from left to right, designated as "Performance Under Stress", together with the percentile and raw score underneath it, indicates

15   the level of the performance of subject examinee 81 when tested under stressful conditions.

         The third bar 85, when the graph is viewed from left to right, designated as "Stress Tolerance Index", together with the percentile and raw score below it, indicates the level of

20   change in the performance of subject examinee 81 between testing with stressful conditions and with non-stressful baseline conditions.

         The first line of text 86 under the graph indicates the positive performance of the examinee in relation to his own

25   performance.

         The second line of text 87 under the graph indicates the pattern of error of subject examinee 81. This error pattern is analyzed and reported as either impulsive or inhibited and then is weighed as "slight", "moderate" or "significant".

30   Figure 13B shows a screen image of an example of the biofeedback monitoring used in conjunction with the Stress Tolerance Test. While Figure 13B shows that the data is manually inputted, it is known that alternatively the data may be automatically inputted from the sensors and recorded

35   automatically to the system.

         During this time, as shown in Figures 13C, 13D and 13E, a "slide show" relaxation phase of non-stressful scenes, such

as landscapes, is presented to the subject on the computer
screen.

Figure 14 shows a part of a sample sequence of questions
with multiple-choice answers from a sample Integrity test.
5   Some questions form related subject matter and these subsets
are dispersed. For example, questions 32 and 36 are part of
a Drug subset 95. Questions 35 and 40 are part of a Bribery
subset 97. ˙As noted above in the "Background of the
Invention" portion, it has been found previously in the prior
10 art, primarily from testing on polygraph tests, that
questions that take longer to answer and that exhibit more
response time latency variability are not being answered
truthfully. The Integrity test uses this general principle
in sophisticated algorithms comparing responses to similar
15 questions to flag false answers.

Fig. 15 shows a screen image for a virtual reality
depiction of a work environment. For example, Figure 15 is
one image of a virtual reality simulation of actual outdoor
working tasks of a land surveyor. In Figure 15, a personal
20 being assessed as a land surveyor views a simulated landscape
scene to be measured, as seen through lens 101 of a land
surveyor's transiting theodolite sighting telescope. The
person being assessed sees a virtual depiction of an actual
landscape scene, including man-made structures 102, such as
25 buildings, natural structures, such as trees and a horizon
104 in the distance. A typical road 105 is depicted in actual
perspective, so that the person being assessed can be
assessed doing virtual simulations of actual land surveyor's
tasks. Persons being assessed can be tested for their
30 endurance under challenging conditions. For example, for a
maritime surveyor, swaying of a seagoing boat can be provided
in virtual reality images.

OPERATION OF THE INVENTION

The present invention utilizes a Computer Optimized
35 Multimedia Intelligence Test (C.O.M.I.T.). The C.O.M.I.T. is
an individually administered multi-subtest battery based on
the Horn-Cattell model of fluid and crystallized

intelligence. It yields a comprehensive, valid and reliable
composite measure of general intelligence, as well as fluid
and crystallized IQ scores. In the Horn-Cattell model, fluid
intelligence refers to an individual's ability to devise and
5 apply problem-solving strategies when faced with novel or
unusual tasks. Fluid Intelligence reflects the individual's
ability to be flexible and apply age-appropriate concept
formation, analysis-synthesis and hypothetical-deductive
reasoning to solve unfamiliar problems. Fluid intelligence
10 is not heavily influenced by formal school experiences or
cultural settings.
        Crystallized intelligence, on the other hand, refers to
applying knowledge and skills acquired through formal, school
related learning experiences to a current problem. It is
15 heavily influenced by culture, and taps word knowledge,
verbal concept formation, categorizations and factual
knowledge.
        The C.O.M.I.T. is an appropriate measure of intelligence
for any applied or clinical sheeting requiring assessment of
20 intellectual abilities. The C.O.M.I.T. is flexible and
allows for everything from a quick screening to a
comprehensive assessment. The C.O.M.I.T. comes in many
languages. It has excellent reliability and validity, and
correlates significantly with existing measures of
25 intelligence. Since it is both administered and scored by
computer, human error and bias introduced by the examiner are
eliminated from the testing process.
        The C.O.M.I.T. test is computer administered, using
high-end graphics and professional voice actors. The
30 C.O.M.I.T. yields standard scores (scores with means equal to
100 and standard deviations of 15) for three scales:
Composite IQ, Fluid IQ and Crystallized IQ. This permits
direct comparisons with global scores earned on numerous
measures of achievement such as the Wechsler series of
35 intelligence tests.
        The C.O.M.I.T. has a total of 12 sub-tests each
producing standard scores (Mean=10; SD=3). Sub-tests that

measure fluid intelligence are: Visual Analogies, Visual
Closure, Visual Memory, and Auditory Memory. Sub-tests that
measure crystallized intelligence are: Vocabulary,
Information, and Categorization. The five supplemental
5   scales are: Processing Speed, Social Apperception, Auditory
Memory with Visual Distraction, Auditory Memory with Auditory
Distraction, and Visual Memory with Auditory Distraction.
        The selection of which sub-tests to administer during a
testing session can be completely controlled. The evaluator
10   has the following broad options:
        -    Administer a Screening Battery, consisting of 4
             reliable sub-tests and requiring 15-20 minutes to
             complete.
        -    Administer a more comprehensive Standard Battery
15   containing 7 sub-tests and requiring 25-30 minutes
             to complete.
        -    Administer a customized test battery by selecting
             any or all of the 12 sub-tests.
        The five supplemental sub-tests not included in either
20   the Standard or the Screening battery requires and additional
3-5 minutes each to administer. Testing may be discontinued
between sub-tests and continued at a later time.
        Composite, Fluid and Crystallized IQ scores are
presented in colorful graphic displays. Percentile scores
25   are also presented for these composite scores. Graphs
displaying performance on individual sub-tests show scaled
scores, as well as percentile scores for each sub-test so
that subject performance on each individual task can be
measured relative to the normative sample. In addition, a
30   special sub-test scatter score uses sophisticated algorithms
to calculate sub-test scatter and summarize the individual's
relative strengths and weaknesses compared to their own
ipsative mean and overall performance. Percentile scores for
sub-test performance are also displayed. All sub-test scores
35   (including supplemental sub-test scores) are presented in
colorful bar graphs that allow for clear visual comparisons
of performance. In addition, supplemental sub-tests

involving distraction yield a Distraction Index that
indicates the degree to which an individual's performance was
affected by distraction, as well as a visual depiction of
which distracting modality proved most troublesome for the
5   subject.

While other computer systems may be used, the preferable
minimum system requirements are:
-    IBM compatible PC
-    486 Processor (Pentium recommended)
10   -   8 megabytes of RAM (16 Meg or more recommended)
-    16 bit sound card
-    CD-ROM drive
-    16-bit Color VGA graphics

The present invention also uses a Stress Tolerance Rapid
15   Evaluation Software System (S.T.R.E.S.S.).

The ability to remain task focused under pressure is a
critical component of successful performance across a wide
spectrum of endeavors.

The Stress Tolerance Rapid Evaluation Software System
20   (STRESS) is specifically designed to help psychologists and
other professionals rapidly evaluate a subject's ability to
remain task focused under stressful conditions. It provides
a complete picture of the effects of stress on a subject's
ability to sustain attention, maintain attention to detail
25   and stay focused on task completion.

The STRESS test has wide applicability across diverse
areas of practice, ranging from clinical to applied settings.
It is unique and extremely precise because it directly
measures an individual's ability to stay task focused under
30   stress, rather than attempting to infer it from what an
individual is willing to reveal on a self-assessment
questionnaire. Some potential uses for the STRESS test
include:
-    Candidate screening for high-risk or high-stress
35   jobs
-    Suitability for duty or -re-deployment evaluations
     when the ability to remain task focused is at issue

       –   Stress research where standardized, object measures
            are required

       –   Stress management assessment and treatment
            evaluation

5   Most individuals can complete the STRESS test in
approximately 15 minutes. The test compares a subject's
performance on a visual matching task under two conditions:
Non-stress and stress. In each condition, subjects are
presented with up to 4 items. Each item consists of 3D
10 computer-generated shapes: A target shape and nine potential
matches. Subjects must identify all the shapes on the screen
that are identical to the target. Items occurring in the
same order during non-stress and stress conditions were
specifically designed to have identical difficulty-levels.
15 Care was taken to reduce ethnic bias and keep the shapes
culture-free. Conditions for producing stress were developed
in consultation with experts in the field and specifically
designed to induce autonomic nervous system arousal and a
sense of time urgency. Professional voice actors do all the
20 voice-overs.

