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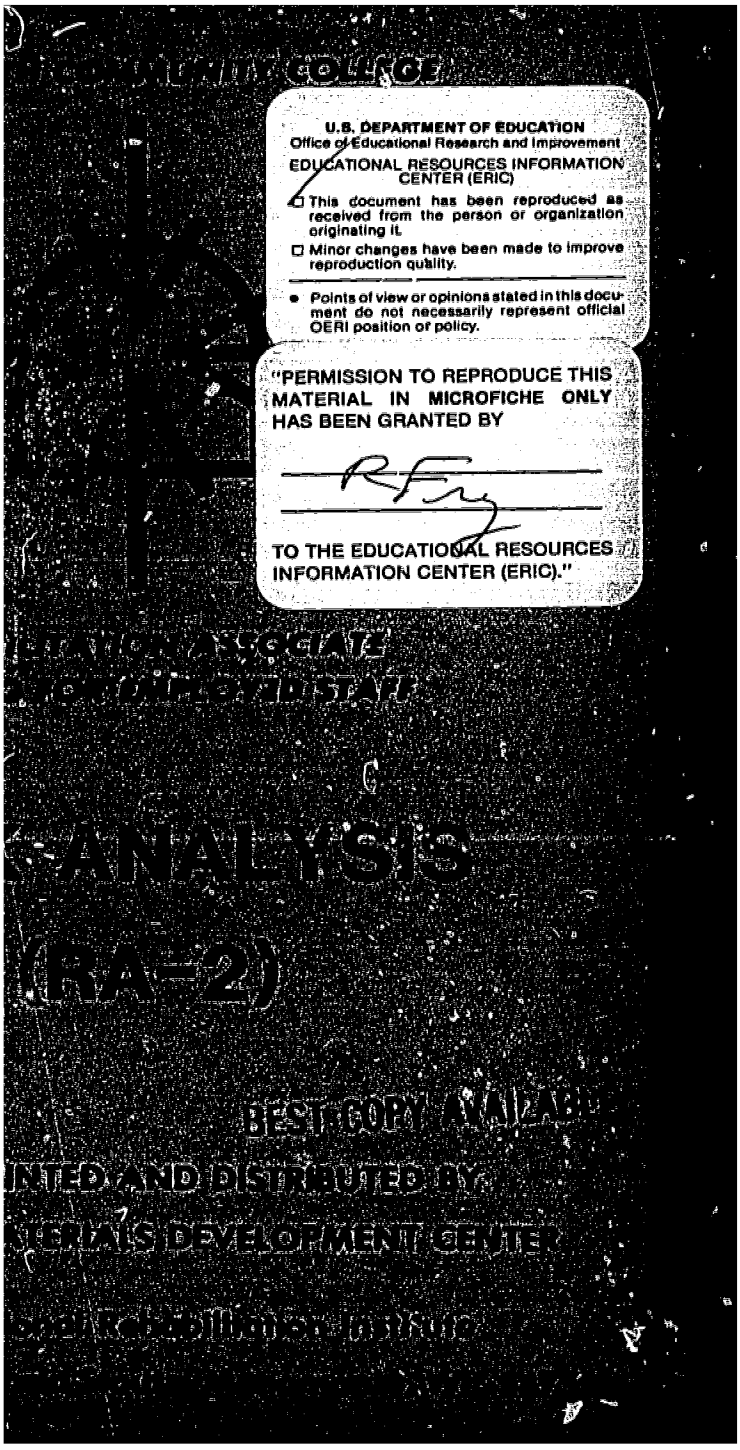
ABSTRACT

This learning module, which is intended for use in in-service training for vocational rehabilitation counselors, deals with writing a task analysis. Step-by-step guidelines are provided for breaking down a task into small teachable steps by analyzing the task in terms of the way in which it will be performed once learned (method), the steps to be taught in sequence (content), and the teaching method to be used (process). Guidelines are also presented for giving the proper amount of training and for redoing the task analysis process if material turns out to be too difficult or easy for an individual client. A brief history and rationale for task analysis are provided. Special emphasis is placed on the relevance of task analysis to vocational rehabilitation. Also provided are sample analyses of tasks performed by a single individual (handwashing, greeting, soldering, and baking a jiffy-mix cake), and a task involving more than one participant (playing catch). An annotated bibliography included in the module describes five commercially available task analyses. An appendix includes a sample analysis of the task of throwing a ball one-handed and over-hand that is complete with a task statement, statement of the method to be used, a list of the 13 steps required to perform the task, and a process breakdown (including format, feedback, and procedural guidelines). (MN)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ANALYSIS
(RA-2)
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TASK ANALYSIS

by

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R.A.T.E.S.

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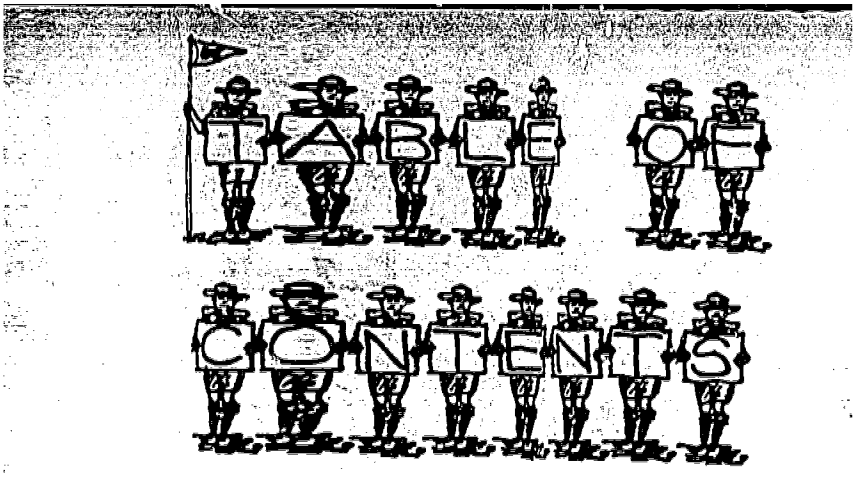
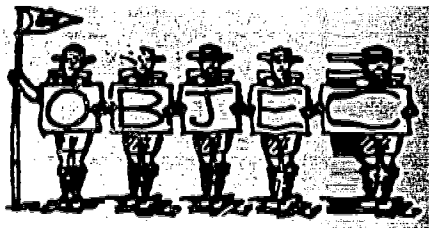
REHABILITATION ASSOCIATE TRAINING
FOR EMPLOYED STAFF

MODULE: RA-2 Task Analysis

CONTENTS: *Content, method, process, chaining, format, feedback, procedure.*

OVERVIEW: Task analysis is the process of breaking down a task into small, teachable steps by analyzing tasks in terms of method (way in which the task will be done when learned), content (steps to be taught in sequence), and process (teaching method to be used). A brief history and rationale for task analysis is provided.

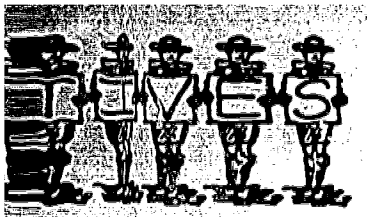




BEHAVIOR

1 List 3 reasons why task analysis is useful.

2 Write a task analysis.



EVALUATION

1 Class test

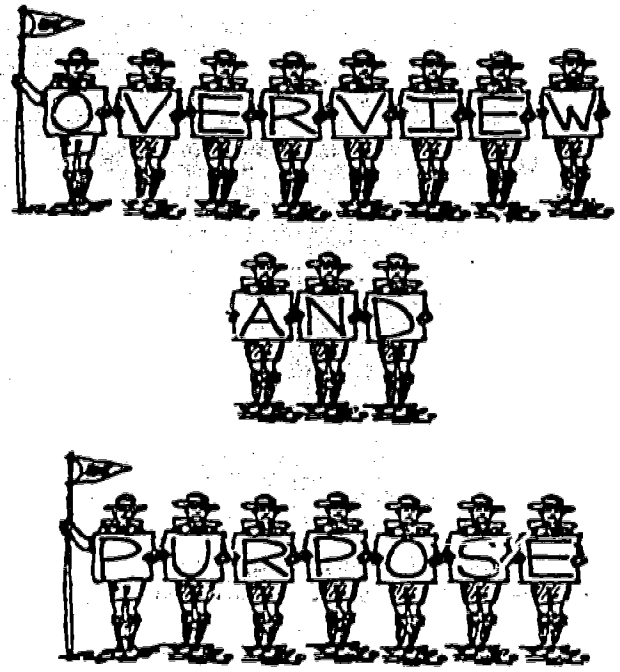
2 Class test. A skill will be listed to be task analyzed. Must meet the following criteria.

a. It is detailed enough so that someone unfamiliar with the task can perform it

b. It is written in simple sentences

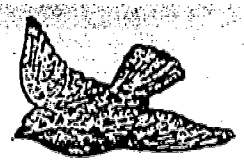
c. All steps are observable and stated in terms of client behavior.

d. The steps are written in correct sequence.



