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Defense Mechanisms: 40 Years of Empirical Research

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This article reviews research on defense mechanisms carried out over the past 40 years with children, adolescents, adults, and psychiatric patients. Both experimental and observational studies are included.

To begin, let me describe the six strands in my professional history that led me to the study of defense mechanisms. First, when I was an undergraduate psychology major at the University of California (UC), Berkeley, I was fortunate enough to participate in the personality assessments that were carried out at the Institute of Personality and Research. The staff, at that time, included Jack Block, Harrison Gough, Frank Barron, Donald MacKinnon, and Ravenna Helson, among others. During that period, the Institute was engaged in weekend-long studies of creative individuals, such as William Carlos Williams, Truman Capote, Jessamyn West, and other highly creative writers. These weekends included formal assessment procedures and informal interaction with the participants, followed by a series of observational ratings made by staff at the conclusion of each weekend. This was my exciting introduction to personality assessment.

Second, I did my graduate study at New York University, in a clinical program that at that time was strongly psychoanalytically oriented. I was an assistant at the Research Center for Mental Health, which was engaged in empirical studies of psychoanalytic concepts. My professors included Robert Holt, George Klein, and for one special year, David Rapaport, with whom I had a weekly, individual tutorial to study psychoanalytic theory. One focus of this study was Chapter 7 of Freud's *Interpretation of Dreams*, which presented an associative network model of thinking, in which the activation of one idea would spread to other related ideas.

This led to the third strand in my professional development. My doctoral dissertation was based on this idea of an associative network. Importantly, this kind of mental activity occurred outside of awareness, as is the case for defense mechanisms. My dissertation was a study of priming, demonstrating

the spread of activation within predetermined associative networks. This work was published in the *Journal of Personality and Social Psychology* in 1965 as "The Recovery of a Discrete Memory," and it is, I believe, the first published study of priming.

The fourth strand also comes from the time I was a graduate student. During the summers, I worked at Harvard University, doing research with Henry Murray and Kenneth Keniston. My job was to study the Thematic Apperception Test (TAT) stories of alienated Harvard men, to detect recurrent themes in the stories, with an eye to using these themes to develop an alienation questionnaire. This was my first experience with the TAT and its possibilities, to be followed by formal study with Robert Holt at New York University.

The fifth strand occurred post-PhD, when I began doing research on the cognitive associative processes of priming and semantic generalization. I came to realize that I needed more background and competence for conducting experimental research in cognitive psychology. To that end, I began postdoctoral study at the Institute of Human Learning, UC Berkeley, which was a major center for cognitive research at that time, under the guidance of Leo Postman. From that experience, I spent the next 10 years carrying out and publishing cognitive research, in the *Journal of Experimental Psychology* and *Memory and Cognition*, for which I was a Consulting Editor.

After 5 years at Berkeley, alternating my postdoctoral responsibilities with teaching, I began the sixth strand. Along with a continuing part-time clinical practice and clinical supervisory positions, my academic niche became the lifelong teaching of developmental psychology. In this endeavor, my thinking about psychological development was informed by the work of Jean Piaget and his theory that different cognitive operations are characteristic of different periods of child development, and by the work of Rene Spitz, describing, from a psychoanalytic point of view, how very early mental concepts develop. My course offerings included classes on both normal and disordered development in children.

These are the six strands that led to my study of the development of defense mechanisms: learning about personality assessment, the study of psychoanalytic concepts, the investigation of mental processes that occur outside of awareness,

Editor's Note: On March, 20, 2014, Dr. Phebe Cramer was given the 2014 Bruno Klopfer Award by the Society for Personality Assessment. This award is given to an individual for his or her lifetime achievements in the study of personality assessment. Dr. Cramer's article is an adaptation of her lecture.

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the exposure to the TAT, the acquisition of competence for experimental study of cognitive processes, and finally, all of these located in the framework of psychological development.

These strands all coalesced into the study of defense mechanisms as unconscious, cognitive operations that change across developmental periods, that have a protective function, and that can be studied using both methods of personality assessment and experimental paradigms.