      For non-stress and stress conditions the following data
are reported:

       –   The number of items completed during that condition
            (max=40)

25   –   The average amount of time required for completing
            each item

      Since non-stress and stress items are of identical
difficulty, comparisons are made between the items completed
during the stress condition and corresponding non-stress
30 items. These comparisons are:

       –   The total number of correct matches during each
            condition

       –   The total number of errors of omission or missed
            opportunities for matches

35   –   The total number of commission or incorrect matches
            during each condition

       –   The non-stress and stress difference scores for

correct matches, errors of omission and errors of commission

Examination of the difference-scores from the STRESS test provides a precise indication as to the degree to which
5   an individual is affected by stress, as well as an analysis of the subject's tendency to make errors of commission or errors of omission under pressure.

The STRESS test is administered and scored by computer thus eliminating human error introduced by variations in test
10 administration and scoring.

While other computer systems may be used, the preferable minimum system requirements are:

- IBM compatible PC
- 486 Processor (Pentium recommended)
15   - 8 megabytes of RAM (16 Meg or more recommended)
- 16 bit soundcard
- CD-ROM drive
- 16-bit Color VGA graphics

It is further noted that other modifications may be made
20 to the present invention, without departing from the scope of the invention, as noted in the appended Claims.

32

CLAIMS:

1. A personnel evaluation system comprising: at least one
multimedia computer for transceiving audio and visual stimuli
for a subject; a storage memory of said system for storing
5 application modules; at least one central processing unit
within said multimedia computer to administer said
application modules to said subject, perform analysis of
input data, and cause said multimedia computer to transmit
said stimuli; said application modules comprising at least
10 one software application for utilizing multimedia technology
to assess in a clinically valid manner respective skills and
abilities of the subject which cannot be assessed by non-
multimedia test content, said skills and abilities applicable
to work-related tasks; a software application in which
15 stimuli are presented to a subject, the subject responding to
the stimuli as best as he or she can, to determine the
precise ability level of the subject being evaluated; and
wherein said storage memory of said system includes a scoring
system derived from database statistics calculated for a
20 representative sample of a specific population of subjects
being tested and a predetermined pass/fail threshold for each
said application module based on updated database statistics
reflecting past test results of prior subjects in a similar
job role or in a role requiring similar skills or abilities.
25

2. The evaluation system of claim 1 in which a subject's
performance on a specific task is compared under non-
stressful and stressful conditions.

30 3. The evaluation system of claim 1 including a social
perception test in which pictures of people in a variety of
postures, facial expressions, and interactions are displayed
and an audio presentation of a spoken statement is made, said
subject identifying the picture of the person or people most
35 likely to have made that statement or most closely associated
with that statement.

33

4. The evaluation system of claim 1 in which said system moves on to easier sets of questions or more difficult sets of questions when the subject makes a predetermined number of incorrect answers or a predetermined number of correct
5   answers.

5. The evaluation system of claim 1 wherein said system records an answer of a subject to a particular question during a test, updates a test score and dynamically routes
10   subsequent questions in a logical flow to a subject depending upon the correctness or incorrectness of the subject's answer to said particular question, said dynamic routing progressing through said test to provide subsequent questions to the subject depending upon the subject's responses on prior
15   questions of said test to estimate the subject's abilities and dynamically determine the most appropriate starting point and difficulty level of subsequent questions of the test for that subject.

20   6. The evaluation system of claim 1 in which transmission of said stimuli includes transmission via the internet or a company intranet.

7. A personnel evaluation system comprising: a multimedia
25   computer for transceiving audio and visual stimuli for a subject; a storage memory of said system for storing application modules utilizing multimedia technology to assess skills and abilities in a manner which cannot be assessed by non-multimedia content or utilizing multimedia technology to
30   measure skills or abilities applicable to work-related tasks in a manner which is more clinically valid than the manner in which such skills or abilities must be measured when using only non-multimedia, text-based content; a central processing unit within said multimedia computer to administer said
35   application modules to said subject, perform analysis of input data, and cause said multimedia computer to transmit said stimuli; said application modules comprising a software

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application to complete at least one of the following tasks:
to store and evaluate all input data, simulate work-related
tasks, deliver stress-inducing audio or visual stimuli to
said subject, said stress-inducing audio or visual stimuli

5   being race, gender, ethnic, and cultural neutral, to interact
with said subject, and assess at least one of the
intelligence, interest, values, emotional status, mental
health, neurological impairment, education, social skills,
aptitude, processing speed, performance efficiency, task

10 focus, distractability resistance, stress-tolerance,
communication skills, knowledge, reasoning ability, logic
skills, job skills, vocabulary, emotional quotient (EQ),
impulsivity, risk-tolerance level, personality and specific
approach to problem solving; a software application in which

15 stimuli are presented to a subject, the subject responding to
the stimuli as best as he or she can, to determine the
precise ability level of the subject being evaluated; wherein
said storage memory of said system includes a scoring system
derived from database statistics calculated for a particular

20 job title, incorporating a suggested default list of
application modules to be administered for a specific job
title, a suggested weight and signification applied to each
said application module score in an overran suitability to
job title score, and a predetermined pass/fail threshold for

25 each said application module based on updated database
statistics reflecting past test results of prior subjects in
a similar job role; wherein said system incorporates the
ability to compare a subject's performance on a task under
non-stressful and stressful conditions to determine a

30 subject's stress tolerance level; wherein said stressful
conditions incorporates multimedia stressors using one or
more of the following: stressful music, stressful audio,
negative feedback, and restricted time deadlines for task
completion; wherein said system incorporates error pattern

35 analysis so as to determine not just the degree to which a
subject is affected by stress, but in what manner the subject
tends to become affected and in what manner his performance

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is most likely to change when placed in a stressful
environment; and wherein said system incorporates the ability
to automatically stop administration of remaining application
modules of said application modules, in the event that the
5 subject's performance is below a predetermined pass/fail
threshold for any particular application module of said
application modules.

8. A personnel evaluation system comprising: at least one
10 multimedia computer for transceiving audio and visual stimuli
for a subject from at least one of a hard drive of said
computer, or the Internet, or a company intranet, or
combination thereof; a storage memory of said system for
storing application modules; at least one central processing
15 unit within said at least one multimedia computer to
administer said application modules to said subject; perform
analysis of input data, and cause said multimedia computer to
transmit said stimuli; said application modules comprising at
least one software application to complete at least one of
20 the following tasks: to store and evaluate all input data,
simulate work-related tasks, deliver stress-inducing audio or
visual stimuli to said subject, said stress-inducing audio or
visual stimuli being race, gender, ethnic, and cultural
neutral, to interact with said subject, and assess at least
25 one of the intelligence, interest, values, emotional status,
mental health, neurological impairment, education, social
skills, aptitude, processing speed, performance efficiency,
task focus, distractability resistance, stress-tolerance,
communication skills, knowledge, reasoning ability, logic
30 skills, job skills, vocabulary, emotional quotient (EQ),
impulsivity, risk-tolerance level, personality and specific
approach to problem solving; a software application in which
stimuli are presented to a subject, the subject responding to
the stimuli as best as he or she can, to determine the
35 precise ability level of the subject being evaluated; wherein
said storage memory of said system includes a scoring system
derived from database statistics calculated for a particular

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job title, incorporating a suggested default list of
application modules to be administered for a specific job
title, a suggested weight and signification applied to each
said application module score in an overall suitability to
5   job title score, and a predetermined pass/fail threshold for
each said application module based on updated database
statistics reflecting past test results of prior subjects in
a particular job role or similar job role; and wherein when a
scoring ceiling or basal threshold is reached when the
10   subject misses a predetermined number of a consecutive
correct answers or answers a predetermined number of
consecutive questions correctly in said tests, said system
dynamically adapting by automatically moving on to easier or
more difficult sets of questions being presented to the
15   subject.