NOTE: Due to the nature of this module, many of the examples and exercises encompass self-help skills. These skills will be more familiar to students in practicing task analyses than vocational specific skills (i.e., building pallets) which may be familiar to only a few.

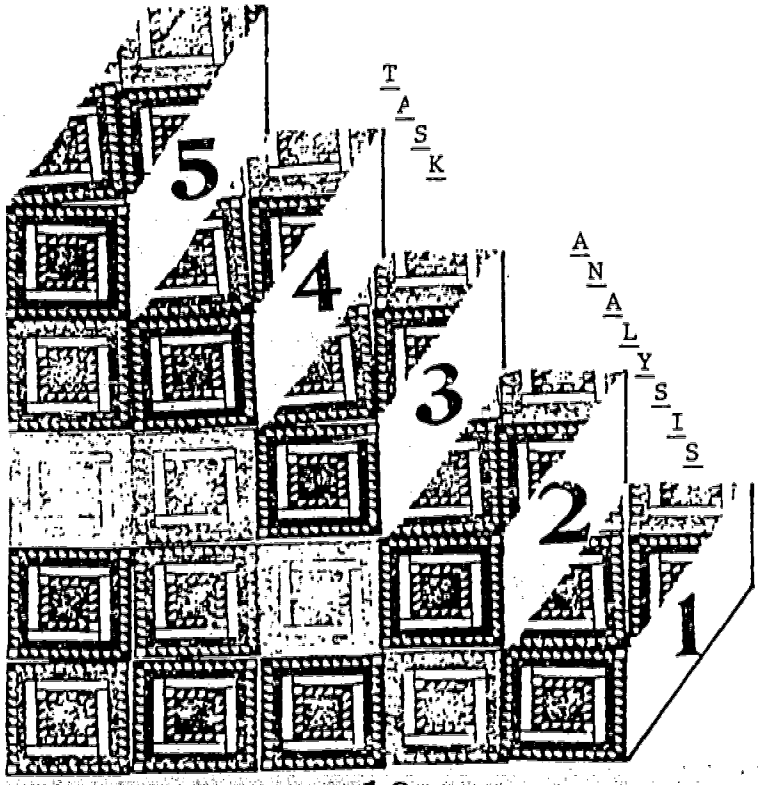
DEFINITION



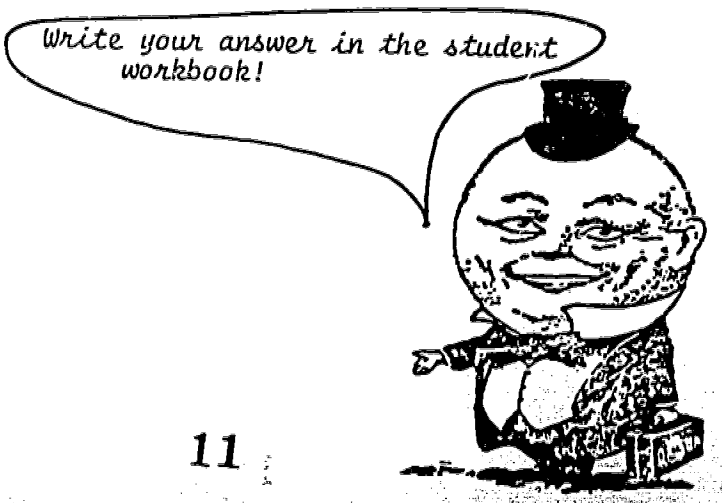
Have you ever tried to read instructions on how to put together a toy or fix your car? If you have, you know that some instructions are clear and helpful. Other instructions leave you confused and frustrated.

Clear instructions are written simply. They represent a task in a sequence of steps, one step at a time. They make clear what materials and tools you need.

Task analysis is similar to the process of preparing clear instructions. *Task analysis is breaking down a task into steps:*



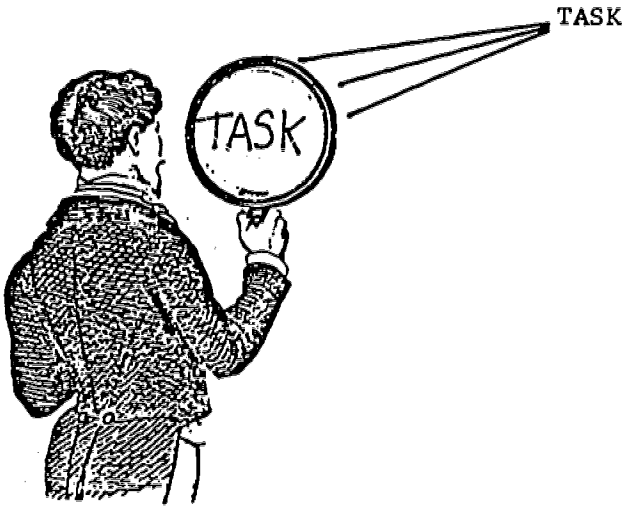
What is a task analysis?



RELEVANCE TO REHABILITATION

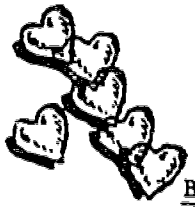
When you are working with nonhandicapped people on simple or familiar tasks, you can often simply show them how to do the task. When tasks are more complex, however, or when the people you are teaching have difficulty in learning, you need to use more powerful teaching methods.

The clients we deal with often have great difficulties in learning new skills. Many of the skills they are to be taught must first be broken down into small, teachable steps. These steps must be sequenced in both a logical and effective order. Thus, we do a task analysis; *we analyze the task and break it down into these small steps.*



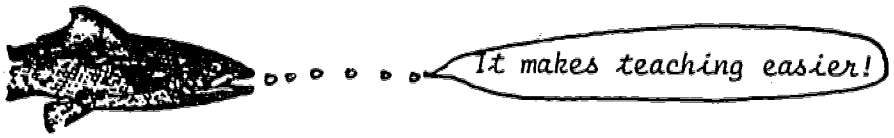
TASK ANALYSIS:

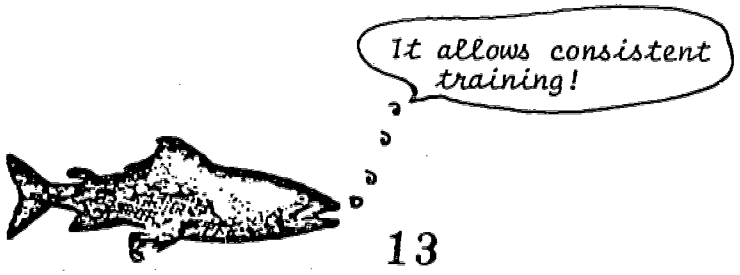
WE ANALYZE THE TASK



BENEFITS

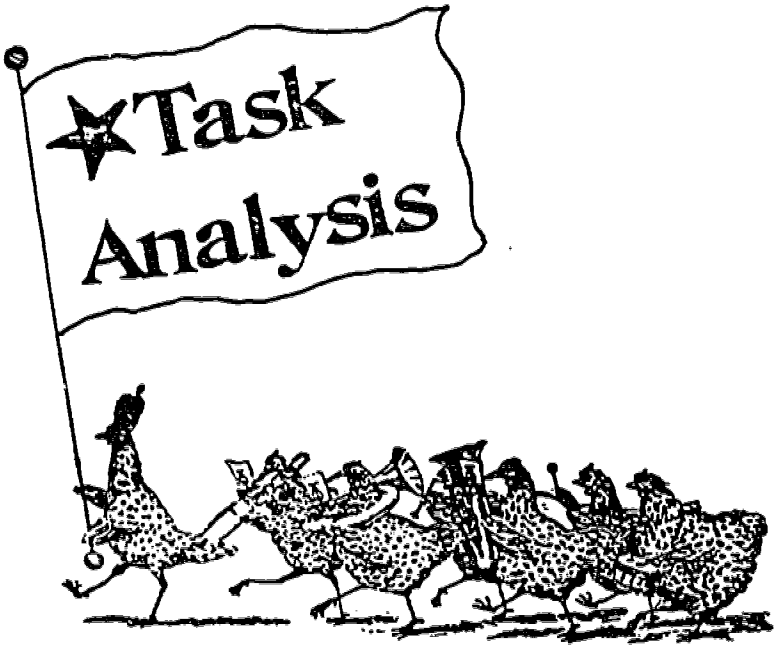
There are several reasons why task analysis is useful:



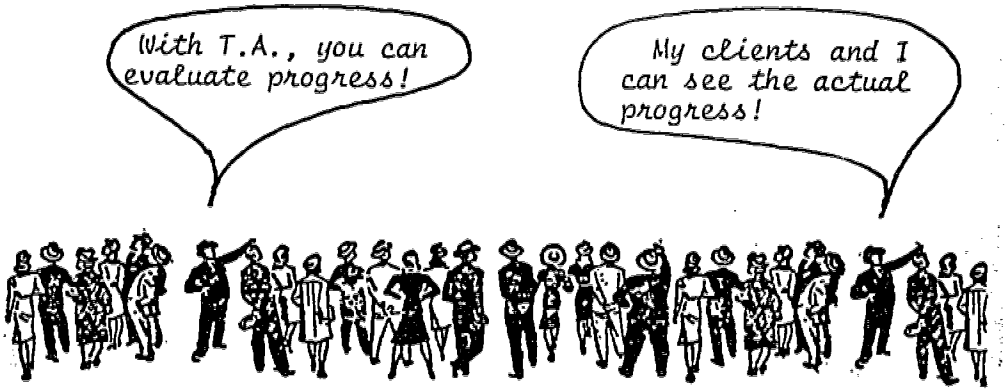


Makes Teaching Easier. In teaching, we often give long instructions and/or confusing demonstrations. Then we complain that the student is too retarded to learn the skill. There have been many demonstrations that handicapped clients can learn very complex skills if these skills are broken down into a consistent and clear set of simple skills. Then, each simple skill can be taught and sequenced in a chain. When the chain of simple skills has been learned, the complex skill has been learned.

Breaking the skill into components allows the instructor to present simple skills to the client to learn. It also makes it easier for the instructor to point out what parts of a demonstration are important to look at, and it makes clear to the instructor what the important things are to say in an instruction.

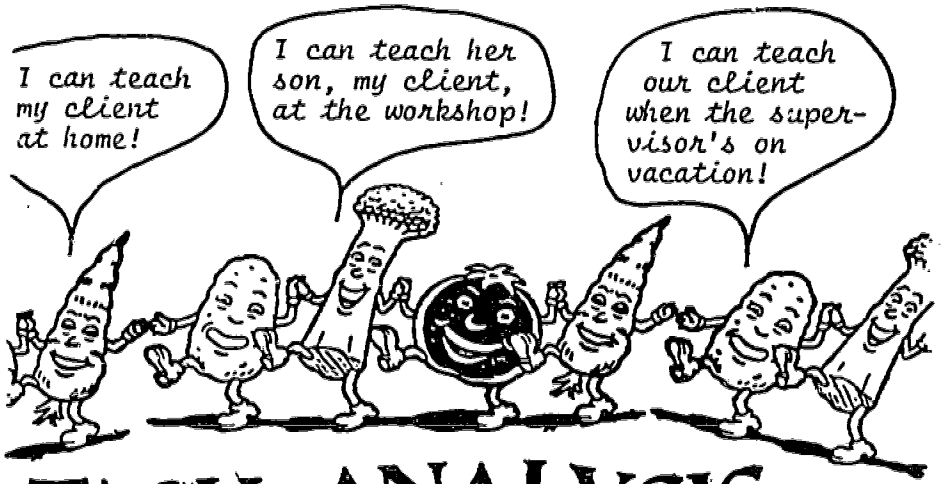


Allows Individualized Instruction We all have seen situations where several clients are unable to complete a skill, but they each have a different problem. In an assembly task, one unsuccessful client has trouble grasping, another puts things together backwards, another selects the wrong parts. In nose-blowing, one client simply allows her nose to run but blows it correctly when told; another identifies that it is running and puts her finger in her nose (and then perhaps in her mouth): and another uses a tissue or handkerchief but does not wipe away all the mucus. These people all need help with different steps in the process of completing the task. Add to that the physical barriers that many clients have (such as weakness or dysfunction of one arm and hand) and it is clear that teaching of the same task must be adapted for differenct clients. *Task analysis shows the instructor the steps at which the client does and does not succeed; it clarifies what subskills the client has yet to learn; that is, what must still be taught. It also allows clients to work at their own rates of progress.*



Evaluation. In order to evaluate whether clients are reaching or making progress toward their short-term objectives, some way to measure progress must be establishe The measurement method must allow different people to agree on the amount of progress. Task analysis provides one such way; *progress can be measured in terms of the amount of help a client needs in order to complete steps.* This type of evaluation is much more precise than simply measuring the complete task. Being able to do the complete task may be the long term goal and may require an extensive amount of instruction and practice. *Without a task analysis to show progress, instructors may become discouraged. With the task analysis, they and their clients can see the actual progress which is being made.*

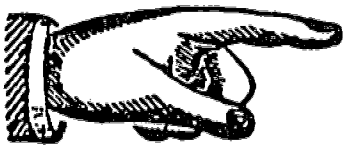
Allows Consistent Training Many skills may be taught by more than one person. A client may be learning how to cook in a workshop and also at home. Floor supervisiors in two different areas may be teaching a client to use a screwdriver. Sometimes, substitute instructors are required when one trainer is ill, on vacation, or quits his/her job. When different people teach a skill in different ways, the progress in learning that skill is slowed. This is especially true for severely retarded clients who need consistent training. The task analysis makes it easier to communicate exactly which steps are being taught and how they are being taught.



TASK ANALYSIS

Because of these four advantages, it is often useful to task analyze skills to be taught. This may actually occur before or after setting the short-term objectives.

Why is task analysis useful ?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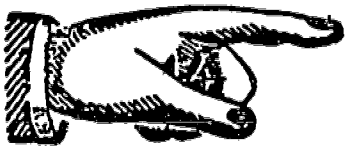
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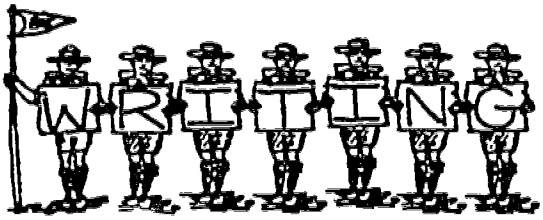
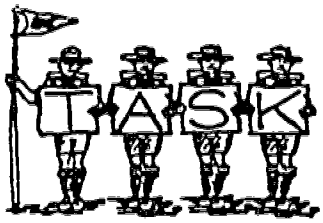
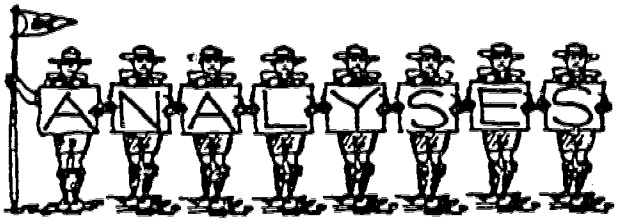

WRITING


TASK

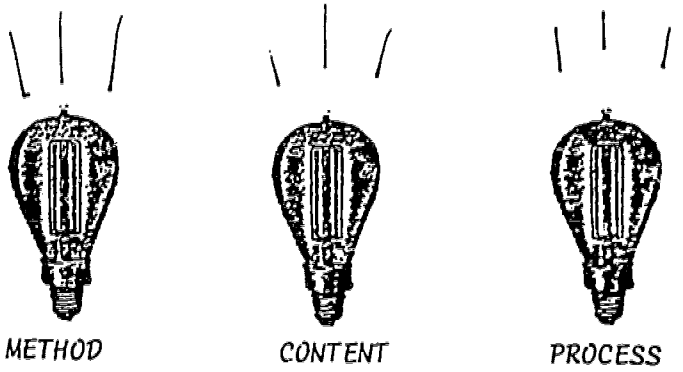

ANALYSES

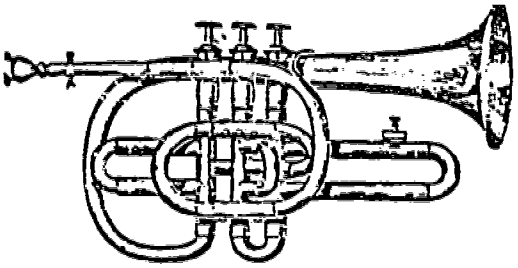
There are three major components/considerations in doing a task analysis:

1. *Method:* the *way* in which the task is to be performed.

2. *Content:* the *steps* into which the chosen method is to be divided.

3. *Process:* the *strategies* for teaching the content.





