PSYCHOLOGY OF LEARNING

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LEARNING

- WHAT IS LEARNING?
- CLASSICAL CONDITIONING
- OPERANT CONDITIONING
- OBSERVATIONAL LEARNING (MODELING)

BOTH INSTINCTS AND REFLEXES ARE INNATE BEHAVIORS THAT ORGANISMS ARE BORN WITH. REFLEXES ARE A MOTOR OR NEURAL REACTION TO A SPECIFIC STIMULUS IN THE ENVIRONMENT. THEY TEND TO BE SIMPLER THAN INSTINCTS, INVOLVE THE ACTIVITY OF SPECIFIC BODY PARTS AND SYSTEMS (E.G., THE KNEE-JERK REFLEX), AND INVOLVE MORE PRIMITIVE CENTERS OF THE CENTRAL NERVOUS SYSTEM (E.G., THE SPINAL CORD AND THE MEDULLA).

IN CONTRAST, INSTINCTS ARE INNATE BEHAVIORS THAT ARE TRIGGERED BY A BROADER RANGE OF EVENTS, SUCH AS AGING AND THE CHANGE OF SEASONS. THEY ARE MORE COMPLEX PATTERNS OF BEHAVIOR; INVOLVE MOVEMENT OF THE ORGANISM AS A WHOLE (E.G., SEXUAL ACTIVITY AND MIGRATION), AND INVOLVE HIGHER BRAIN CENTERS.

BOTH REFLEXES AND INSTINCTS HELP AN ORGANISM ADAPT TO ITS ENVIRONMENT AND DO NOT HAVE TO BE LEARNED. FOR EXAMPLE, EVERY HEALTHY HUMAN BABY HAS A SUCKING REFLEX, PRESENT AT BIRTH.

LEARNING, LIKE REFLEXES AND INSTINCTS, ALLOWS AN ORGANISM TO ADAPT TO ITS ENVIRONMENT. BUT UNLIKE INSTINCTS AND REFLEXES, LEARNED BEHAVIORS INVOLVE CHANGE AND EXPERIENCE: LEARNING IS A RELATIVELY PERMANENT CHANGE IN BEHAVIOR OR KNOWLEDGE THAT RESULTS FROM EXPERIENCE.

IN CONTRAST TO THE INNATE BEHAVIORS DISCUSSED ABOVE, LEARNING INVOLVES ACQUIRING KNOWLEDGE AND SKILLS THROUGH EXPERIENCE.

LEARNING INVOLVES A COMPLEX INTERACTION OF CONSCIOUS AND UNCONSCIOUS PROCESSES.

CLASSICAL CONDITIONING

CLASSICAL CONDITIONING IS A PROCESS BY WHICH WE LEARN TO ASSOCIATE STIMULI AND, CONSEQUENTLY, TO ANTICIPATE EVENTS.

PAVLOV (1849–1936), A RUSSIAN SCIENTIST, PERFORMED EXTENSIVE RESEARCH ON DOGS AND IS BEST KNOWN FOR HIS EXPERIMENTS IN CLASSICAL CONDITIONING.

IN HIS STUDIES WITH DOGS, PAVLOV SURGICALLY IMPLANTED TUBES INSIDE DOGS' CHEEKS TO COLLECT SALIVA. HE THEN MEASURED THE AMOUNT OF SALIVA PRODUCED IN RESPONSE TO VARIOUS FOODS. OVER TIME, PAVLOV (1927) OBSERVED THAT THE DOGS BEGAN TO SALIVATE NOT ONLY AT THE TASTE OF FOOD, BUT ALSO AT THE SIGHT OF FOOD, AT THE SIGHT OF AN EMPTY FOOD BOWL, AND EVEN AT THE SOUND OF THE LABORATORY ASSISTANTS' FOOTSTEPS.