9. A personnel evaluation system comprising: at least one
multimedia computer for transceiving audio and visual stimuli
for a subject from at least one of a hard drive of said
20   computer, or the Internet or a company intranet, or
combination thereof; a storage memory of said system for
storing application modules; at least one central processing
unit within said at least one multimedia computer to
administer said application modules to said subject, perform
25   analysis of input data, and cause said multimedia computer to
transmit said stimuli; said application modules comprising at
least one software application for doing at least one of the
following tasks: utilizing multimedia technology to assess
skills and abilities in a clinically valid manner, or
30   utilizing multimedia technology to assess skills or abilities
applicable to work-related tasks in a more effective manner
than how those skills or abilities can be assessed by non-
multimedia content or utilizing multimedia technology to
compare the performance of a subject on a specific task with
35   distractions present to the performance of the same subject
on the same or similar task without distraction present, in a
more effective manner than can be assessed when utilizing

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non-multimedia content or utilizing multimedia technology to
compare the performance of a subject on a specific task when
under stressful conditions to the same subject's performance
on the same or a similar task when under less stressful or
5   non-stressful conditions, in a more effective or real life
manner than can be assessed by utilizing non-multimedia
content or utilizing multimedia technology to assess the
social skills of a subject using audio and facial expressions
or social interactions, in a more effective manner than can
10   be assessed by utilizing non-multimedia content, or
combinations thereof; a software application in which stimuli
are presented to a subject, the subject responding to the
stimuli as best as he or she can, to determine the precise
ability level of the subject being evaluated; and wherein
15   said storage memory of said system includes a scoring system
derived from database statistics calculated for a
representative sample pf a specific population being tested
and a predetermined pass/fail threshold for each said
application module based on updated database statistics
20   reflecting past test results of prior subjects in a similar
job role.

10. A personnel evaluation system comprising: at least one
multimedia computer for transceiving audio and visual stimuli
25   for a subject from at least one of a hard drive of said
computer, or the Internet or a company intranet, or
combination thereof; a storage memory of said system for
storing application modules; at least one central processing
unit within said multimedia computer to administer said
30   application modules to said subject, perform analysis of
input data, and cause said multimedia computer to transmit
said stimuli; said application modules comprising at least
one software application for doing at least one of the
following tasks: utilizing multimedia technology to assess
35   skills and abilities in a clinically valid manner or
utilizing multimedia technology to assess skills or abilities
applicable to work-related tasks in a more effective manner

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than how those skills or abilities can be assessed by non-
multimedia content or utilizing multimedia technology to
compare the performance of a subject on a specific task with
distractions present to the performance of the same subject
5   on the same or similar task without distraction present, in a
more effective manner than can be assessed when utilizing
non-multimedia content or utilizing multimedia technology to
compare the performance of a subject on a specific task when
under stressful conditions to the same subject's performance
10   on the same or a similar task when under less stressful or
non-stressful conditions, in a more effective or real life
manner than can be assessed by utilizing non-multimedia
content or utilizing multimedia technology to assess the
social skills of a subject using audio and facial expressions
15   or social interactions, in a more effective manner than can
be assessed by utilizing non-multimedia content, or
combinations thereof; a software application in which stimuli
are presented to a subject, the subject responding to the
stimuli as best as he or she can, to determine the precise
20   ability level of the subject being evaluated; wherein said
storage memory of said system includes a scoring system
derived from database statistics calculated for a particular
job title, incorporating a suggested default list of
application modules to be administered for a specific job
25   title, a suggested weight and signification applied to each
said application module score in an overall suitability to
job title score, and a predetermined pass/fail threshold for
each said application module based on continually updated
database statistics reflecting past test results of prior
30   subjects in a particular job role or similar job role; and
wherein when a scoring ceiling or basal threshold is reached
when the subject misses a predetermined number of a
consecutive correct answers or answers a predetermined number
of consecutive questions correctly in said tests, said system
35   dynamically adapting by automatically moving on to easier or
more difficult sets of questions being presented to the
subject.

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11. A personnel evaluation system comprising: at least one
multimedia computer for transceiving audio and visual stimuli
for a subject from at least one of a hard drive of said
5   computer, or the Internet or a company intranet, or
combination thereof; a storage memory of said system for
storing application modules; at least one central processing
unit within said multimedia computer to administer said
application modules to said subject, perform analysis of
10 input data, and cause said multimedia computer to transmit
said stimuli; said application modules comprising at least
one software application for doing at least one of the
following tasks: utilizing multimedia technology to assess
skills and abilities in a clinically valid manner or
15 utilizing multimedia technology to assess skills or abilities
applicable to work-related tasks in a more effective manner
than how those skills or abilities can be assessed by non-
multimedia content or utilizing multimedia technology to
compare the performance of a subject on a specific task with
20 distractions present to the performance of the same subject
on the same or similar task without distraction present, in a
more effective manner than can be assessed when utilizing
non-multimedia content or utilizing multimedia technology to
compare the performance of a subject on a specific task when
25 under stressful conditions to the same subject's performance
on the same or a similar task when under less stressful or
non-stressful conditions, in a more effective or real life
manner than can be assessed by utilizing non-multimedia
content or utilizing multimedia technology to assess the
30 social skills of a subject using audio and facial expressions
or social interactions, in a more effective manner than can
be assessed by utilizing non-multimedia content, or
combinations thereof; a software application in which stimuli
are presented to a subject, the subject responding to the
35 stimuli as best as he or she can, to determine the precise
ability level of the subject being evaluated; wherein said
storage memory of said system includes a scoring system

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derived from database statistics calculated for a particular
job title, incorporating a suggested default list of
application modules to be administered for a specific job
title, a suggested weight and signification applied to each
5   said application module score in an overran suitability to
job title score, and a predetermined pass/fail threshold for
each said application module based on updated database
statistics reflecting past test results of prior subjects in
a similar job role; wherein said system incorporates the
10 ability to compare a subject's performance on a task under
non-stressful and stressful conditions to determine a
subject's stress tolerance level; wherein said stressful
conditions incorporates multimedia stressors using one or
more of the following: stressful music, stressful audio,
15 negative feedback, and restricted time deadlines for task
completion; wherein said system incorporates error pattern
analysis so as to determine not just the degree to which a
subject is affected by stress, but in what manner the subject
tends to become affected and in what manner his performance
20 is most likely to change when placed in a stressful
environment; and wherein said system incorporates the ability
to automatically stop administration of remaining application
modules of said application modules, in the event that the
subject's performance is below a predetermined pass/fail
25 threshold for any particular application module of said
application modules.

12. A personnel evaluation system substantially as
hereinbefore described with reference to the accompanying
30 Figures.

FIG. 1

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Vocabulary

Directions:

13 { *You are going to see some pictures. Then, you will hear a word. Click on the picture that goes with the word. You may use the same picture as your answer more than once. Let's try one together.*

14 {
Trial item 1: Chair.
Good! Now, try some more.
(That's not quite right. This is the picture that goes with the chair. Now, try more)

Trial item 2: Sharpener.
Good! Now, try some more.
(That's not quite right. This is the correct answer. Now try more)

Trial item 3: Calculator.
Good! Now, try some more.
(That's not quite right. This is the correct answer.)