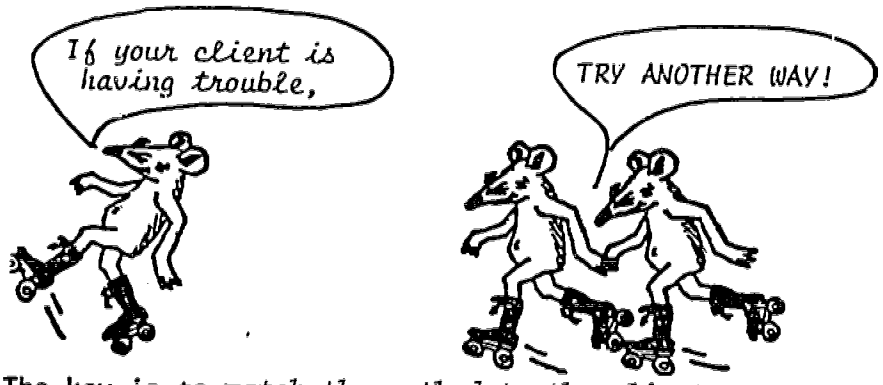
METHOD

Method refers to <u>how</u> the behavior/task will be performed and what permanent prompts or jigs may be used. For most tasks, there are usually a variety of different ways (methods) they can be completed. *For example:*

You can throw a softball overhand, or you can throw it underhand, or you can throw it. . .

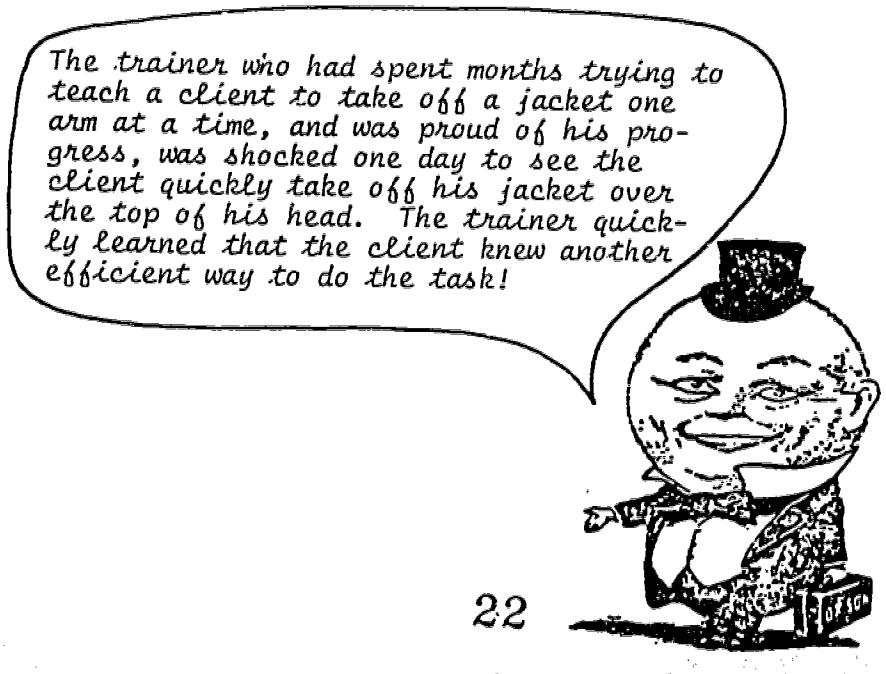
You can greet people by saying *"hello,"* or you can greet them by shaking hands, or you can greet them by. . .

You can mow a lawn with a push mower, or you can mow a lawn with a power mower, or you can mow a lawn with. . .



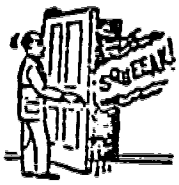
The key is to *match the method to the client.* Clients often are not allowed to do a task because they don't do them the way <u>we</u> do them. Why not, as Marc Gold says, *"Try another <u>way</u>."* That's what method is all about... trying another way. If a client is having trouble doing a task one way, try another way. Try another method.

Trying method means



Here are some possible methods for *greeting people*.

Method 1



Open door if necessary.

Shake hands.

Say "Hello."

Tell your name.

Make an offer (e.g., seat, coffe, get someone).

That method would be appropriate for greeting a stranger, entering a group home. In a vocational setting, the following might be more appropriate:

Method 2

Continue working til person approaches.

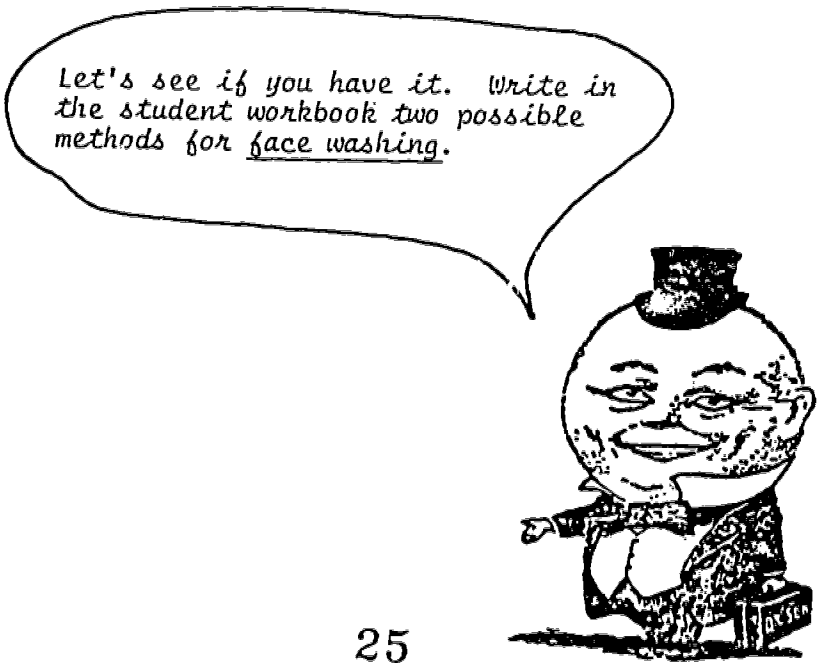
Look up.

Say, "Hello."

Wait for response.

Go back to work.

An appropriate method for a social skill is often difficult to define. The way in which a particular social behavior should be done may vary somewhat from one situation to the next. As a result, some steps which involve *judgment* of the situation may need to be taught.


Let's see if you have it. Write in the student workbook two possible methods for face washing.

25

There are, of course, many possible ways in which people wash their faces. Here are a few:

Take a minute and think about some task you may now be teaching a client to do. Are there other methods which may be simpler, easier, or better matched to the client's skills?

GOOD [?] FAIR [?] POOR [?]

CONTENT

The content is the set of steps a method is broken down into.

For example, toothbrushing might start like this:

1. Pick up toothpaste in H_2 (less preferred hand)
2. Take cap off with H_1 (preferred hand) and put cap on counter.
3. Turn on water with H_2.
4. Pick up toothbrush with H_1.
5. Etc.

The content is the set of teachable steps of a method for your particular client. Content is the part of task analysis with which most people are familiar.

The content is never complete. A step can always be broken down some more. We never say, *"he can't do this behavior,"* we say, *"I have to break it down some more for him."*

NO

He can't do this behavior!

YES

I have to break down the task into more steps!

Your client's ability to learn is only limited by your ability and time to teach. If my client couldn't do step 1 of my toothbrushing program above, I could break it down into as many more steps as he needed. *For example,* I might add:

1a *Open hand-fingers together.*

1b *Curl fingers around tub.*

1c *Squeeze hand together slightly.*

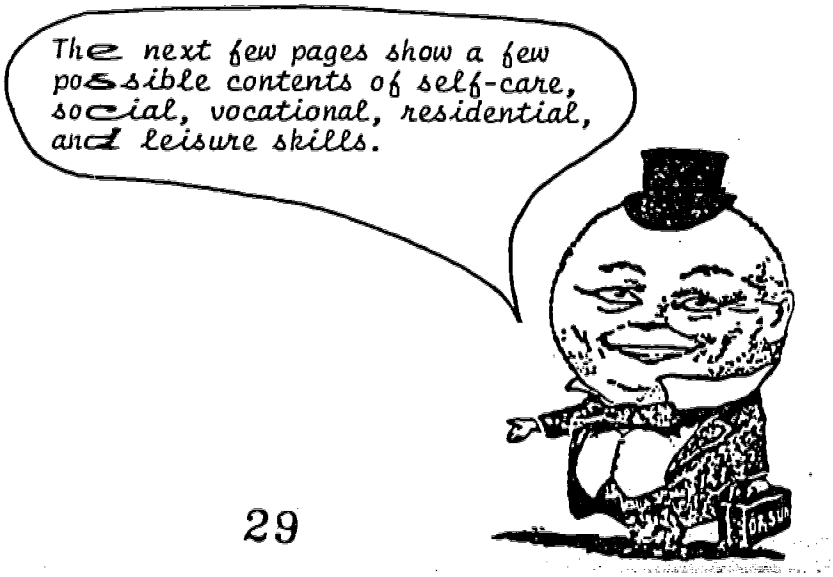
1d *Raise tube.*

Then I could go on to step 2 from the original task analysis. If he still had problems, I could add steps.