A THEORETICAL MODEL OF DEFENSE MECHANISM DEVELOPMENT

My study of defense mechanisms began in 1972. I read extensively in the psychoanalytic literature about defenses and defense development. Both Anna Freud (1936) and Rene Spitz (1961, 1965) believed, in theory, that defense mechanisms emerged in a consistent, developmental pattern. However, their attempts to order defenses chronologically were not pursued. Other psychoanalytic writers had also suggested that there might be a theoretical hierarchy of defense development, but there was no empirical test of this idea.

The working definition of the concept of defense mechanism that I proposed is shown in Table 1. In addition, I formulated two propositions: First, different defenses are characteristic of different periods of development. Second, each defense will have its own trajectory of development, emerging and becoming predominant at one period and then becoming less important, followed by the emergence and increasing importance of a new defense, with the process again repeated for yet another new defense.

Then, I devised a theoretical model, including three defenses, as shown in Figure 1. Early in life, denial is a prominent defense. As the young child grows older, the use of denial decreases, and the use of projection, a more cognitively complex defense, increases. Projection remains predominant during late childhood, decreasing somewhat in late adolescence. At that time, the more cognitively complex defense of identification, which has been slowly developing since childhood, becomes predominant.

Wishing to test this theory, I quickly discovered that there were no appropriate methods available for studying children's use of defenses. That became my first project.

CREATING A METHOD TO ASSESS DEFENSE MECHANISMS

Over the next 10 years, I explored several possible approaches to this end. Eventually, I settled on the use of TAT stories, and developed a coding system that could assess the use of the three defenses that I had hypothesized were characteristic of three different periods of child development. Denial is the failure to see, recognize, or understand the existence or

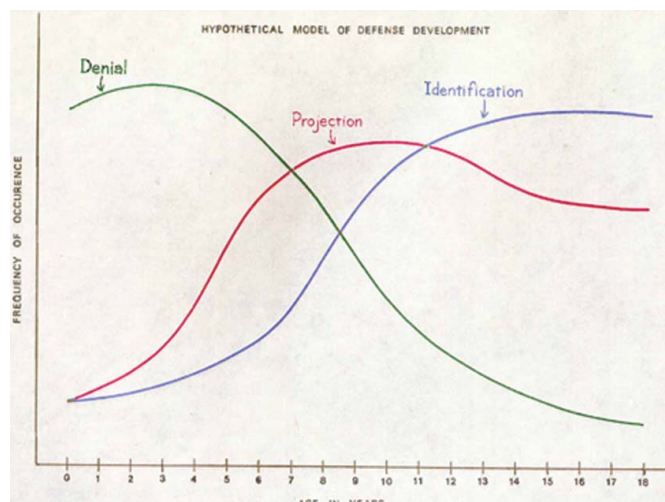


FIGURE 1.—Hypothetical model of defense development.

meaning of an internal or external stimulus; projection is attributing to others one's own unacceptable thoughts, feelings, or intentions; and identification is taking as one's own internalized thoughts, belief, values, or behaviors of another. These three defenses guided the development of the coding system for the Defense Mechanism Manual (DMM). For each defense, there are seven manifestations of the defense that can be used to code the presence of that defense (see Table 2).

Here are some example stories from children that illustrate the use of the three defenses. Each of these stories was told to TAT Card 17BM, which depicts a man clinging to a rope. Examples of defense use are italicized.

TABLE 2.—Defense mechanism manual scoring categories: Denial, projection, identification.

Denial	
(1)	Omission of major characters or objects
(2)	Misperception
(3)	Reversal
(4)	Statements of negation
(5)	Denial of reality
(6)	Overly maximizing the positive or minimizing the negative
(7)	Unexpected goodness, optimism, positiveness, or gentleness
Projection	
(1)	Attribution of hostile feelings or intentions, or other normatively unusual feelings or intentions, to a character
(2)	Additions of ominous people, animals, objects, or qualities
(3)	Magical or autistic thinking
(4)	Concern for protection from external threat
(5)	Apprehensiveness of death, injury, or assault
(6)	Themes of pursuit, entrapment, and escape
(7)	Bizarre story or theme
Identification	
(1)	Emulation of skills
(2)	Emulation of characteristics, qualities, or attitudes
(3)	Regulation of motives or behavior
(4)	Self-esteem through affiliation
(5)	Work; delay of gratification
(6)	Role differentiation
(7)	Moralism

TABLE 1.—Definition of defense mechanism.