FIG. 2

Information
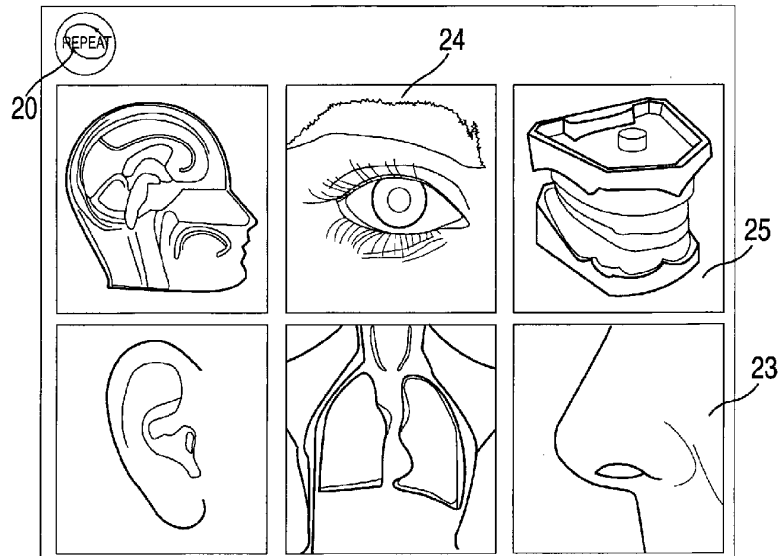
Directions:

21 *You are going to hear some questions. Click on the picture that best answers each question. You may use the same picture as your answer more than once. Let's try one together.*

22

Trial item 1: Which one of these is a picture of a nose?
Good. Now try some more.
(That's not exactly right. Listen again. This is the picture of a nose. Now try some more.)

Trial item 2: Point to the picture of an eye.
Good. Now try some more.
(That's not quite right. Listen again. This is the correct answer. Now try more.)

Trial item 3: Which of these is a picture of teeth?
Good. Now try some more.
(That's not quite right. Listen again. This is the correct answer. Now try more.)

FIG. 3

Categorization

29
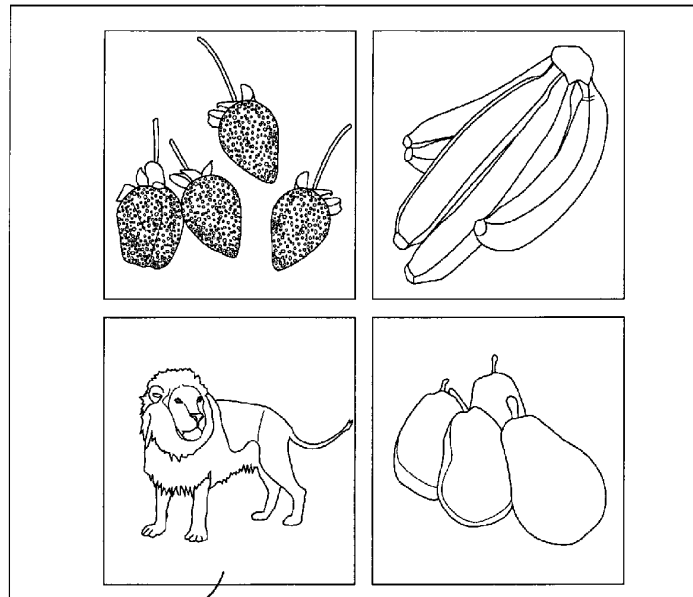
Directions:

27 { *You are going to see four pictures. Three of the pictures are alike in some way and one picture is not like the others. Choose the picture that does not belong with the others. Let's try one together.*

28 { Trial item 1:
Good. Now try some more.
(That's not quite right. These three are alike because they are all fruits. This one is not a fruit so it does not belong with the others. Now try more.)

Trial item 2:
Good. Now, try some more.
(That's not quite right. This is the correct answer. Now try more.)

FIG. 4

Social Apperception

32

35
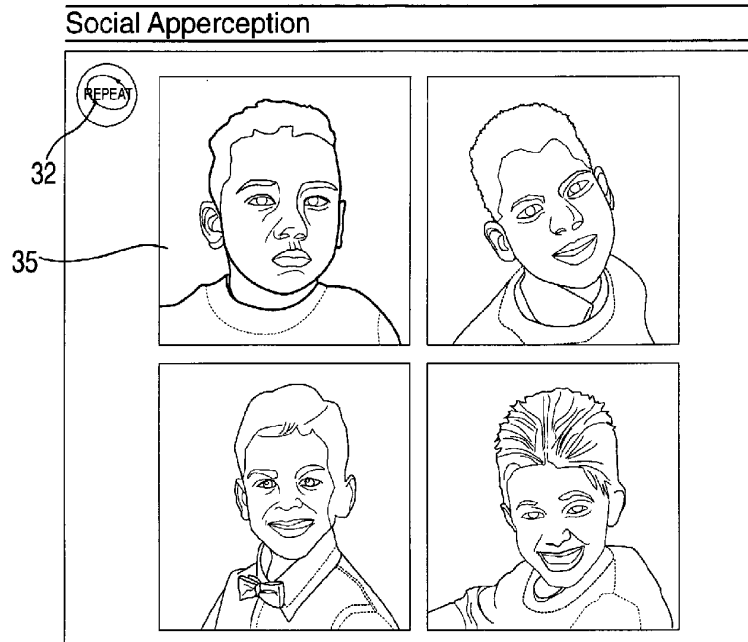
Directions:

33 *You are going to see pictures of people who are thinking or feeling many different things. Then you will hear someone speak. Choose the person that goes with what you heard. You may use the same picture as your answer more than once. Let's try one together.*

34 <u>Trial item 1</u>: I don't care what you think!
Who do you think said that?
Good! Now try some more. Work as quickly and as carefully as you can.
(That's not quite right. Listen again. The boy who is speaking sounds angry. This picture is the right answer because it shows a boy that is angry. Now try more.)

FIG. 5

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Auditory Memory

Directions:

38 *Before we begin, let's take a moment to review some numbers. When you hear a number, point to it on the screen.*

Point to *6*
Good!
(This is the number 6, try again.)

Point to *9*
(This is the number 9, try again.)

39 Point to *5*
(This is the number 5, try again.)

Point to *2*
Good! Let's continue.
(This is the number 2, try again.)
Good! Let's continue.
(That's not quite right. Now, ask the person helping you to choose one of these options.)

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

40

(CANCEL)　　　　　　　　　　　　　　　(OK)

41
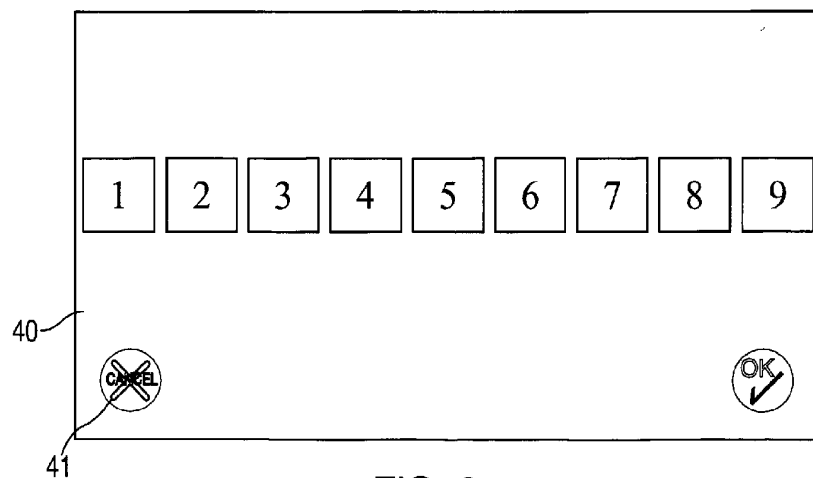
FIG. 6

Auditory Memory with Visual Distractions
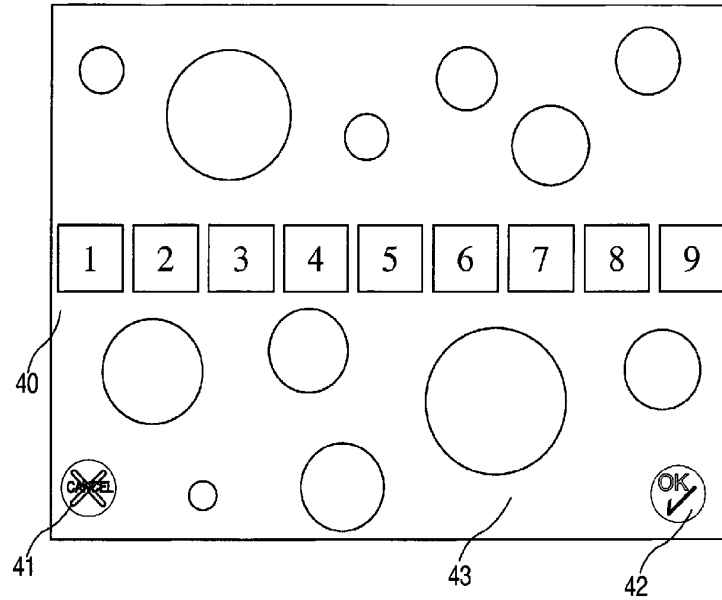
Directions:

45 { *Listen carefully. You are going to hear numbers in a certain order. Pay close attention. This time, you will see things on the screen as you hear the numbers. Click on the numbers in the same order they were said. Let's begin.*

46 { Oral administration of Auditory Memory with Visual Distractions:
Listen carefully. You are going to hear numbers in a certain order. Pay close attention. This time, you will see things on the screen as you hear the numbers. Repeat the numbers in the same order they were said. Let's begin.

Items:

47 {
7-9
6-1
4-7
9-8-4
1-6-9

FIG. 7

Visual Memory

Directions:

50 { *Before we begin, let's get familiar with some new shapes. Each time you see a shape here... find it on the bottom.*

51 {
(Shapes are presented individually.)
(That's not quite right. This is the right shape. Let's try it again)

Good! Now you are ready to begin.
(Now, ask the person helping you to choose one of these options.)

Watch the screen carefully. Shapes will be appearing in a certain order. Pay close attention. When it is your turn, click on these shapes in the same order. Click on the OK button when you are done. If you want to change your answer, you will have one chance to click on the CANCEL button... and begin your answer again. Let's try one together.

FIG. 8
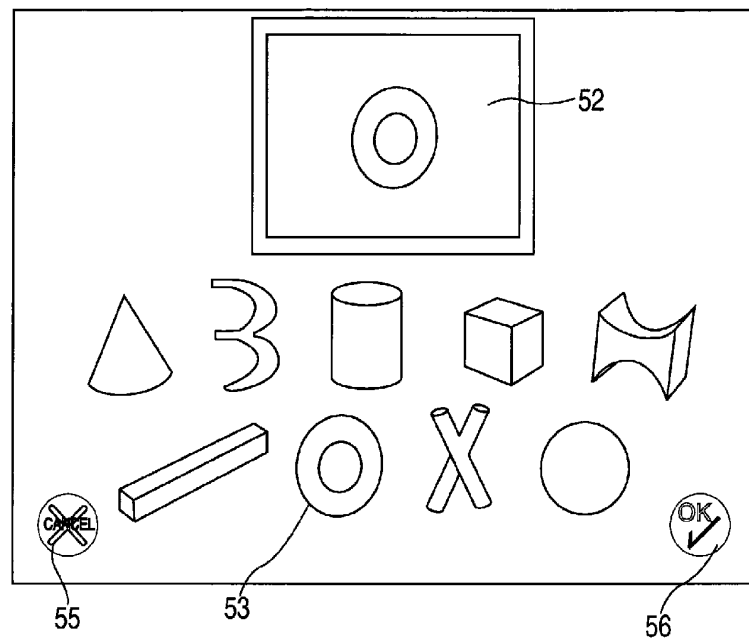
Trial item 1:

Good! Now try some more.

(That's not quite right. Watch how I do it. Now try some by yourself.)

FIG. 9

Visual Closure

Directions:

60 { *Look at the screen. A picture is coming. When you know what the picture is, click on the screen. Here it comes.*   63   62

64
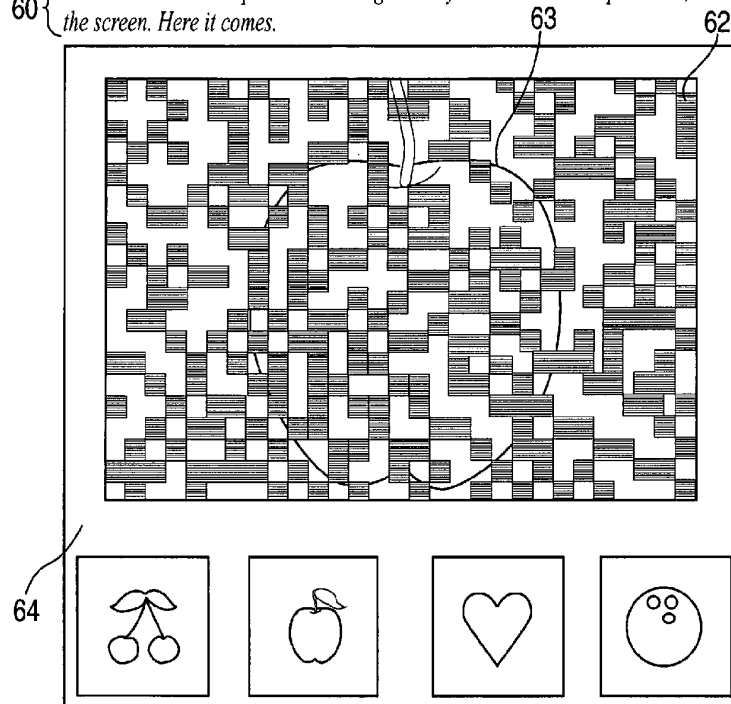
- *Please Note: The picture is revealed progressively and when the examinee guesses he clicks in the screen, the picture disappears and he gets the four symbols to choose from.*

-

61 { *Trial item 1 (apple)*
(Remember - click on the screen when you know what the picture is)
Now choose from these buttons to show what the picture is.
Good! Now watch the screen to see the whole picture.
You were right! It is a picture of an apple. Now try some more.
(That's not quite right. Watch the screen to see the whole picture.
You see, it is a picture of an apple. This is the correct answer. Now try more)

