

Communications

New Technique for Motivating and Reinforcing Children

To the extent that motivation and reinforcement have been systematically manipulated in research with children, typically poker chips or marbles have been used as secondary reinforcers, these to be collected by the child and cashed in for a piece of candy or small toy. This method, although successful, is cumbersome and sometimes delays experimental progress while the child manipulates the token reinforcer. Also, objections from nursery-school personnel may be incurred for the reasons that (i) candy is not good for children, or (ii) toys are disruptive when taken back to the play group. Although to the experimenter these objections may appear to be of little consequence, nursery-school personnel may consider them extremely important, and the opportunity to use children often depends on the consent of a nursery-school teacher or administrator. Partly as a consequence of these problems I have developed a technique that avoids the afore-mentioned difficulties and, through its flexibility, offers a number of interesting possibilities.

The essence of at least one type of reinforcement that is useful in the control of behavior is the contingency of the continuation of a pleasant or interesting state of affairs on the occurrence of a specific bit of behavior. Thus, any situation that will entertain a child and can also be readily turned off and on would serve this purpose. Both movies and music would appear to meet these latter criterions. Although movies might be expected to be more entertaining, I had a tape recorder, rather than a projector, at hand and have used music as a reinforcer with striking success.

Children's records were transferred to tape, and a delay interval timer was placed in the earphone circuit of the tape recorder in such a way that the music is cut off at preset intervals and can be turned on at the touch of a button. Normal children as young as 3 yr of age will stay in this situation for at least 30 min while pressing a button every 10 sec to continue the music. Greater flexibility is achieved by using a foot switch under the control of the experimenter to turn on the music. This arrangement permits the reinforcement of more complex responses. For example, mentally retarded children have been taught various concepts by reinforcing the response of pointing to a particular card or object of a pair placed on a table in front of the child. Also, a speech pathologist has given and withheld reinforcement for successive approximations to the desired speech sounds. In both of these situations the rapidity of learning has been marked, and both the experimenter and the speech pathologist have been very enthusiastic about the device.

Neither a tape recorder nor interval timer would appear to be essential, but it is my guess that the ear-

phones may enhance the effect and tend to limit extraneous behavior of the child. Otherwise, a simple on-off switch in the speaker circuit of any record changer would probably serve if the actual control of the music is to be left to the experimenter. Certainly a variety of other arrangements is also possible.

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Bonding in the Lanthanon Chelates

A criterion proposed by C. W. Davies (1) to distinguish between essentially ionic bonding and covalent bonding in electrolytes may be utilized to obtain information on the nature of the lanthanon chelates. The criterion proposed by Davies consists of two parts: (i) The behavior of alkalis and heavy alkaline earths is typically ionic. (ii) The logarithms of the ionization constants (in this case of the instability constants) will be directly proportional to the square of the ionic charge Z and inversely proportional to the ionic radius r . Although the application of the second part of this criterion to lanthanon complexes has been discussed (2-4) using data on two or three of the lighter lanthanons, a lack of experimental data has previously prevented its strict application to the lanthanons as a whole.

In Fig. 1 this criterion is applied to the data of

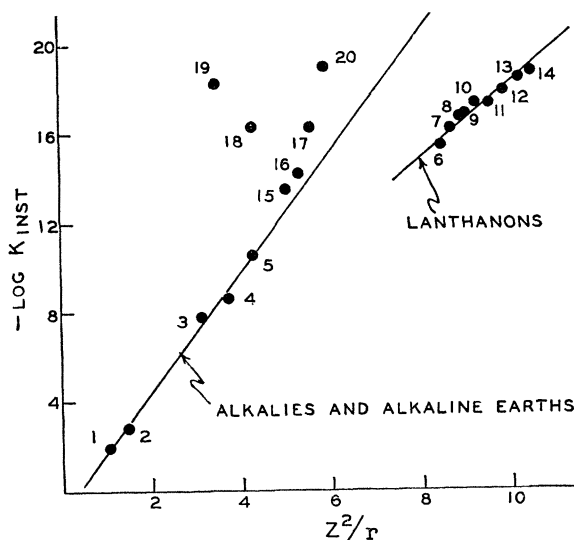


Fig. 1. Relationship between the logarithm of the instability constants and Z^2/r for metal chelates with ethylenediamine tetraacetic acid. (1) Na^+ , (2) Li^+ , (3) Ba^{+2} , (4) Sr^{+2} , (5) Ca^{+2} , (6) La^{+3} , (7) Ce^{+3} , (8) Pr^{+3} , (9) Nd^{+3} , (10) Sm^{+3} , (11) Gd^{+3} , (12) Dy^{+3} , (13) Er^{+3} , (14) Yb^{+3} , (15) Mn^{+2} , (16) Fe^{+2} , (17) Co^{+2} , (18) Cd^{+2} , (19) Pb^{+2} , (20) Ni^{+2} .