- A mental operation that occurs outside of awareness.
- The function of the defense mechanism is to protect the person from experiencing excessive anxiety.
- An additional function of defense mechanisms is the protection of the self—self-esteem, and, in more extreme cases, protection of the integration of the self.

A 5-year-old told the following story that illustrates the use of denial.

A statue . . . climbing down a rope. He falls and then breaks. And then somebody builds him back up and he does the same thing over again. The people have to build him back up and put him back up on the rope and then he swings down and breaks. (How is he feeling?) He's made of clay. He doesn't.

This narrative is unusual in that the central figure, who is almost always seen as a live man, is turned into a statue. However, in reality, statues do not climb. Given the plot of the story, it appears that the storyteller is anxious about the possibility of the central figure falling. To alleviate this anxiety, he turns the figure into something inanimate; if it is not alive, it cannot be hurt and cannot die. Even when it does fall, the denial that this is a man, by turning it into a statue, makes possible the impossible—that the figure can be put back together. Thus, there is nothing to be feared. However, the anxiety about falling is not put to rest, and the whole process is repeated. The use of denial is made most explicit in the child's closing statement: Because the figure is made out of clay, he doesn't have any feelings, and so is not afraid and is not hurt.

Consider now another story to the same TAT Card, told by a 10-year-old. In this case, the defense of projection is prominent.

A man was being chased by a bunch of soldiers who wanted to kill him. He's climbing up the rope and if he doesn't make it up he'll get chopped to death with swords. So he is hanging as tight as he can and when he gets to the top he'll be on the border—that's a secret place underground. There is this hatch that is on the border so they can't get him.

Although this story was told to the same stimulus picture, which shows only a single figure clinging to a rope, the storyteller has added numerous hostile soldiers as well as the need for protection from that hostility. The image of being chopped to death with swords comes entirely from the psyche of the storyteller, as do the soldiers and swords. Concern about places to hide and needs for protection lead to the cognitive confusion about being either on the top or underground. The focus on others being out to get him continues throughout.

Finally, consider a third story told to the same picture by a 17-year-old, in which identification is prominent.

The young man had committed a crime . . . He completes the escape . . . Upon his arrival in England he works towards ending world hunger as a self-punishment to make up for the sin he has committed.

The opening of the story indicates an incorporation of social mores—that there are laws to follow and to obey. Subsequently engaging in work becomes important, rather than unrestrained gratification, and the work selected has a moral goal—to end world hunger. At the same time, this work provides the opportunity for self-punishment as repentance for having disobeyed the law, and a recognition that the previous behavior was unacceptable and a sin.

Research to Test the Theoretical Model

An important feature of any assessment method is whether it can produce reliable results. To answer this question, we

look ahead to the results of 25 different published studies from 1987 to 2010 that used this coding method. The median interrater reliability ranged from .78 to .81 for denial, .80 to .84 for projection, and .64 to .82 for identification. In addition, 10 unpublished doctoral dissertations showed similar interrater reliabilities. These findings indicate that reliable coding is possible.

The next step was to determine whether stories told by children of different ages would support the model. To this end, stories from 320 children, ranging in age from 5 to 16 years, were collected and coded for the three defenses (Cramer, 1987). Because older children typically tell longer stories than younger ones, each child's defense scores were converted into relative, or proportional scores. In this way, story length did not influence the defense score.

The results of this first study revealed the following: Among the youngest group of children (M age = 5 years, 8 months), denial was used frequently, and then decreased sharply across the other age groups. In contrast, the use of projection increased over the childhood years, dropping off somewhat in late adolescence. Finally, identification was used very little by the youngest children, but gradually increased until it became the predominant defense in late adolescence (see Figure 2). These results were a good fit with the theoretical model.

Subsequently, Porcerelli, Thomas, Hibbard, and Cogan (1998) replicated these findings, using the DMM (Cramer, 1991b). In their study of children and adolescents, there was a steady decline after age 7 (Grade 2) in the use of denial. At the same time, projection was used consistently throughout later childhood and early adolescence, but decreased somewhat in late adolescence (Grade 11). By that time, identification had become predominant, and even more so among first-year college students. The close similarity of these results to those of my earlier study was both remarkable and gratifying.