FIG. 10
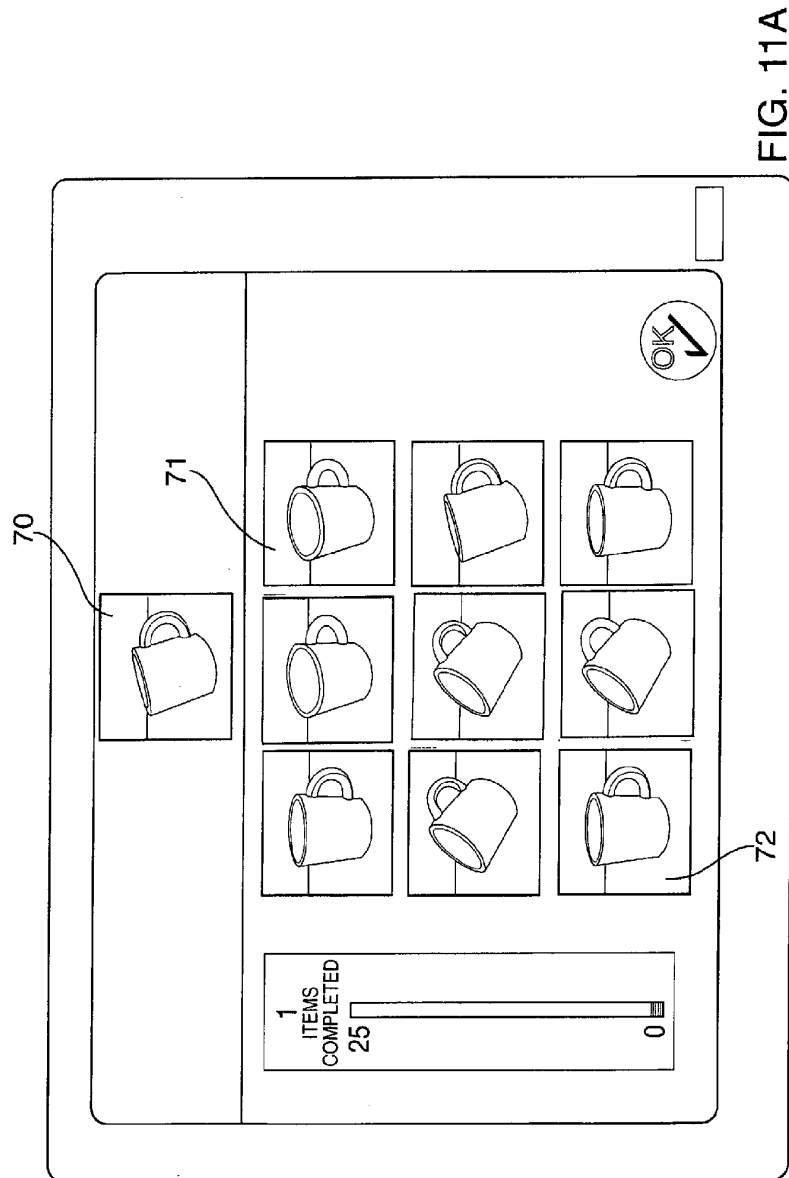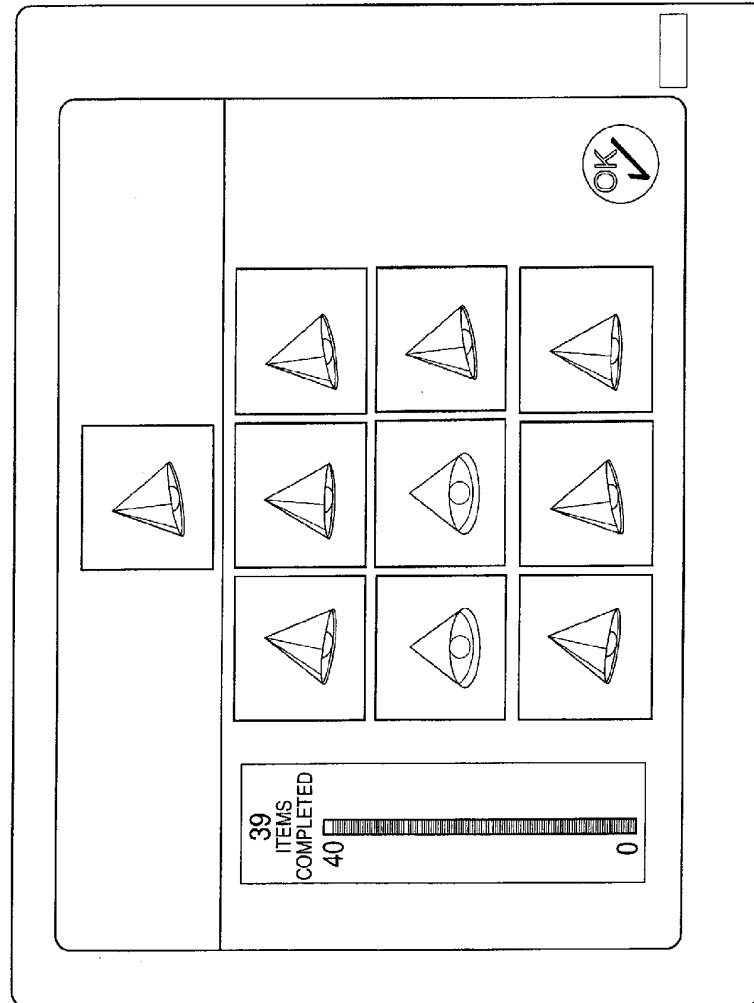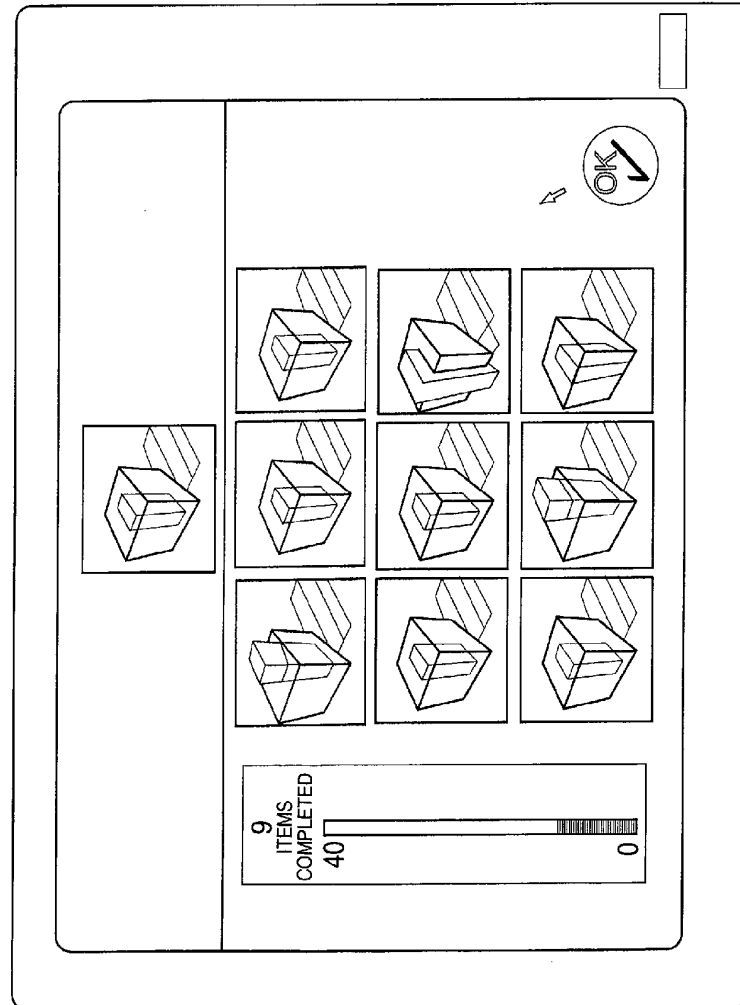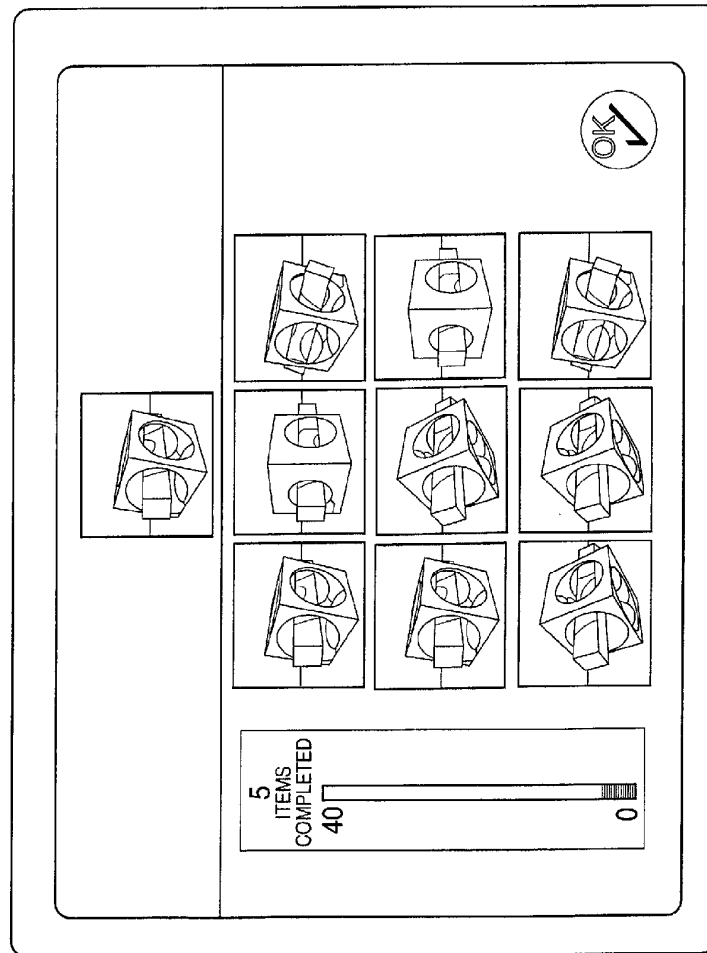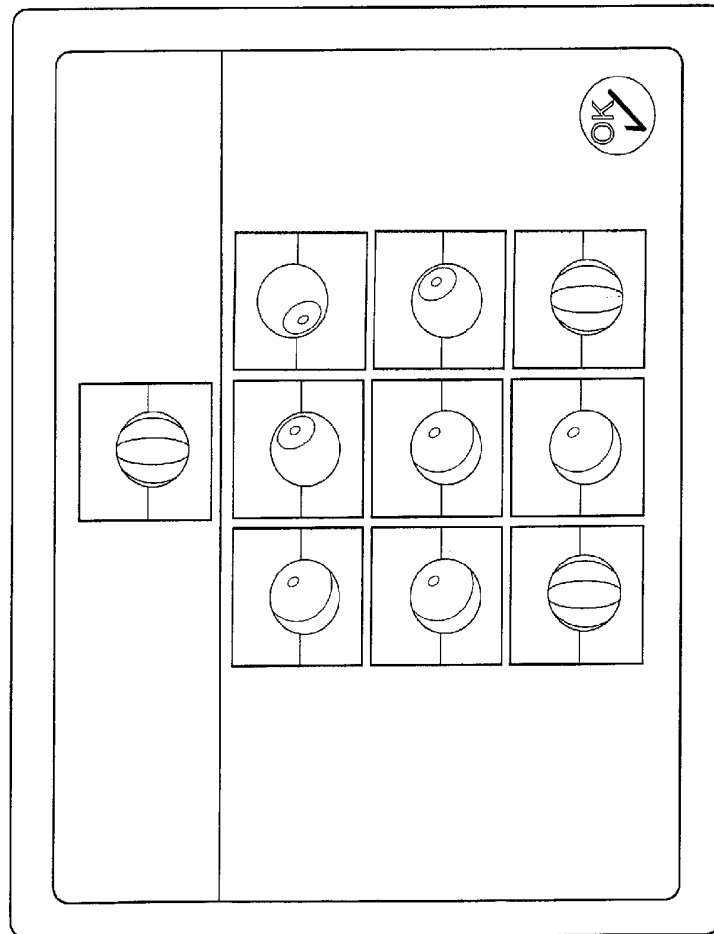
FIG. 11A