1aa *Position hand over tube.*

1ab *Lower hand to tube.*

and then go to step 1b. There is no limit to the number of times the content can be redone.



Handwashing

1. Roll up your sleeves and remove your jewelry.
2. Turn the cold water on.
3. Turn the hot water on.
4. Adjust the water to warm.
5. Wet your hands.
6. Pick up the soap.
7. Work the soap into a leather.
8. Scrub the palms and backs of your hands.
9. Scrub between your fingers.
10. Scrub your fingernails.
11. Rinse the soap from your hands.
12. Turn the water off.
13. Dry your hands.

Greeting

1 Approach to 3 feet from person.

2 Wait for person to finish talking with other people.

3 Look at person.

4 Smile.

5 Say "hello."

6 If you do not know the person, say, "I am (your name)."

7 Make one sentence of small talk (e.g., "It's a nice day.").

8 Make an offer (e.g., "would you like me to get someone?")

9 Wait for response.

10 If you do not know the person, say "Nice to meet you."

10a If you know the person, say "Nice seeing you."

11 Go back to what you were doing.

Soldering

1. Place iron on terminal.
2. Place solder at iron tip.
3. Apply 1 inch of solder.
4. Remove solder and iron.

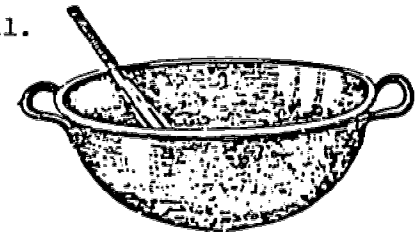
4a. If solder fills terminal, go to step 5.

4b. If solder does not fill terminal, go back to step 1.

5. Place terminal in box.

Baking a

1. Turn on oven to bake-350°.
2. Get square cake pan.
3. Smear with fingers a small amount of butter inside pan, covering bottom and sides.
4. Open box of cake mix
5. Pour mix into mixing bowl.
6. Get one egg from refrigerator.
7. Break egg over bowl, holding shell.
8. Let insides drop into mix.
9. Throw away egg shell.
10. Get measuring cup.
11. Fill measuring cup to ¼ cup-line with water.



Jiffy-Mix Cake

12 Pour water into mixing bowl.

13 Stir with big wooden spoon to mix all together.

14 Stir faster (beat) 300 times (count)

15 Pour mix into cake pan.

16 Put cake in oven to bake.

17 Bake 20 or 25 minutes

18 Get pot holders or glove mit to take cake from oven.

19 Set cake on hot pads on counter to cool.

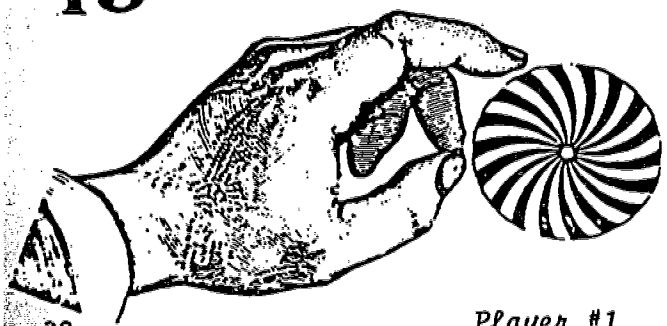
20 Wash dishes.

21 Put away clean dishes.

22 Clean off counter.

If you are writing a task analysis of an activity that involves more than one player, it may be useful to write the analysis in terms of what each person is doing. Here is one way to do this for playing catch:

1. Get out ball.
2. Put H_1 on top of ball.
3. Curl fingers around ball tightly.
4. Raise ball to shoulder height.
5. Continue backward motion of hand while grasping ball tightly.
6. When hand is approximately 6" behind head and arm forms right angle to the floor, stop.
7. Move hand with ball forward quickly, keeping ball moving in a parallel line to the floor.
8. Let go of ball.
9. Wait.
10. Wait.
11. Do steps 3-10 of player two
12. Continue alternating until time is up.
13. Wait.



Player #1

1 Wait

2 Wait

3 Wait

4 Hold hands with fingers together and little fingers of H_1 touching little fingers of H_2.

5 Wait.

6 With hands in this position move them to approximately 8" in front of self.

7 Wait.

8 Move hands still in position towards the ball.

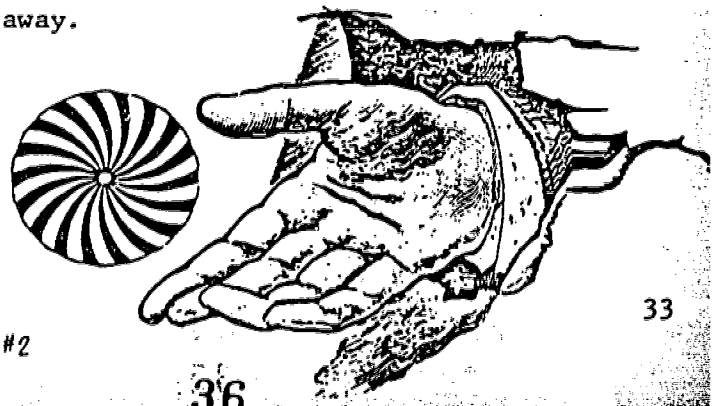
9 As ball contacts hands, curl fingers around ball tightly.

10 Transfer ball to H_1, putting hand on top of ball.

11 Do steps 3-10 of player one.

12 Continue alternating until time is up.

13 Put ball away.



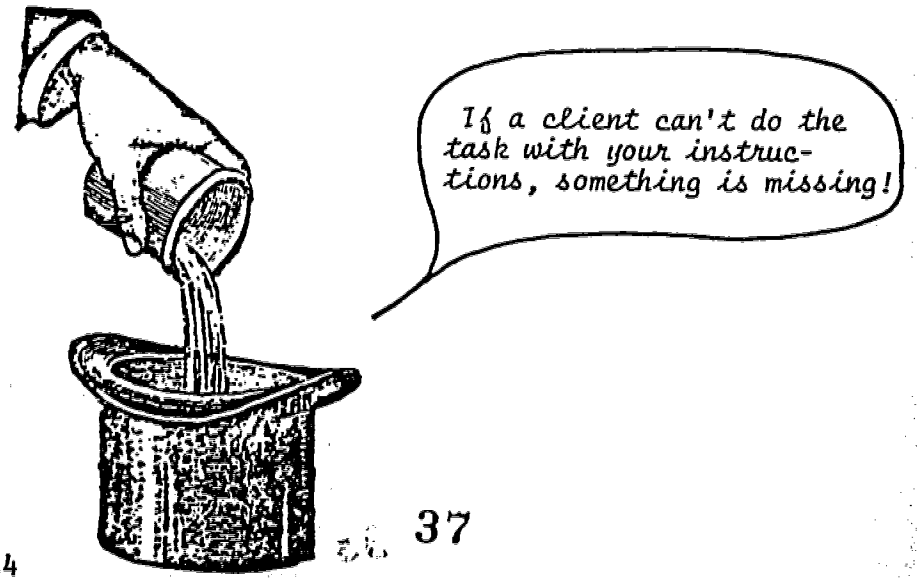
Player #2

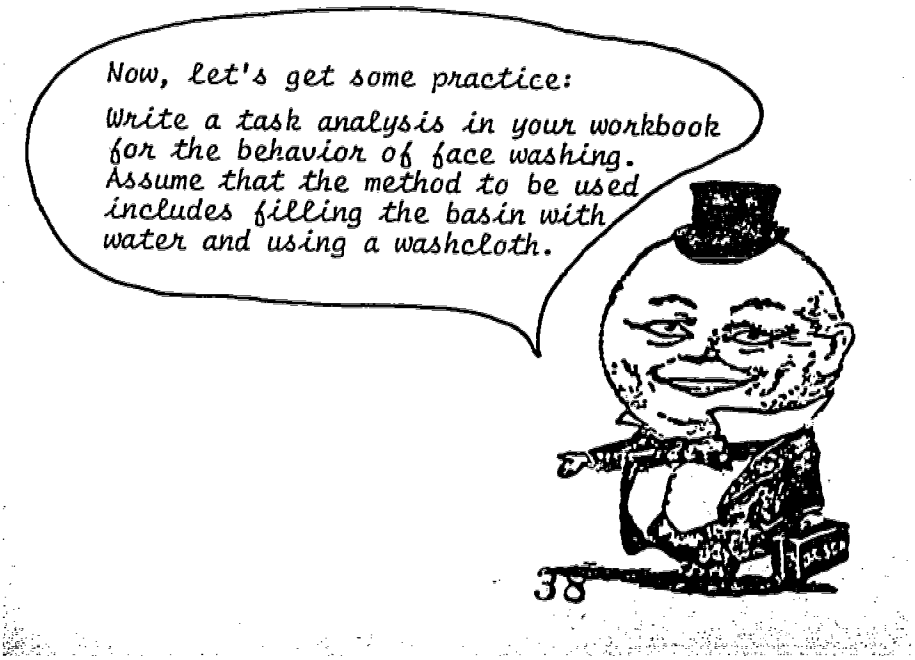
Notice that the steps in each content were similar in certain ways:

1. They were written in simple sentences with one action verb in each.

2. Completing each step set the stage for the next step.

To make sure that your content is complete and no steps are missing, a good procedure is to perform the task yourself exactly the way the worker will be expected to do it. Then read the steps off to another person who can do the task, but only have them do what you tell them. If they cannot do the task with your instructions, something is missing.