Both of these studies were based on cross-sectional data and do show age differences, but not change with development. Although the two studies were carried out 10 years apart, and in different regions of the country, it is still possible that cohort differences associated with age might somehow account for the results. Thus, I conducted a longitudinal study, following the same children from age 6 to age 9½ (Cramer,

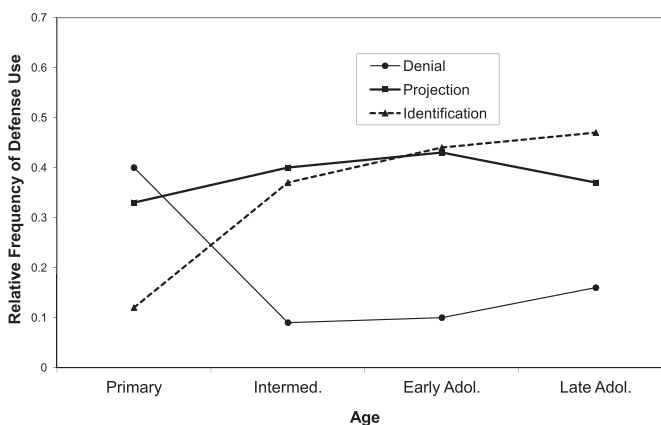


FIGURE 2.—Age differences in defense use (from Cramer, 1987). © Wiley. Reproduced by permission of Wiley. Permission to reuse must be obtained from the rightsholder.

1997). Again, using TAT stories coded with the DMM, the results showed that the use of denial decreased steadily over the age range, the use of projection increased beginning at age 8, and the use of identification was at a very low level, but slowly began to increase between age 6 and age 9. Again, these findings support the theoretical model.

WHY DOES DEFENSE USE CHANGE WITH DEVELOPMENT?

It is clear that cognitive development makes possible the operation of more cognitively complex defenses. But this fact alone does not explain why defense use changes, only how it is possible. To understand the why of change, we return to a consideration of the nature of the defense mechanism as a cognitive operation that functions outside of awareness. According to theory, lack of awareness is one of the reasons that defenses are successful—that is, we are unaware that we are “deceiving” ourselves. In thinking about why children abandon certain defenses and replace them with others, it seemed that the issue of awareness might be critical.

Previous research had shown that, as children mature, they develop an understanding of how different defenses function. Young children (age 5–6) have little understanding of denial, whereas 11-year-olds have difficulty understanding projection (Chandler, Paget, & Koch, 1979; Dollinger & McGuire, 1981; Whiteman, 1967). These findings suggested that once a child consciously recognizes a defense and its function, the usefulness of that defense should decrease. Children might then abandon that defense, and in its place adopt another defense that is more complex and, as yet, not understood.

To investigate this possibility, we studied children's use of defenses in conjunction with their understanding of how defenses function (Cramer & Brilliant, 2001). Our study included children from two age groups. One group consisted of children with a mean age of 7 years, 3 months, in which the shift from denial to projection should be occurring. The mean age of the other group was 10 years, 4 months, the age at which projection should be the predominant defense for some of the children. The study was carried out in two sessions.

In Session 1, both groups provided TAT stories that were subsequently coded for defense use. In Session 2, each child was queried to assess the degree of his or her defense understanding—that is, how well he or she understood the way in which the defenses of denial and projection function. Understanding was rated on an 7-point scale, ranging from Level 2 (*no understanding*) to Level 8 (*complete understanding*). Most of the older children understood the function of denial, but among the younger children there was considerable variability. For the older children, there was considerable variability for understanding projection.

We then compared the younger children's level of understanding of denial with their use of denial. If our hypothesis is correct—that understanding a defense will preclude its use—children who understood the defense should use that defense less. The results showed that those children who had at least partial understanding of denial were less likely to use denial than those children who had no or minimal understanding of the defense. In a similar way, we determined the level of understanding of projection among the older group of children. The majority of the children showed minimal or no

understanding, but some showed partial or nearly complete understanding.

We then compared the use of projection with level of understanding. As seen in Figure 3, the children who had no understanding of projection (Level 2) were more likely to use projection than those who had some understanding of the defense. In fact, these data showed a significant linear trend ($p < .01$) for the relation between use and understanding.

