EFFECTS OF VERBAL IQ, GENDER, PRIOR KNOWLEDGE, AND MODALITY UPON MEMORY FOR CLINICAL INFORMATION

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I would like to dedicate this dissertation to my husband, Lester Yim, and children, Kevin and Julianne.

I would also like to dedicate this work in memory of my parents, Hung Chong and Marilyn Mew.

I am truly grateful for the support and guidance of my graduate advisor, Dr. Elaine Heiby, in preparation of this dissertation.

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ABSTRACT

Clinical informational materials can play an important role as an adjunct to therapy, but little research has systematically examined how information can be presented to maximize participant satisfaction with and memory for information. The current study involved a series of four programmatic experiments having the goal to investigate whether verbal ability, gender, self-reported prior knowledge, and mode of presentation would have a significant effect upon participants' cued recall task scores, multiple choice test scores, and scores on a measure of participant satisfaction with modality. Experiments 1-3 were used to develop and evaluate the independent and dependent measures used in Experiment 4. The final sample for Experiment 4 was comprised of 299 University of Hawaii undergraduates, who randomly signed up for a print, audiotape, or videotape presentation on the topic of Borderline Personality Disorder. Results indicated: (a) a significant main effect of modality on the cued recall task, multiple choice test, and satisfaction measure, and (b) a significant main effect of verbal ability on the cued recall task and multiple choice test. Print and videotape participants had significantly higher scores on memory indices and on a

measure of participant satisfaction compared to participants in the audiotape condition. Notably however, the effect size for modality was very small. No two-way or three-way interactions were observed among dependent measures. Clinical implications of these findings are discussed.

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CHAPTER 1. INTRODUCTION

Recent changes to the health care system and increasing accountability pressures from managed care providers have heightened the need for clinicians to increase the cost effectiveness of time spent in therapy (Christensen & Jacobsen, 1994). Available research suggests that one potential way cost effectiveness may be increased is through providing clients with adjunctive informational materials via print (Katz & Watt, 1992; Riordan & Wilson, 1989), audiotape (Lansky, 1988; Lawe, Horne, & Taylor, 1983), or videotape (Gagliano, 1988; Pimpernell & Treacher, 1990; Solomon, DeJong, & Jodrie, 1988).

Informational materials presented via print, audiotape, and videotape can potentially play an important role as an adjunct to therapy when administered prior to or during the course of treatment (Lansky, 1988; Lawe et al., 1983; Webster-Stratton, 1993). Prior to the onset of therapy, informational materials can be used to: (a) educate clients about what to expect in therapy (Deane, Spicer, & Leathem, 1992; Lawe et al., 1983; Pimpernell & Treacher, 1990), (b) encourage participation (Lawe et al., 1983), and (c) supplement the knowledge of clients or family members who lack information about a

treatment or a disorder (Lansky, 1988). During the course of therapy, printed, audiotaped, and videotaped materials can be used (a) to remind clients of therapy goals or homework, or (b) to allow clients to review information at their own pace, leaving time with the therapist to discuss specific issues in a more cost-efficient manner (Webster-Stratton, 1993). Printed, audiotaped, and videotaped materials can serve as a cost-effective alternative to time spent in therapy in part because they can be easily standardized and replicated (O'Dell, Mahoney, Horton, & Turner, 1979). Although the presentation of these materials alone may not be sufficient for behavior change for most clients (Herbert, 1996; Riordan & Wilson, 1989), use of printed, audiotaped, and videotaped materials can nonetheless play an important role in treatment, and continued research into their use as an adjunct to therapy appears justified.

Accumulating clinical evidence suggests that printed, audiotaped, and videotaped materials can be used to provide clients with information relevant to treatment for a range of disorders (Gould & Clum, 1993; Lansky, 1988; Riordan & Wilson, 1989). For example, informational materials have been used as adjuncts to psychological

treatment for depression (Schotte, Maes, Beuten, & Vandenbosche, 1993), panic disorder (Gould & Clum, 1995), bipolar disorder (Peet & Harvey, 1991), and alcoholism (Stalonas, Keane, & Foy, 1979). In the medical field, informational materials have been used as adjuncts to treatment for asthma (Moldofsky, Broder, Davies, & Leznoff, 1979), cancer (Israel & Mood, 1982), hypertension (Buckley, Plaut, & Ruley, 1982), and chronic medical conditions (Mullen, Green, & Persinger, 1985).