SALIVATING TO FOOD IN THE MOUTH IS REFLEXIVE, SO NO LEARNING IS INVOLVED. HOWEVER, DOGS DON'T NATURALLY SALIVATE AT THE SIGHT OF AN EMPTY BOWL OR THE SOUND OF FOOTSTEPS. TO EXPLORE THIS PHENOMENON IN AN OBJECTIVE MANNER, PAVLOV DESIGNED A SERIES OF CAREFULLY CONTROLLED EXPERIMENTS TO SEE WHICH STIMULI WOULD CAUSE THE DOGS TO SALIVATE.

HE WAS ABLE TO TRAIN THE DOGS TO SALIVATE IN RESPONSE TO STIMULI THAT CLEARLY HAD NOTHING TO DO WITH FOOD, SUCH AS THE SOUND OF A BELL, A LIGHT, AND A TOUCH ON THE LEG. THROUGH HIS EXPERIMENTS, PAVLOV REALIZED THAT AN ORGANISM HAS TWO TYPES OF RESPONSES TO ITS ENVIRONMENT: (1) UNCONDITIONED (UNLEARNED) RESPONSES, OR REFLEXES, AND (2) CONDITIONED (LEARNED) RESPONSES.

IN PAVLOV'S EXPERIMENTS, THE DOGS SALIVATED EACH TIME MEAT POWDER WAS PRESENTED TO THEM. THE MEAT POWDER IN THIS SITUATION WAS AN UNCONDITIONED STIMULUS (UCS): A STIMULUS THAT ELICITS A REFLEXIVE RESPONSE IN AN ORGANISM. THE DOGS' SALIVATION WAS AN UNCONDITIONED RESPONSE (UCR): A NATURAL (UNLEARNED) REACTION TO A GIVEN STIMULUS. BEFORE CONDITIONING, THINK OF THE DOGS' STIMULUS AND RESPONSE LIKE THIS:

MEAT POWDER (UCS) → SALIVATION (UCR)

IN CLASSICAL CONDITIONING, A NEUTRAL STIMULUS IS PRESENTED IMMEDIATELY BEFORE AN UNCONDITIONED STIMULUS. PAVLOV WOULD SOUND A TONE (LIKE RINGING A BELL) AND THEN GIVE THE DOGS THE MEAT POWDER. THE TONE WAS THE NEUTRAL STIMULUS (NS), WHICH IS A STIMULUS THAT DOES NOT NATURALLY ELICIT A RESPONSE. PRIOR TO CONDITIONING, THE DOGS DID NOT SALIVATE WHEN THEY JUST HEARD THE TONE BECAUSE THE TONE HAD NO ASSOCIATION FOR THE DOGS.

QUITE SIMPLY THIS PAIRING MEANS:

TONE (NS) + MEAT POWDER (UCS) → SALIVATION (UCR)

WHEN PAVLOV PAIRED THE TONE WITH THE MEAT POWDER OVER AND OVER AGAIN, THE PREVIOUSLY NEUTRAL STIMULUS (THE TONE) ALSO BEGAN TO ELICIT SALIVATION FROM THE DOGS. THUS, THE NEUTRAL STIMULUS BECAME THE CONDITIONED STIMULUS (CS), WHICH IS A STIMULUS THAT ELICITS A RESPONSE AFTER REPEATEDLY BEING PAIRED WITH AN UNCONDITIONED STIMULUS.

EVENTUALLY, THE DOGS BEGAN TO SALIVATE TO THE TONE ALONE, JUST AS THEY PREVIOUSLY HAD SALIVATED AT THE SOUND OF THE ASSISTANTS' FOOTSTEPS. THE BEHAVIOR CAUSED BY THE **CONDITIONED STIMULUS** IS CALLED THE **CONDITIONED RESPONSE (CR)**. IN THE CASE OF PAVLOV'S DOGS, THEY HAD LEARNED TO ASSOCIATE THE TONE (CS) WITH BEING FED, AND THEY BEGAN TO SALIVATE (CR) IN ANTICIPATION OF FOOD.