These findings, then, support the theoretical assumption that the usefulness of a defense depends on its not being consciously understood. Once the function of the defense is consciously realized, its usefulness declines and a new, cognitively more complex and not yet comprehended defense takes its place.

HOW DO WE KNOW WE ARE ASSESSING DEFENSES?

From theory, we can identify three conditions that should be met, if our method is indeed assessing defenses. First, the use of defense mechanisms should increase under conditions of stress or threat to the self. Second, defenses should protect the individual from psychological distress. Third, excessive reliance on age-inappropriate defenses should be associated with psychopathology. For each of these conditions, there is relevant research.

Hypothesis 1: Defense Use Should Increase Under Conditions of Experimentally Induced Stress

In each of these experimental studies, the participants were fully debriefed at the end of the experiment, and so did not leave unhappy or upset.

In the initial test of this hypothesis, we created an experiment in which elementary school children experienced a mildly stressful situation, and we observed the effect of this stress on their use of defenses (Cramer & Gaul, 1988). Sixty-four elementary school children participated in this two-session study. During the first session, they told stories to TAT pictures, which were then coded for defense use under

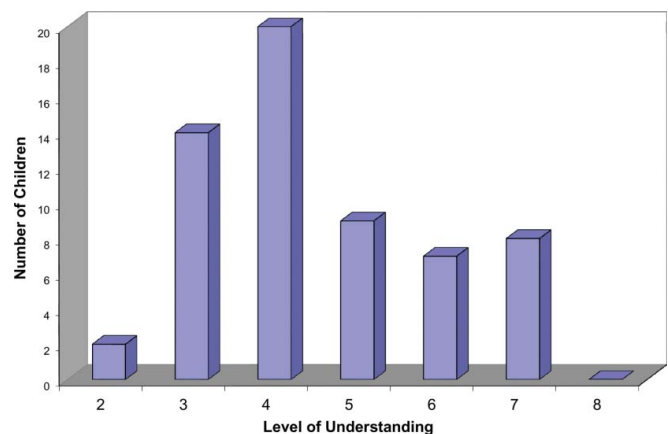


FIGURE 3.—Use and understanding of projection: Grades 4 and 5 (from Cramer, 2001). © Wiley. Reproduced by permission of Wiley. Permission to reuse must be obtained from the rightsholder.

minimal stress. This coding was used to create groups matched for defense use.

In the second session, having established these matched groups, we provided each group with a different experience. Half of the children experienced success and half experienced failure. To accomplish this, each child participated in a game that involved placing a marble at the top of a wooden rollway; the object of the game was to see how rapidly the child could get the marble to roll down a multilevel wooden track to exit from a chute at the bottom. The task was described to the child as one that depended on personal ability—skill and motor coordination—and that each child should try to get the marble to roll down the track fast enough to beat the time that “most kids your age could beat” (in fact a fictitious time). In addition, the children were told that if they did beat that time, their name, attached to a big gold sticker, would be placed on the honor board along with those of other children who had done well. This honor board, with awards attached, was placed in the child’s clear view.

To create the situation of success or failure, the experimenter used a stopwatch to measure the time elapsed between placing the marble onto the track and its exit from the bottom chute. Regardless of the actual time elapsed, children in the success condition were told they had beaten the time, and their names were put on the honor board. Children in the failure condition were told they had not beaten the necessary time, and their name could not be put on the honor board. In a previous pilot study, we had determined that this experimental procedure elicited positive emotions among children experiencing success, but negative affect among those experiencing failure.

Immediately following the experience of success or failure, the children again told TAT stories, which were coded for defense use. Our interest here was in whether those children who had experienced failure would tell stories in which there was a higher incidence of defense use. If so, then we might conclude that the increased use of these defenses occurred as a way to protect the child from potential upset associated with the arousal of negative emotions. After the storytelling, all children in the failure condition were given another chance with the marble rollway; all of them were “successful” this time and had their names put on the honor board.

The results of this study confirmed the prediction that the failure condition would result in greater use of defenses. Although the success and failure groups had not differed in defense use prior to the game-playing session, after the experimental treatment those children in the failure group used more denial and more projection than did children in the success group. Thus, under conditions of negative affect arousal, the children used age-characteristic defenses.