Although the increasing application of informational materials as an adjunct to treatment for a range of problems is promising, one key issue that has not been adequately addressed in the literature is whether informational materials differ in their communicative efficacy depending on their mode of presentation via print, audiotape or videotape (Nay, 1975; O'Dell et al., 1979; O'Dell, O'Quin, Alford, O'Briant, Bradlyn, & Giebenhain, 1982; Stalonas, Keane, & Foy, 1979; Tymchuk, Ouslander, & Rader, 1986). Although researchers commonly use adjunctive informational materials presented via print, audiotape, or videotape as part of treatment packages for disorders (Gould & Clum, 1995; Lansky, 1988; Peet & Harvey, 1991; Solomon et al., 1988), researchers do not appear to be using a systematic, empirical

approach to the selection of modality. Review of the clinical literature indicates only a handful of studies have directly isolated the effects of modality by varying modality for informational content with study parameters kept constant (Flanagan, Adams, & Forehand, 1979; Nay, 1975; O'Dell et al., 1982; Stalonas et al., 1979). Conclusions are difficult to draw on the basis of these few studies because the interventions used in studies differ in terms of informational content, participant population, intervention length, and purpose, making the generalizability of findings of any one study unclear. Analyzing this literature in the context of these parameter differences is especially difficult because more research is needed to determine if parameters (a) represent meaningful groupings of studies or (b) have an influence on outcome.

Although more research remains to be conducted, it appears that one way to distinguish different types of informational interventions may be to differentiate them according to whether a modeling component is present. Though findings are not unequivocal, clinical research provides some evidence that the videotape modality may be more effective than print or audiotape presentations in communicating a skill to be modelled when the content has

involved teaching time out (Flanagan et al., 1979; Nay, 1975) or reinforcement skills (O'Dell et al., 1982). This finding of videotape superiority might be somewhat expected since videotapes may inherently have a greater ability to communicate more nonverbal aspects of the modelled situation than printed materials or audiotapes (Gould & Clum, 1993). If this conclusion is true, this would imply that it would then be important to distinguish interventions that include a modeling component from those that do not include a modeling component. This may be an important convention to adopt because attempting to analyze findings without respect to meaningful differences in interventions may result in concealing consistent patterns of findings that are present.

The foregoing discussion will distinguish between (a) studies that employ an intervention that includes a modeling component and (b) studies that employ an intervention that does not include a modeling component. The current investigation focused on investigating the effects of modality for information not involving a modeling component. As will be argued later, this focus is warranted because no systematic clinical research has been conducted in this area. Although the current study

focused on the effects of modality for information not involving a modeling component, both this literature and the literature examining the effects of modality for information involving a modeling component will be reviewed. The discussion of the latter is justified because researchers in this literature (e.g., O'Dell et al., 1982) have examined the influence of participant characteristics on outcome, which was also a key focus in the current study.

Interventions That Involve a Modeling Component

In the clinical psychology literature, research examining the effects of mode presentation for information involving a modeling component has been generally limited to studies examining the effectiveness of standardized modeling programs teaching parents time out (Flanagan et al., 1979; Nay, 1975), reinforcement skills (O'Dell et al., 1982), and communication skills (Hudson, Doyle, Venezia, 1991). Several studies have shown an advantage for videotape modeling over other modes of presentation (i.e., written materials), as well as other forms of training (i.e., lecture, live modeling or rehearsal) (O'Dell et al., 1979, Webster-Stratton, 1993), although this has not been an entirely consistent finding (Hudson et al., 1991;