TONE (CS) → SALIVATION (CR)

IN CLASSICAL CONDITIONING, THE INITIAL PERIOD OF LEARNING IS KNOWN AS **ACQUISITION**, WHEN AN ORGANISM LEARNS TO CONNECT A NEUTRAL STIMULUS AND AN UNCONDITIONED STIMULUS. DURING ACQUISITION, THE NEUTRAL STIMULUS BEGINS TO ELICIT THE CONDITIONED RESPONSE, AND EVENTUALLY THE NEUTRAL STIMULUS BECOMES A CONDITIONED STIMULUS CAPABLE OF ELICITING THE CONDITIONED RESPONSE BY ITSELF.

PAVLOV EXPLORED IN HIS EXPERIMENTS WITH DOGS THE FOLLOWING SCENARIO: SOUNDING THE TONE WITHOUT GIVING THE DOGS THE MEAT POWDER. SOON THE DOGS STOPPED RESPONDING TO THE TONE. **EXTINCTION** IS THE DECREASE IN THE CONDITIONED RESPONSE WHEN THE UNCONDITIONED STIMULUS IS NO LONGER PRESENTED WITH THE CONDITIONED STIMULUS. WHEN PRESENTED WITH THE CONDITIONED STIMULUS ALONE, THE DOG, CAT, OR OTHER ORGANISM WOULD SHOW A WEAKER AND WEAKER RESPONSE, AND FINALLY NO RESPONSE.

TWO OTHER LEARNING **PROCESSES—STIMULUS DISCRIMINATION AND STIMULUS GENERALIZATION**—ARE INVOLVED IN DISTINGUISHING WHICH STIMULI WILL TRIGGER THE LEARNED ASSOCIATION. ANIMALS (INCLUDING HUMANS) NEED TO DISTINGUISH BETWEEN STIMULI—FOR EXAMPLE, BETWEEN SOUNDS THAT PREDICT A THREATENING EVENT AND SOUNDS THAT DO NOT—SO THAT THEY CAN RESPOND APPROPRIATELY (SUCH AS RUNNING AWAY IF THE SOUND IS THREATENING).

WHEN AN ORGANISM LEARNS TO RESPOND DIFFERENTLY TO VARIOUS STIMULI THAT ARE SIMILAR, IT IS CALLED **STIMULUS DISCRIMINATION**. IN CLASSICAL CONDITIONING TERMS, THE ORGANISM DEMONSTRATES THE CONDITIONED RESPONSE ONLY TO THE CONDITIONED STIMULUS.

ON THE OTHER HAND, WHEN AN ORGANISM DEMONSTRATES THE CONDITIONED RESPONSE TO STIMULI THAT ARE SIMILAR TO THE CONDITION STIMULUS, IT IS CALLED **STIMULUS GENERALIZATION**, THE OPPOSITE OF STIMULUS DISCRIMINATION.

SOMETIMES, CLASSICAL CONDITIONING CAN LEAD TO HABITUATION. HABITUATION OCCURS WHEN WE LEARN NOT TO RESPOND TO A STIMULUS THAT IS PRESENTED REPEATEDLY WITHOUT CHANGE. AS THE STIMULUS OCCURS OVER AND OVER, WE LEARN NOT TO FOCUS OUR ATTENTION ON IT.

OPERANT CONDITIONING

IN OPERANT CONDITIONING, ORGANISMS LEARN TO ASSOCIATE A BEHAVIOR AND ITS CONSEQUENCE. A PLEASANT CONSEQUENCE MAKES THAT BEHAVIOR MORE LIKELY TO BE REPEATED IN THE FUTURE. FOR EXAMPLE, SPIRIT, A DOLPHIN AT THE NATIONAL AQUARIUM IN BALTIMORE, DOES A FLIP IN THE AIR WHEN HER TRAINER BLOWS A WHISTLE. THE CONSEQUENCE IS THAT SHE GETS A FISH.