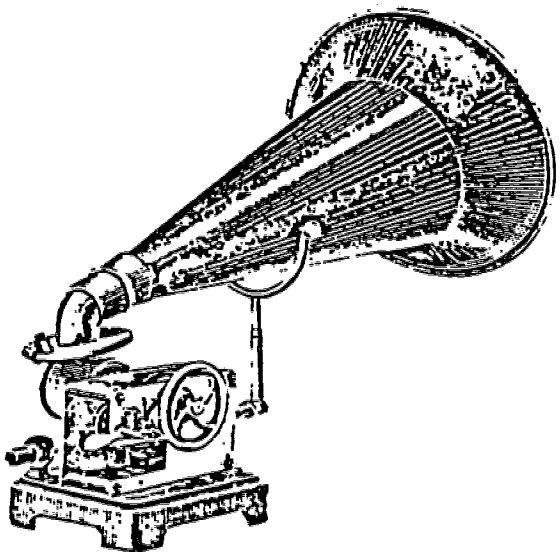



Now, let's get some practice:
Write a task analysis in your workbook for the behavior of face washing. Assume that the method to be used includes filling the basin with water and using a washcloth.

Here is a sample of what you might have written:

1. Turn on cold water.
2. Turn on hot water
3. Adjust to proper temperature.
4. Fill basin ½ full.
5. Pick up soap.
6. Pick up washcloth.
7. Put hands, washcloth, and soap in water.
8. Take hands, washcloth, and soap out of water.
9. Rub soap in cloth until it suds.
10. Put soap in tray.
11. Hold washcloth open with both hands.
12. Lightly rub so that entire face has suds.
13. Dip washcloth in water.
14. Rinse face with washcloth until all suds are go
15. Put washcloth on rack.
16. Pick up towel.
17. Wipe face until entire face is dry.
18. Put towel on rack.


How did your task analysis compare? You might have combined some steps or broken some steps into more detail. Make sure you used simple sentences with one action!



PROCESS

The process is the way in which the task is taught. It's the actual teaching of the method and content. Some people consider process to be part of task analysis. (Gold, 1976). Others feel that process is a separate issue (Bellamy et al, 1979). We have chosen to present it in detail in another module (*Teaching New Behavior*) and review it briefly here. .

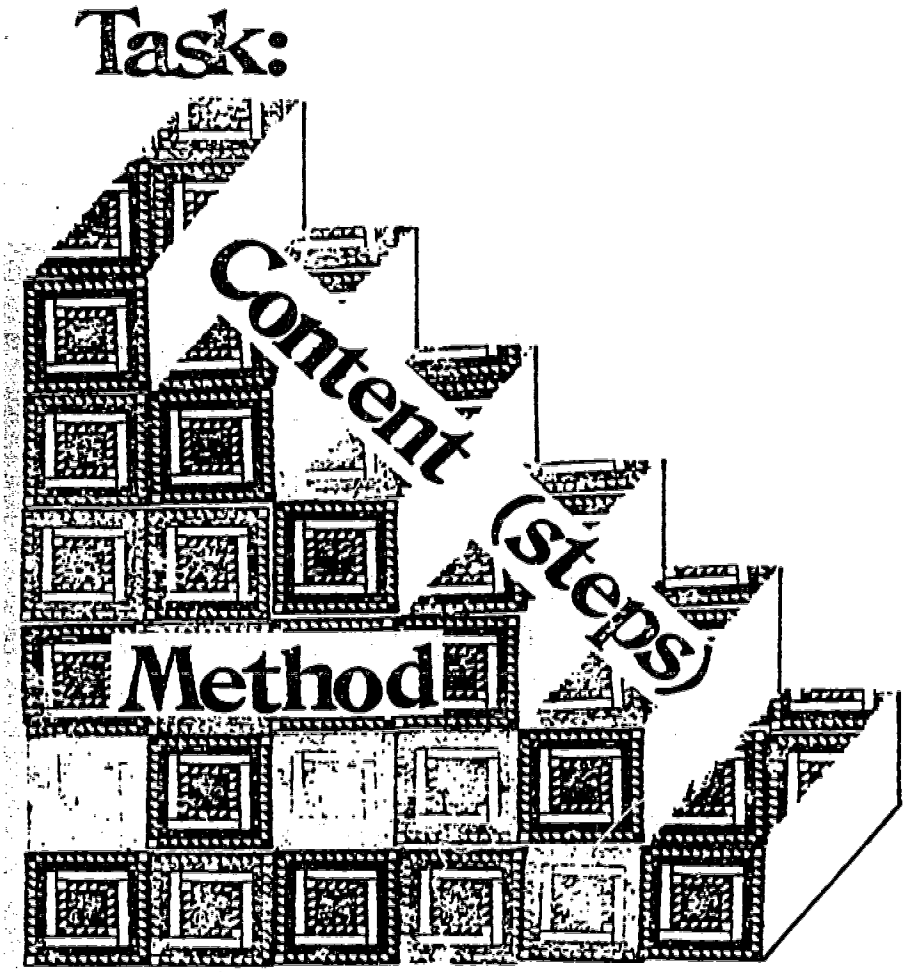
Process consists of

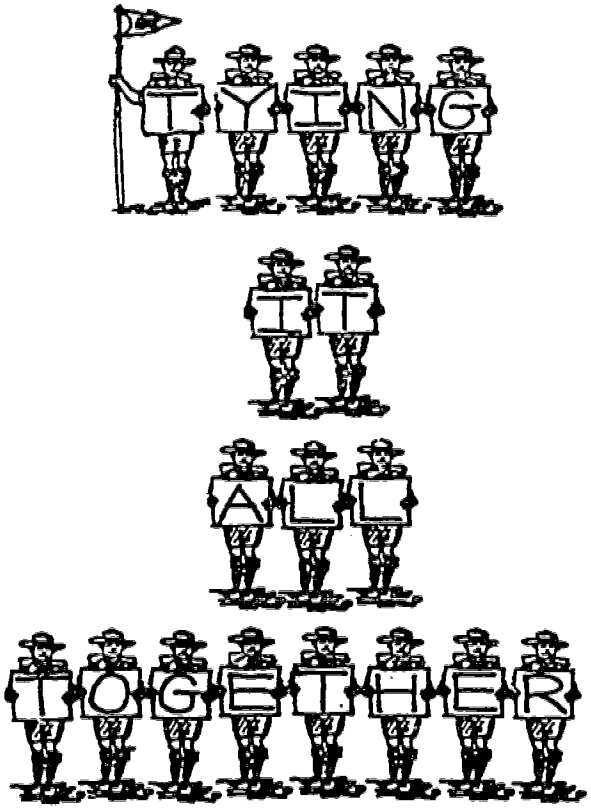
FORMAT: *The way in which the task is presented (i.e., forward chaining, backward chaining, total task).*

FEEDBACK: *Information which tells the client what to do and how well he has done it. This includes instructions, prompts, and reinforcement.*

PROCEDURE: *Additional discussion which ties the process together, Includes time and place for teaching, arrangements to enhance generalization, etc. Essentially anything which will clarify the training process.*

To further understand process, we can look at it in terms of the rest of task analysis:



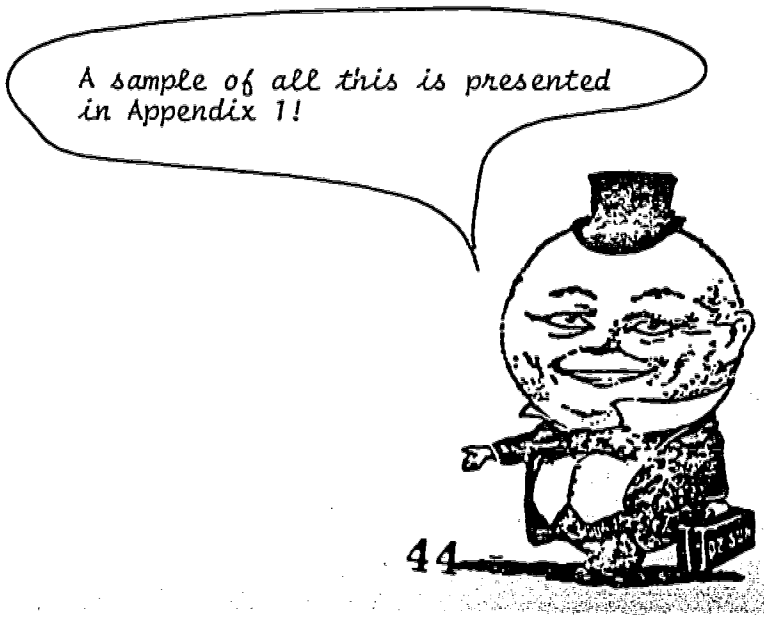

TYING
IT
ALL
TOGETHER

By now you should have a pretty good idea of what a task analysis is and how to put one together. Basic steps are

1. *Decide on a METHOD* (what is the best way for this person to do this task?)