O'Dell et al., 1982). In an often-cited study, Nay (1975) found that participants who were presented with (a) videotape modeling or (b) modeling plus role play were superior at performing time out procedures as compared to participants who had received only (c) written instructions, (d) lecture, or (e) live modeling. In an extension of Nay's (1975) findings to a broader sample in terms of ethnicity and socioeconomic status, Flanagan et al. (1979) compared the effects of print, videotape, lecture, and role play training on a knowledge questionnaire and at home observation of parents performing time out with their children. Results indicated that groups did not differ on the knowledge questionnaire. However, a significant effect of training was found on the home observational measure; participants in the videotape modeling condition evidenced significantly better scores on the observational measure as compared to participants presented with either (a) written materials only or (b) no treatment. No other significant differences amongst groups were found on the home observational measure. Other studies by O'Dell and colleagues (O'Dell et al., 1979; O'Dell, Krug, O'Quin, and Kasnetz, 1980) have generally confirmed the superiority of videotape modeling and videotape modeling

plus rehearsal for time out as compared to written materials, individual modeling plus rehearsal, and no treatment. As some reviewers have suggested, a videotape format may potentially exceed other modalities in presenting skills that are easily observed and imitated because it can communicate more nonverbal aspects of the modeled situation than written materials or audiotapes (Gould & Clum, 1993).

Although some studies have indicated videotape superiority for informational content having a modeling component (Flanagan et al., 1979; Nay, 1975), researchers have suggested that the above findings should not be regarded as conclusive because complex interaction effects may exist between types of training, intervention content, participant characteristics, and the type of outcome measured (O'Dell et al., 1979; O'Dell et al., 1982). As an example, O'Dell et al. (1979) attempted to investigate whether the effects of training (written, videotape, videotape plus rehearsal, individual modeling and rehearsal, and brief individual modeling and rehearsal) were influenced by parents' verbal IQ test score. O'Dell et al. (1979) found (a) a main effect for training and (b) a main effect for verbal IQ, but no interaction between the two factors. Although these

findings did not support the hypothesis that parent verbal IQ interacts with type of training, findings should not be interpreted as ruling out interaction effects because there were methodological weaknesses in the methods O'Dell et al. (1979) used to detect an interaction (see Cronbach and Snow, 1977). In particular, (a) the sample size (N = 60) was likely too small to detect an interaction, and (b) their use of a median split in range of verbal IQ scores could have erroneously distinguished between individuals whose aptitudes may have differed little, and grouped together individuals whose scores may have differed greatly.

In another study, O'Dell et al. (1982) investigated whether the effects of mode presentation (print, audiotape, videotape, and individual modeling plus rehearsal) of reinforcement skills as compared to a no-treatment control were influenced by the following parent characteristics: (a) socioeconomic status (SES), (b) years of education, and (c) reading ability. When correlations of parent characteristics with the measure of reinforcement skill were examined, significant correlations were found for: (a) SES with respect to the control, written and audiotape conditions, (b) grade completed with respect to the control, audiotape and

rehearsal conditions, and (c) reading level with respect to the control, written, audiotape, and rehearsal conditions. The small sample size (N = 100) of O'Dell et al. (1982) speaks to the strength of these interactions, but also suggests replication is warranted.

Although the studies of O'Dell and colleagues (O'Dell et al., 1979; O'Dell et al., 1982) suffer from methodological problems and are far from conclusive, they nonetheless represent an important advance in the literature for attempting to evaluate (a) the potential contribution of participant variables to outcome and (b) their potential interaction with modality. Evaluating the influence of participant variables on outcome may be important in light of suggestions from the patient education literature that researchers should not attempt to find the "perfect" informational interventions that are applicable to all individuals, but should instead try to determine which interventions are effective for what types of individuals, for what outcomes, under which conditions (Cronbach & Snow, 1977; Holloway, Spivey, Zismer, & Withington, 1988; Snow, 1991).

Interventions Not Involving a Modeling Component

Systematic investigations of the effects of modality for information not involving a modeling component have

not been conducted in the clinical literature, in contrast to the more extensive research conducted for information involving a modeling component discussed above. Results of a Medline search, a Psychlit search, and a search of relevant clinical journals in the patient education literature by the current author yielded only three studies which directly isolated the effects of modality by varying mode presentation while keeping informational content and study parameters constant (Marshall, Rothenberger, Bunnell, 1984; Stalonas et al., 1979; Tymchuk et al., 1986). Conclusions about the effects of varying modality are difficult to draw from these three studies due to their paucity, and the fact that these studies (a) suffer from a range of methodological problems, and (b) consist of isolated reports that are too varied in methodology, content, purpose, and study population to allow conclusions about the efficacy of modality.