FIG. 11B

FIG. 11C

FIG. 11D

FIG. 11E
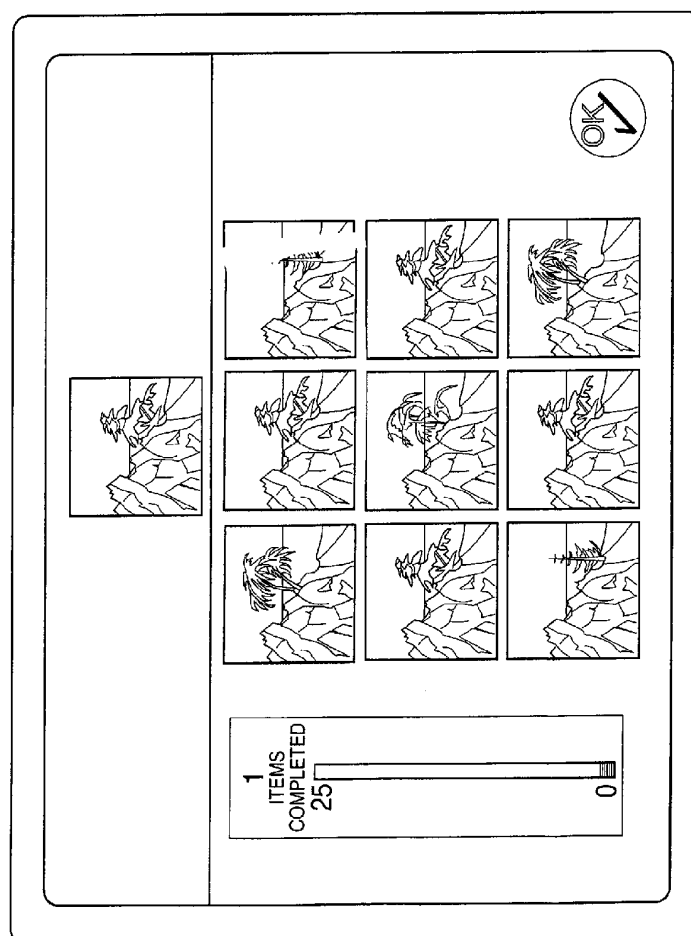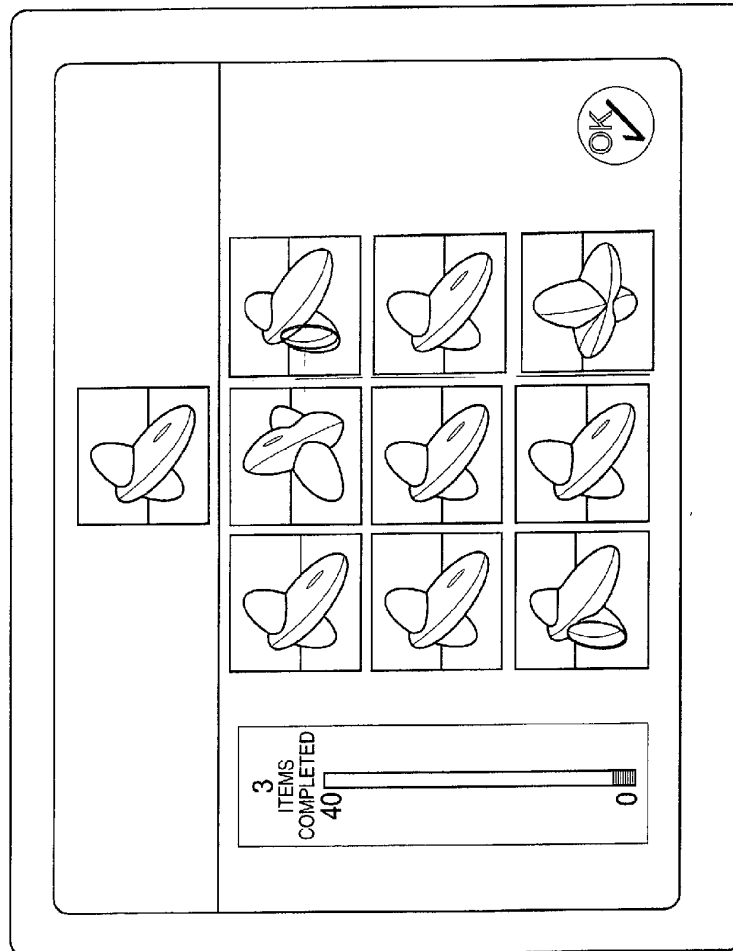
FIG. 11F

FIG. 11G

Stress:
Regular part instructions:
(BOB_1)
Look at the picture on top.

(BOB_2)
Now look at these pictures, some of them are exactly the same as the one on top, others are different.
You will be asked to choose all the pictures that are the same as the one on top.
If you make a mistake, you can change your answer by clicking on it a second time.
Watch how this is done.

(BOB_3)
This picture is not the same as the one on top.
Cancel this choice by clicking on it again.

(BOB_4)
Good.
Now find all the pictures that match the one on top.

(BOB_5)
Click on the OK button when you are done.

(BOB_6)
Now try some more by yourself.

(BOB_7)
That's not quite right.

(BOB_8)
These are the correct answers.
Now try some more.

(FINAL B 3)
You have exactly 2 and a half minutes.
You are not working fast enough, try harder.
You better work faster if you want to finish in time.
You have less than two minutes left.

FIG. 12A

You've lost some points, be more careful.
You're not working fast enough, try harder
You have a minute and a half left.
You've lost some points, be more careful.
You better work faster, if you want to finish in time.
You have only one minute left,
Hurry, you are running out of time.
You've lost some points, be more careful.
You're not working fast enough, try harder.
You have only 30 seconds left.
Hurry, you're running out of time.
You have only 20 seconds left.
You have 15 seconds to finish, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1.