2. *Develop CONTENT* (what clear and specific steps are involved in the chosen method for the task?)

3. *Decide on the PROCESS* (how will the content be presented (format)? What feedback will the client be given, what other procedures are involved?



There is still, however, one other thing to consider. What if your program isn't working? It could be:

You may need another method!

Maybe the content needs re-analyzed and broken down!

Maybe the format needs changed!

Maybe you aren't giving appropriate feedback!

Maybe the procedures aren't complete!

Thus, you may need to *RECYCLE!*

Re-do process

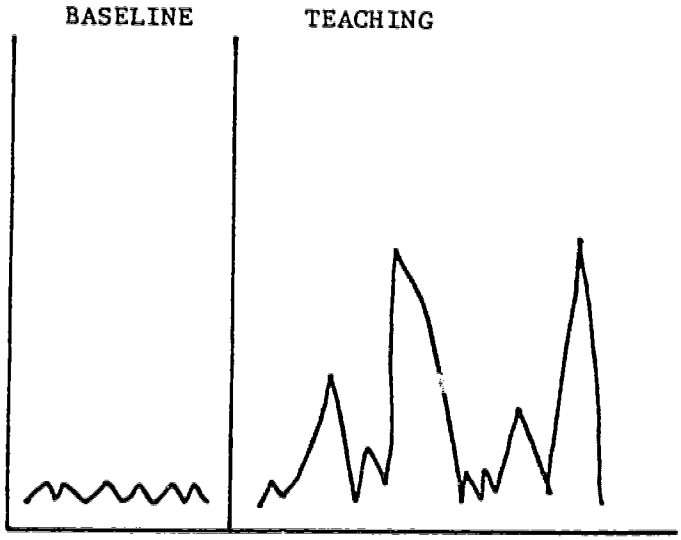
Re-do content

Re-do method

There is always one more possible method, content, or process to try before giving up!

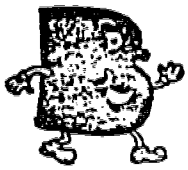
Your data can give you clues as to what, specifically, needs redone. The graphs on the following page give an idea of what various types of data might indicate.

NON-FUNCTIONAL REINFORCER

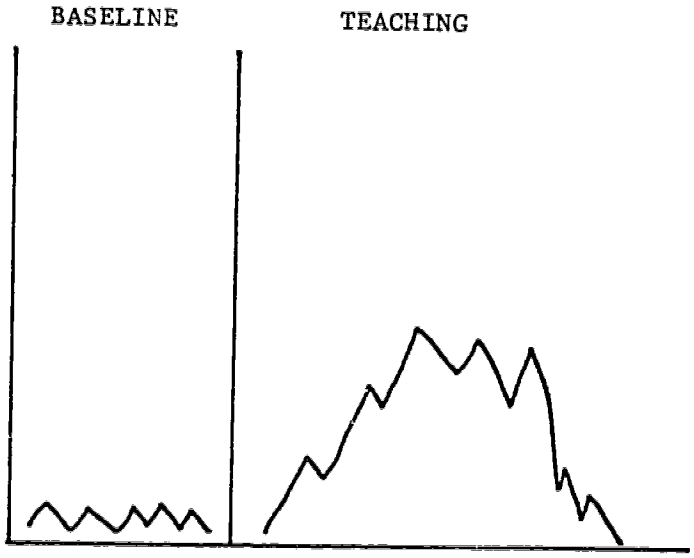


The current reinforcer is not effective every day, as indicated by the up and down pattern following baseline.

CHANGE REINFORCER OR ESTABLISH MENU



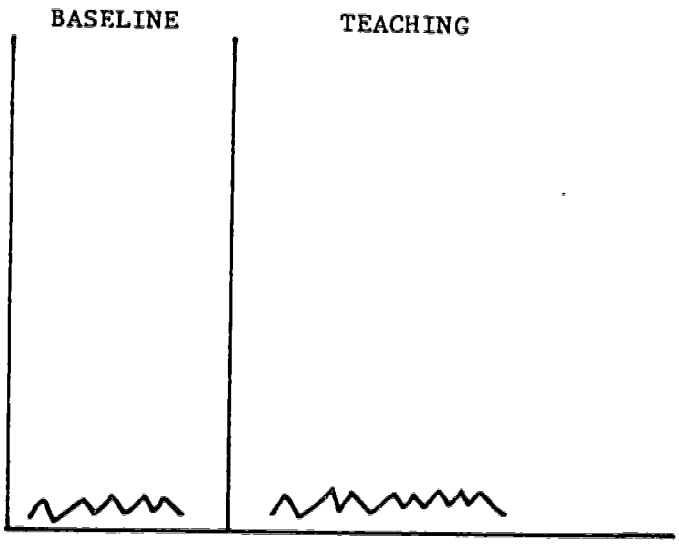
SATIATION



The reinforcer initially lead to an increase in behavior as indicated by the sharp rise following baseline, but is no longer effective as indicated by the subsequent, downward trend.

CHANGE REINFORCER OR ESTABLISH MENU

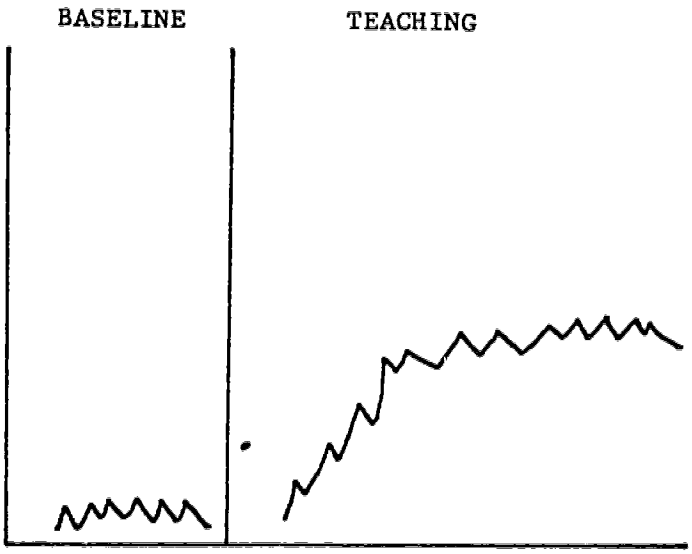
PROGRAM INAPPROPRIATE



Teaching is providing no change in behavior.

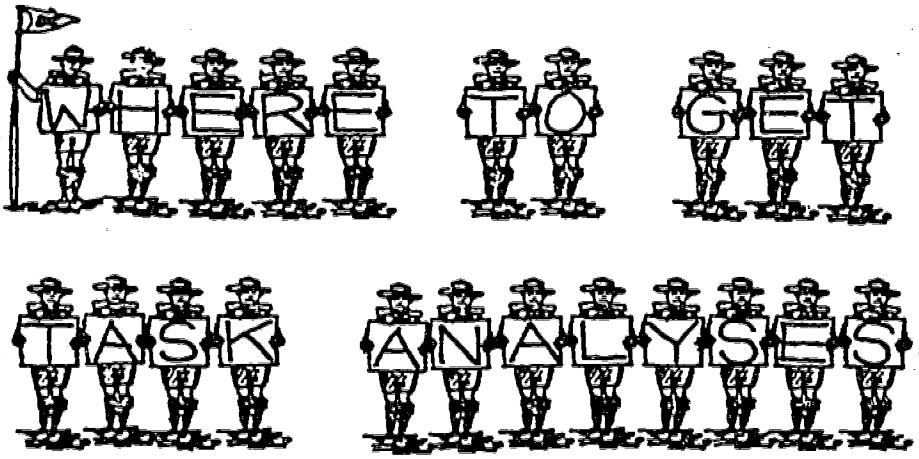
RECYCLE!