In a second study, we applied this experimental paradigm to a group of college students (Cramer, 1991a). Students were individually escorted to the experimental room, where they lay on a cot with a video camera focused directly at them. The experimenter explained that this was a study of creative imagination in college students. Standard TAT instructions were given, again emphasizing the use of imagination. The student was given four TAT cards, one at a time, and asked to tell a story to each card. During this time, after each story, the experimenter responded neutrally, saying “all right” or “okay,” “here is the next card.” However, after the fourth story

for students in the experimental group, the experimenter became extremely critical, saying, “These stories are about the worst I have ever heard. Could you try to get some better ones?” After the fifth story, the criticism continued, as it did after the sixth and seventh stories. In contrast to the experience of the criticized students, those in the control condition continued to receive the neutral reaction of the experimenter for all eight stories. For both conditions, stories were coded for defense use during the first four and the second four stories. At the end of the eighth story, as a manipulation check, students sat up and completed a questionnaire describing their emotional experience during the experiment. They were then debriefed; the purpose of the criticism was explained, and assurance was given that the stories they told were quite adequate.

As in the children’s study, our hypothesis was that the experimental creation of a negative affect situation would increase the use of age-appropriate defenses. As can be seen in Figure 4, this is what happened. Although the stress and control groups did not differ in defense use for the first four stories, those students who were then criticized significantly increased their use of the age-appropriate defenses of projection and identification. Denial also increased, but the increase was not statistically significant.

A third study, also with college students, focused on threatening a specific aspect of the students’ identity—namely, their sex-role orientation (Cramer, 1998). Again, the prediction was that this threat to identity would increase the use of defenses. In this study, after providing an initial set of three TAT stories, each student was given the Bem Sex-Role Inventory (Bem, 1974), from which a student’s predominant sex-role orientation would be assessed. On completing the Bem, its purpose was explained and the examiner left the room for a few minutes to “score” the student’s answer sheet. On return, the student was presented with a complicated table of statistics and was told that his or her score was either extremely high on the masculine scale, or extremely high on the feminine scale. Half of the students were given gender-consistent feedback (i.e., males were told they scored high on the masculine scale, females that they scored high on the feminine scale) and half were given gender-inconsistent feedback (i.e., males told they

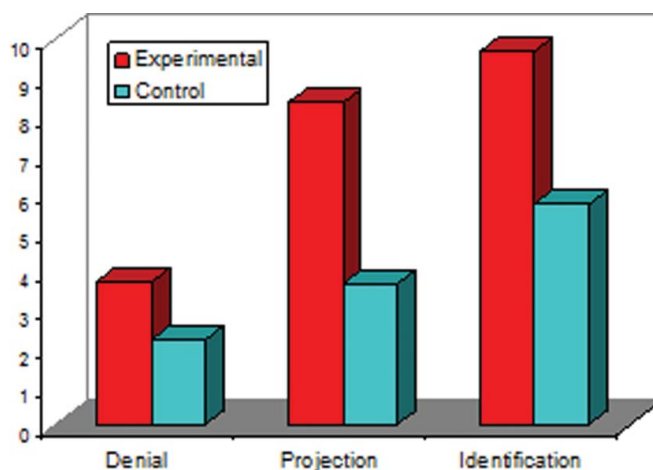


FIGURE 4.—College students: Defense use following criticism (data from Cramer, 1991b).

scored high on the feminine scale, females that they scored high on the masculine scale). All students were then engaged in a brief discussion, in which they were asked to explain their Bem results. Subsequently, each student wrote three more TAT stories. Our interest was in whether, having been provided with (bogus) feedback regarding their sex-role orientation, students who had received gender-inconsistent feedback would, as a result of a threat to the self, increase their use of defenses.

The results of the study were very clear. Before the bogus intervention, the four groups did not differ in their use of the three defenses. However, after the intervention, those students who had received the gender-inconsistent feedback showed a dramatic increase in the use of identification, the defense that is both age-appropriate and appropriate for a threat to the self.