(GOOD)
Good, now try some more.
Remember, work as quickly and as carefully as you can.

(THIS IS)
These are the correct answers.

(TRY MORE)
Now, try more.

(WRONG)
That's not quite right.

Stress part instructions:
    "Now, Let's try some more. This time you will have only 20 seconds
for each item.
        Work quickly and carefully, you will have only 2 and a half minutes
        to finish all of them. Be careful you will lose points for every wrong
        answer, ready GO."
"Congratulations! You have completed the stress tolerance test."
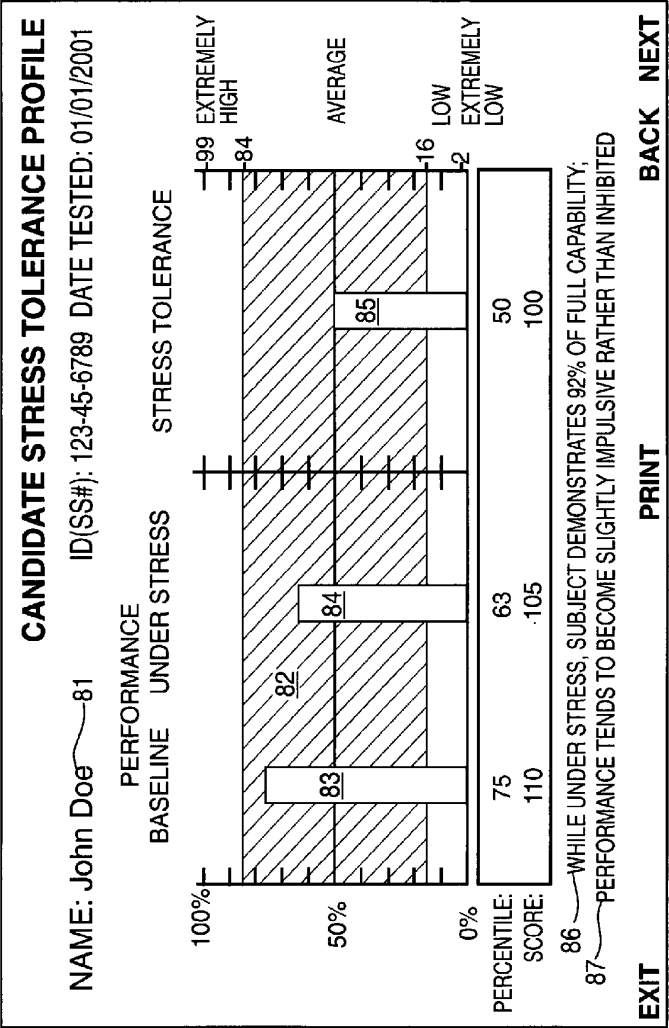

FIG. 12B

FIG. 13A

FIG. 13B

Name: D.O.B.   Test Date: 1/30/2001
ID Number 12222

Please fill in the following information:

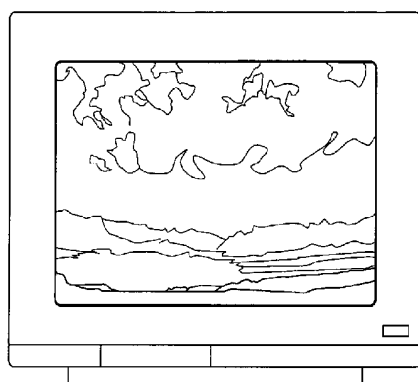|	Baseline	After Part I (Pure Task)	After Part II (Task w/stress)	After Part III (Relaxation)	Peak
Heart Rate					
GSR (Galvanic Skin Response)					
Skin Temperature					
Thoracic Respiration					
Abdominal Respiration					
BVR (Blood Volume Pulse)					
EMG (Muscle Tension)					
Blood Pressure	/	/	/	/	/

PRINT

FIG. 13C

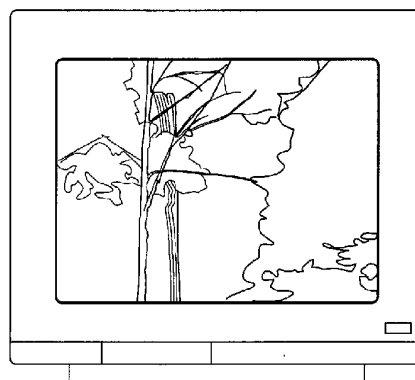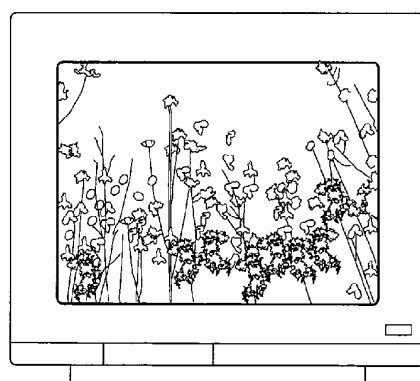FIG. 13D

FIG. 13E

23/24

32. Drug use is a private affair.
    1.   True
95   2.   False

33. A shoplifter should be arrested.
    1.   Only if the amount stolen is more than $300
    2.   Only if the amount stolen is more than $200
    3.   Only if the amount stolen is more than $100
    4.   Only if the amount stolen is more than $50
    5.   Only if the amount stolen is more than $10
    6.   In any case, no matter what amount was stolen

34. Do people cheat for personal gain?
    1.   Yes
    2.   No

35. How many times in the past did you witness a bribery?
    1.   More than five times
    2.   Five times
    3.   Four times
97   4.   Three times
    5.   Twice
    6.   Never
    7.   Only once
    8.   Don't remember

36. Do you think drug use increases your ability to function?
    1.   Yes
    2.   No
95   3.   Depends what drug.

37. If you're already stealing, you might as well steal a lot?
    1.   True
    2.   False

38. Would you report minor shoplifting?
    1.   Yes
    2.   No
    3.   Don't know

39. "People will hide their past in order to get a new job."
    1.   True
    2.   False

40. Is theft more severe than bribery?
    1.   Yes
    2.   No
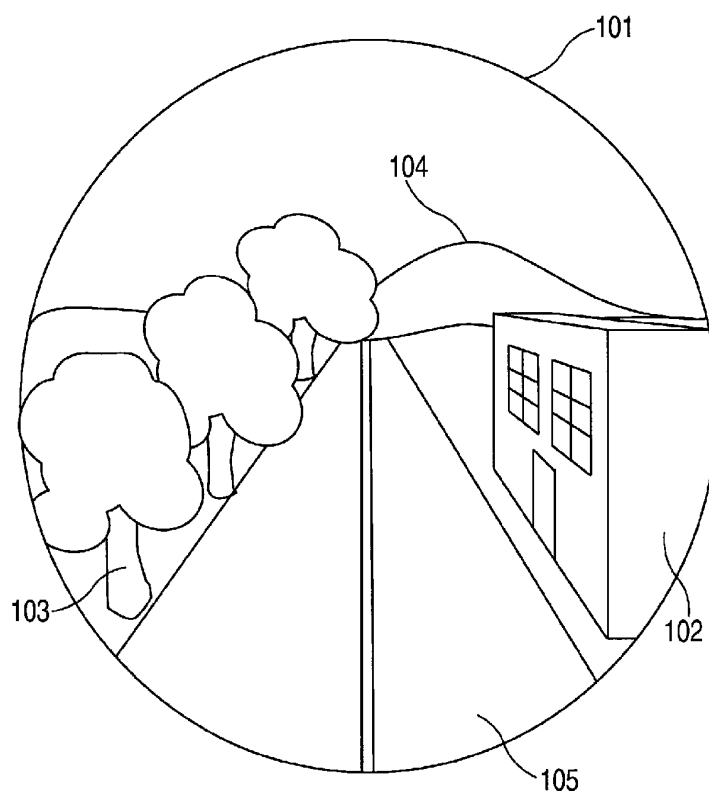   3.   Don't know
97

FIG. 14

FIG. 15