	Classical Conditioning	Operant Conditioning
Conditioning approach	An unconditioned stimulus (such as food) is paired with a neutral stimulus (such as a bell). The neutral stimulus eventually becomes the conditioned stimulus, which brings about the conditioned response (salivation).	The target behavior is followed by reinforcement or punishment to either strengthen or weaken it, so that the learner is more likely to exhibit the desired behavior in the future
Stimulus timing	The stimulus occurs immediately before the response.	The stimulus (either reinforcement or punishment) occurs soon after the response.

PSYCHOLOGIST B. F. SKINNER SAW THAT CLASSICAL CONDITIONING IS LIMITED TO EXISTING BEHAVIORS THAT ARE REFLEXIVELY ELICITED, AND IT DOESN'T ACCOUNT FOR NEW BEHAVIORS SUCH AS RIDING A BIKE. HE PROPOSED A THEORY ABOUT HOW SUCH BEHAVIORS COME ABOUT. SKINNER BELIEVED THAT BEHAVIOR IS MOTIVATED BY THE CONSEQUENCES WE RECEIVE FOR THE BEHAVIOR: THE REINFORCEMENTS AND PUNISHMENTS.

HIS IDEA THAT LEARNING IS THE RESULT OF CONSEQUENCES IS BASED ON THE LAW OF EFFECT. ACCORDING TO THE LAW OF EFFECT, BEHAVIORS THAT ARE FOLLOWED BY CONSEQUENCES THAT ARE SATISFYING TO THE ORGANISM ARE MORE LIKELY TO BE REPEATED, AND BEHAVIORS THAT ARE FOLLOWED BY UNPLEASANT CONSEQUENCES ARE LESS LIKELY TO BE REPEATED (THORNDIKE, 1911).

ESSENTIALLY, IF AN ORGANISM DOES SOMETHING THAT BRINGS ABOUT A DESIRED RESULT, THE ORGANISM IS MORE LIKELY TO DO IT AGAIN. IF AN ORGANISM DOES SOMETHING THAT DOES NOT BRING ABOUT A DESIRED RESULT, THE ORGANISM IS LESS LIKELY TO DO IT AGAIN.

REINFORCEMENT

THE MOST EFFECTIVE WAY TO TEACH A PERSON OR ANIMAL A NEW BEHAVIOR IS WITH POSITIVE REINFORCEMENT. IN POSITIVE REINFORCEMENT, A DESIRABLE STIMULUS IS ADDED TO INCREASE A BEHAVIOR. FOR EXAMPLE, YOU TELL A FIVE-YEAR-OLD BOY, THAT IF HE CLEANS HIS ROOM, HE WILL GET A TOY. HE QUICKLY CLEANS HIS ROOM. IN FACT WE ARE CONSTANTLY AND CONSISTENTLY REWARDED IN OUR LIVES.

OUR PAYCHECKS ARE REWARDS, AS ARE HIGH GRADES AND ACCEPTANCE INTO OUR PREFERRED SCHOOL. BEING PRAISED FOR DOING A GOOD JOB AND FOR PASSING A DRIVER'S TEST IS ALSO A REWARD. POSITIVE REINFORCEMENT AS A LEARNING TOOL IS EXTREMELY EFFECTIVE.

IN NEGATIVE REINFORCEMENT, AN UNDESIRABLE STIMULUS IS REMOVED TO INCREASE A BEHAVIOR. FOR EXAMPLE, CAR MANUFACTURERS USE THE PRINCIPLES OF NEGATIVE REINFORCEMENT IN THEIR SEATBELT SYSTEMS, WHICH GO "BEEP, BEEP, BEEP" UNTIL YOU FASTEN YOUR SEATBELT. THE ANNOYING SOUND STOPS WHEN YOU EXHIBIT THE DESIRED BEHAVIOR, INCREASING THE LIKELIHOOD THAT YOU WILL BUCKLE UP IN THE FUTURE.