One final experimental study was carried out with fourth-grade girls (Sandstrom & Cramer, 2003). In this study, the social status of each girl had been previously determined, using a sociometric rating procedure. Equal numbers of girls rated as popular, average, neglected, and rejected were then chosen to participate in the laboratory study. When they arrived at the lab, each child told three TAT stories. Then, each girl was told that there was another girl down the hall that she would be able to play with, using "closed-circuit TV." In fact, this other girl was a peer actor whose message had been prerecorded on videotape. When it came time for the play activity to begin, the girls exchanged preliminary self-descriptions. Then the girl asked the peer, via the TV setup, if she would like to play a game. The peer, via a prerecorded message, responded by rejecting this offer to play, saying, "No, I don't want to play with you." Following this staged rejection, the child subject told an additional three TAT stories.

The hypothesis was that peer rejection would result in greatest distress, and thus greatest defense use, for girls who were of low social status and had a history of being rejected. The results indicated that there was a linear function denoting the effect of rejection on the girls, as related to sociometric status. Girls who were typically rejected or neglected made greater use of defenses than the average or popular girls. We understood this as being due to the rejected and neglected girls being more sensitive to current peer rejection—more stressed by it. In fact, we were able to show that among the socially maladjusted girls, the lower the social status of the girl, the greater the increase in stress following rejection, and that this increased stress in turn mediated the subsequent use of defenses. However, among the well-adjusted girls, relative social status did not predict stress increase, which in turn was unrelated to defense use.

These four studies, then, demonstrate that the TAT-based measure of defense mechanisms, as coded by the DMM, produces the results that defense mechanism theory would predict—namely, defense use should increase under conditions of stress or threat to the self.

Hypothesis 2: The Use of Defense Mechanisms Should Protect the Individual From Psychological Distress

According to theory, the function of the defense mechanism is to protect the individual from anxiety and emotional distress. The opportunity to test this assumption arose in

connection with a naturally occurring disaster (Dollinger & Cramer, 1990). A group of preadolescent boys were engaged in a soccer game when a thunderstorm began. Shortly into the second half of the game, a lightning bolt struck the playing field. All the players were knocked to the ground; one boy was hit directly by the strike and died.

A child clinical psychologist, Dr. Stephen Dollinger, undertook a clinical assessment of these boys. As part of this assessment, he rated their level of emotional distress. This rating of distress was subsequently found to be a valid predictor of the parents' report of psychological problems in the boys (Dollinger, O'Donnell, & Staley, 1984). It also significantly predicted which boys avoided playing soccer in the subsequent 2-year interval (Dollinger, 1985).

At the time of the assessment, the boys told two stories to pictures depicting lightning. Several years later, these stories were coded with the DMM. It was predicted that those boys with higher defense scores just following the stressful incident would be clinically assessed as showing less psychological distress. That is, using defenses would protect them from psychological distress at that time. This prediction was supported. Those boys who had total higher defense scores (Denial + Projection + Identification) were less distressed than those with lower defense scores. Further, when the use of only the two more mature defenses of projection and identification were considered, the relation between defense use and lack of distress was even stronger (i.e., $b = -.53$, $p < .004$). Thus, the utilization of defense mechanisms, as determined from defense coding, was consistent with theory: Those boys who used more defenses at this time of psychological stress showed fewer signs of psychological distress.

Hypothesis 3: Excessive Reliance on Age-Inappropriate Defenses Is Associated With Psychopathology

Data from a study by Blatt and Ford (1994) of patients at a small hospital offering intensive treatment are informative here. On admission to the Austen Riggs Center, patients provided TAT stories that were coded for defense use. Then, patients diagnosed as psychotic were compared with those having a personality disorder diagnosis. The results indicated that, on entrance to the hospital, the more seriously disturbed psychotic patients had higher scores for all three defenses. After 15 months of treatment, patients again provided stories to the same TAT cards. After treatment, the psychotic patients had significantly reduced their total defense use, and especially the use of denial. Further, when the patients were independently rated by clinicians for the degree of improvement after 15 months of treatment, those who were rated most improved had lower defense scores, and especially lower denial scores, as compared to those who were rated as least improved. It is especially noteworthy that the more seriously disturbed, psychotic patients made greatest use of the low-level immature defense of denial. This is one example from a larger body of research literature showing that defenses coded with the DMM are related to various psychiatric diagnoses in adults (e.g., Cramer & Blatt, 1990, 1993; Cramer, Blatt, & Ford, 1988; Hibbard et al., 1994; Hibbard & Porcerelli, 1998; Hibbard, Porcerelli, Kamoo, Schwartz, & Abell, 2010).