REACHED A STEP THAT IS TOO HARD



After a sharp increase, progress has leveled off.

RE-DO CONTENT FOR THAT STEP



As a final help, you may be able to obtain pre-written task analyses.

There are many sources for finding task analyses which have already been prepared. You must remember, however, *there is no such thing as a finished task analysis.* A task analysis must always be fitted to an individual client and must often be revised based on the client's performance.

Since you are doing the training, the best person to write the task analysis is you. You need to know the task so well that you can train it without constantly referring to the task analysis and program plan. However, what you can get from other sources are task analyses that give you a start on preparing your own. Whenever you get a task analysis that someone else has prepared, try following it yourself. Observe your client carefully. Then revise the task analysis to fit you and your client.

The first place to look for a task analysis is within your agency's files. Many of the tasks required or available at your facility have probably already been analyzed. If you can't find one there, check out sources of commercially available analyses. Additionally, many of the other R.A.T.E.S. modules have pre-written task-analyses in them (Production, Domestic Maintenance, Leisure Skills, etc.)

COMMERCIALLY AVAILABLE TASK ANALYSES

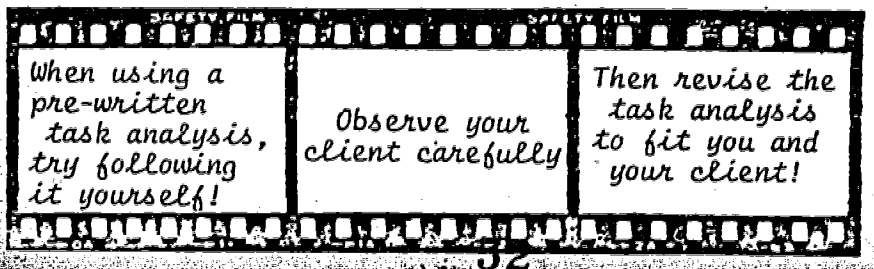
Baker, B.L., et al Steps to independence. Research Press, Box 317743, Champaign, IL 61820. Includes early, intermediate, and advanced self-help skills, behavior problems, and toilet training.

Fredericks, H.D., et al. The teaching research curriculum for moderately and severely handicapped. Charles C. Thomas, Springfield, IL. This curriculum includes gross motor and fine motor skills. It includes objectives, task analyses, and guidelines for teaching each skill. It is aimed at severely handicapped clients. A new set of task analyses is being developed for higher level skills.

Marc Gold and Associates. Task analyses developed during the California Project. 708 West Oregon Street, Urbana, IL 61801.

Project MORE. Edmark Associates, 13249 Northup Way, Bellevue, Washington 98005. Call 800-426-0856.

Sprafkin, R.P., et al. Skill training for community living: Structured learning therapy. Pergamon Press, Inc., Maxwell House, Fairview Park, Elmsford, NY 10523. These task analyses are for social skills needed by people living independently or semi-independently. Included is a set of tapes with practice vignettes, 3X5 cards with learning points (task analyses), and homework books. Procedures for training include modelling role play, feedback, and homework assignments which require performance of the social skills in natural settings.



TASK ANALYSIS NOTES

METHOD

- Way in which the target behavior is to be performed.
- Person doing training should construct program.
- Trainer should perform the task several times.

CONTENT

- Break task into teachable steps (small enough for particular client) and in a logical and effective order.
- For each step, list S^D.
- Review steps to ensure S^D's do not control different responses.
- Construct a training data sheet.

PROCESS

- Decide on format; presentation of content.
  - Single piece: matching to sample, oddity, paired associates.
  - Multiple pieces: Backward chaining, forward chaining, total task.
- Decide on feedback; how to inform learner (before, during, after)
  - Rules, imitation, stimulus control, reinforcement control, prompting, fading
- Decide on procedure; pulls together content and process
  - Few distractions
  - Closer and closer to natural situation
  - Establish criteria for success

TRAIN

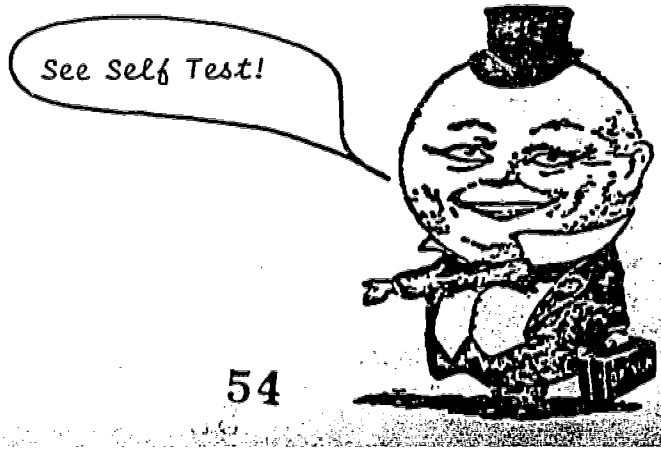
- Establish specific area to train, as natural as possible
- Shape attending
- Reinforcement
- Don't give more help than is needed

RECYCLE

- Re-do process
  . Massed practice
- Re-do content
  . Make steps easier
- Re-do method
  . Try an alternate method

WHY TASK ANALYSIS?

- Makes teaching easier
- Allows individualized instruction
- Facilitates evaluation
- Facilitates consistent training



Appen

TASK: Throwing a ball

METHOD: One hand, over-hand

CONTENT:

1. Open H_1 and spread fingers.
2. Place open hand on top of ball.
3. Curl all fingers and thumb around ball.
4. Apply pressure equally to all sides of the ball.
5. Pick up ball.
6. Walk to designated area.
7. Place feet shoulder width apart and parallel to each other.
8. Raise ball to shoulder height, bending elbow.
9. Check surroundings for people and windows.
10. When clear, push arm quickly forward until it is parallel to floor-let go of ball.
11. Walk to where ball landed.
12. Bend at waist.
13. Repeat steps 1-6 and put away, or repeat 6-12.

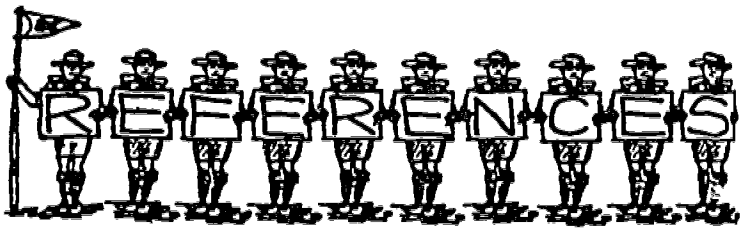
dix 1

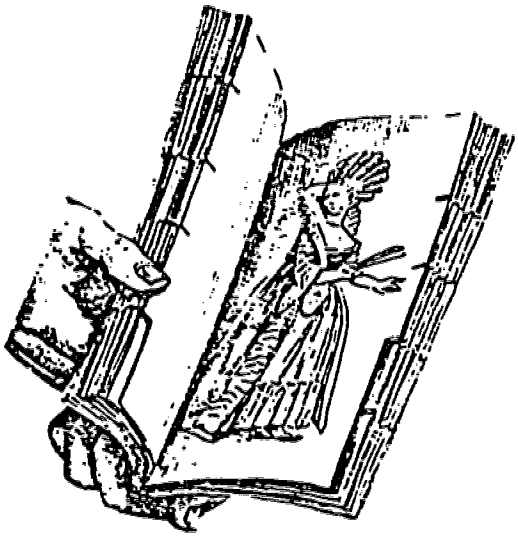
PROCESS

FORMAT: Total Task

FEEDBACK: Modelling followed by graduated guidance. Social reinforcement for correct responses.

PROCEDURE: Training in field behind workshop. Model the task three times, giving a verbal explanation of what you are doing. Follow graduated guidance procedure after allowing client to try the task twice independently. May do massed practice on holding the ball properly since this is important to the task.


REFERENCES



Bellamy, G.T., Horner, R.H., and Inman, D.P. Vocational habilitation of severely retarded adults: A direct service technology. University Park Press, 1979. Ch. 4.

Galloway, C. and Lecours, R. California Project Final Report. 1978 Selected pages. Marc Gold and Associates, P.O. Box 5100, Austin, Texas

Gold, M. An alternative definition of mental retardation, Undated.

Gold, M. Task Analysis: a statement and an example using acquisition and production of a complex assembly task by the retarded blind. Institute for Child Behavior and Development, University of Illinois at Urbana-Champaign, draft copy, 1976.

Teacher-prepared materials

FILMS

Try Another Way Training Series, Films 1 and 2. Indianapolis: Film Productions.