PUNISHMENT

MANY PEOPLE CONFUSE NEGATIVE REINFORCEMENT WITH PUNISHMENT IN OPERANT CONDITIONING, BUT THEY ARE TWO VERY DIFFERENT MECHANISMS. REMEMBER THAT REINFORCEMENT, EVEN WHEN IT IS NEGATIVE, ALWAYS INCREASES A BEHAVIOR. IN CONTRAST, PUNISHMENT ON THE OTHER HAND ALWAYS DECREASES A BEHAVIOR. IN POSITIVE PUNISHMENT, YOU ADD AN UNDESIRABLE STIMULUS TO DECREASE A BEHAVIOR.

AN EXAMPLE OF **POSITIVE PUNISHMENT** IS SCOLDING A STUDENT TO GET THE STUDENT TO STOP TEXTING IN CLASS. IN THIS CASE, A STIMULUS (THE REPRIMAND) IS ADDED IN ORDER TO DECREASE THE BEHAVIOR (TEXTING IN CLASS). IN **NEGATIVE PUNISHMENT**, YOU REMOVE A PLEASANT STIMULUS TO DECREASE A BEHAVIOR. FOR EXAMPLE, A DRIVER MIGHT BLAST HER HORN WHEN A LIGHT TURNS GREEN, AND CONTINUE BLASTING THE HORN UNTIL THE CAR IN FRONT MOVES.

OBSERVATIONAL LEARNING (MODELING)

IN OBSERVATIONAL LEARNING, WE LEARN BY WATCHING OTHERS AND THEN IMITATING, OR MODELING, WHAT THEY DO OR SAY. THE INDIVIDUALS PERFORMING THE IMITATED BEHAVIOR ARE CALLED MODELS.

STEPS IN THE MODELING PROCESS

OF COURSE, WE DON'T LEARN A BEHAVIOR SIMPLY BY OBSERVING A MODEL. BANDURA DESCRIBED SPECIFIC STEPS IN THE PROCESS OF MODELING THAT MUST BE FOLLOWED IF LEARNING IS TO BE SUCCESSFUL: ATTENTION, RETENTION, REPRODUCTION, AND MOTIVATION. FIRST, YOU MUST BE FOCUSED ON WHAT THE MODEL IS DOING—YOU HAVE TO PAY ATTENTION.

NEXT, YOU MUST BE ABLE TO RETAIN, OR REMEMBER, WHAT YOU OBSERVED; THIS IS RETENTION. THEN, YOU MUST BE ABLE TO PERFORM THE BEHAVIOR THAT YOU OBSERVED AND COMMITTED TO MEMORY; THIS IS REPRODUCTION. FINALLY, YOU MUST HAVE MOTIVATION. YOU NEED TO WANT TO COPY THE BEHAVIOR, AND WHETHER OR NOT YOU ARE MOTIVATED DEPENDS ON WHAT HAPPENED TO THE MODEL.

IF YOU SAW THAT THE MODEL WAS REINFORCED FOR HER BEHAVIOR, YOU WILL BE MORE MOTIVATED TO COPY HER. THIS IS KNOWN AS **VICARIOUS REINFORCEMENT**. ON THE OTHER HAND, IF YOU OBSERVED THE MODEL BEING PUNISHED, YOU WOULD BE LESS MOTIVATED TO COPY HER. THIS IS CALLED **VICARIOUS PUNISHMENT**.

PROSOCIAL (POSITIVE) MODELS CAN BE USED TO ENCOURAGE SOCIALLY ACCEPTABLE BEHAVIOR. PARENTS IN PARTICULAR SHOULD TAKE NOTE OF THIS FINDING. IF YOU WANT YOUR CHILDREN TO READ, THEN READ TO THEM. LET THEM SEE YOU READING.

THANK YOU FOR ATTENTION