Defense use has also been found to be related to psychopathology in adolescents and children. For example, adolescents

who were diagnosed with conduct disorder were compared with those who had a less severe diagnosis of adjustment disorder (Cramer & Kelly, 2004). Those adolescents with the psychiatric diagnosis of conduct disorder made greater use of the immature defense of denial, as compared to the less disturbed adolescents diagnosed with adjustment disorder. Also, the conduct disorder group made very little use of the mature defense of identification.

In another study, the use of denial by fourth graders (for whom it is age inappropriate) was found to be significantly related to the presence of externalizing and internalizing problems (Achenbach & Edelbrock, 1983) and to the presence of social anxiety (La Greca & Stone, 1993). In contrast, children of this age who made greater use of identification were found to have higher scores on all of Harter's (1982) dimensions of competence.

To summarize, there are three theoretical assumptions about defense mechanisms that are all supported when defenses are assessed from narrative stories coded with the DMM: (a) Experimentally induced stress increases defense use, (b) defense use protects children from psychological distress, and (c) excessive use of age-inappropriate defenses is associated with psychopathology in adults, adolescents, and older children. In turn, these results support the validity of this measure for assessing defense mechanisms.

IS IMMATURE DEFENSE USE BY ADULTS A RESULT OF REGRESSION OR FIXATION?

The use of immature defenses by psychologically disturbed individuals raises the question of how this comes about. Is it a result of regression to a lower level of functioning, or have these individuals failed to develop more mature forms of defense, and instead remain fixated at an earlier stage of defense development? A definitive answer to this question would require a long-term longitudinal study, in which defense use was continually assessed from early childhood to the point in adulthood where pathology was manifest. To my knowledge, no such study exists. There are, however, longitudinal studies of development in which extensive information regarding psychological functioning at early and later ages is available. In one of these, carried out by Block and Block (1980), children were assessed at 3 years old and continually until age 23, when the participants provided TAT stories. These stories were subsequently coded for defense use. It was thus possible to compare ratings of their preschool psychological functioning with their adult defense functioning (Cramer & Block, 1998).

As would be expected for 23-year-olds, the use of denial was relatively rare. However, for some individuals, this defense was predominant. These were not hospitalized patients, but they relied on an immature defense rather than one that would be more developmentally appropriate. Is there some way to understand this anomaly?

Because there was no information regarding their earlier defense use, it is not possible to know whether the current use of denial reflects fixation, or a regression from a higher to a lower level of defense functioning. However, we do have information about the psychological status of these young adults when they were 3 years old, when denial was age

appropriate. It is possible that, if these individuals showed unusual psychological stress during this very early period of development, the defense of denial would be used excessively at that time. As a consequence of this overuse, denial might become firmly embedded in the child's personality. We look, then, to discover what these adults who relied on denial at age 23 were like as preschoolers.

In preschool, the teachers of these 3-year-olds had described those children who later made high use of denial as showing low self-worth, being emotionally labile and inappropriate, lacking intellectual competence, having poor impulse control and poor interpersonal relationships, and lacking prosocial skills. These findings suggest psychological disturbance at this early age and are consistent with the theoretical assumption that psychological disturbance at age 3 will increase the use of the age-appropriate defense of denial at that time. Under these conditions, we might theorize that these children continued to rely on that defense 20 years later, into young adulthood, when it is no longer age appropriate.

This is just a sampling of the empirical research studies that have been carried out over the past 40 years. Further studies have demonstrated the relation of defense use to changes in Big Five personality traits across adulthood, to change in identity status, to relation with Loevinger's (1976) ego levels of development, to specific personality disorders, and to physiological change. The results of this work are summarized in two of my books, *The Development of Defense Mechanisms: Theory, Research, and Assessment* (Cramer, 1991b), and *Protecting the Self: Defense Mechanisms in Action* (Cramer, 2006). There are many other studies that have used this approach to investigate defense mechanisms, which I provide at the end of this article.

In all, it has been a very exciting area of research—this exploration of activity below the surface. I hope I have been able to share this excitement with you.

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