In one study, Stalonas et al. (1979) investigated the effects of an alcohol education program presented either via print, videotape, or live group lecture with participants who were either volunteers from an intensive treatment program or inpatient medical admissions for detoxification. The informational intervention consisted

of four one-hour sessions, with a 15-minute discussion session following each session. Results of a multiple choice test on the content of the intervention found superior performance of the videotape group compared to the written or live lecture group. The generalizability of these findings is unclear, however, since: (a) the content of the discussion groups may not have been equivalent across conditions and (b) randomization was unclear. In addition, Stalonas et al. (1979) have also suggested that the superiority of the videotape condition may have been influenced by the novelty of videotape at the time the study was conducted (i.e., 1979).

In another study, Tymchuk et al. (1986) investigated comprehension of a patient bill of rights for a geriatric population by presenting participants with either: (a) the full version of the bill of rights via print, (b) a simplified print version of the bill of rights, (c) a story book version via print, or (d) a story book version via videotape. When the performance of individuals with severe cognitive deficits was excluded, these investigators found better comprehension for the group presented with the simplified print version of the bill of rights compared to groups presented with (a) the standard bill of rights, (b) the print story book version

or (c) the videotape story book version. These findings cannot be interpreted to suggest an overall print superiority, however, since generalizability may be limited in light of (a) the age of the participant population, and (b) the fact that the effects of modality were evaluated only for the story book version of the bill of rights.

In a third study, Marshall et al. (1984) compared the effects of varying presentation of information regarding contraceptive techniques for female patients requesting contraceptives from their physicians. Patients received either: (a) a pamphlet, (b) oral communication from their physician, (c) slide presentation and audiotape with their physician speaking on the audiotape, (d) slide presentation and audiotape with an unfamiliar voice speaking on the audiotape, or (e) a combination condition which included presentation with a pamphlet, oral communication from their physician, and the slide and sound presentation with their physician's voice. Participants received a medical examination after being presented with their respective interventions. Dependent measures included: (a) a knowledge questionnaire, (b) a measure evaluating participants' satisfaction with the way in which the

information was presented, and (c) a questionnaire completed by the physician which evaluated the patient's understanding of contraceptives at the end of the visit. With respect to patient knowledge of contraceptive use, results indicated that all three groups presented with a slide and audiotape presentation (i.e., slide and audiotape with an unfamiliar voice, slide and audiotape with the physician's voice, combination treatment) evidenced superior knowledge of contraceptive use compared to groups presented with either the pamphlet only or oral presentation by the physician. With respect to participant satisfaction, researchers found no significant differences between groups, though data indicated a trend towards greater satisfaction for the combination condition over the pamphlet. Findings of this study are of interest particularly since they suggest response desynchrony may occur between measures of knowledge and participant satisfaction. However, the generalizability of findings is unclear given (a) sample size (N = 100) was small and (b) the amount of time the physician spent talking to patients varied as a function of patients' group membership.

As the above studies indicate, research into the effects of modality for information not involving a

modeling component has been limited. Extant research does not allow us to draw firm conclusions about the effects of modality due to (a) methodological problems of individual studies and (b) cross-study variance in participant characteristics, intervention content, study protocol, and length of informational interventions used. The absence of definitive information on the effects of modality for information not involving a modeling component is problematic since it is likely that a significant proportion of informational interventions will be comprised of this type of information. This absence of information on the relative efficacy of modality does not allow researchers and clinicians to design informational materials with an understanding of the effects of modality, and whether a particular intervention would be best communicated via print, audiotape, or videotape. Given the absence of this information, the current study investigated the effects of modality for information not involving a modeling component. Because systematic approaches to evaluate the effects of modality for information not involving a modeling component have been absent in the clinical literature, the current study drew instead from methodology used in the applied cognitive psychology and

mass communications literatures, which has investigated the effects of varying mode presentation on memory for information not involving a modeling component.

Research into the Effects of Mode Presentation from the Applied Cognitive Psychology and Mass Communications Literatures

A consistent body of literature from the applied cognitive psychology and mass communications literatures suggests that individual modalities may differ in their effect upon memory indices for information not involving a modeling component (Furnham & Gunter, 1985; Furnham, et al., 1990). Researchers have consistently found that participants presented with informational content via print exhibit superior free recall and cued recall compared to participants who have been presented with the same material via audiotape or videotape (e.g., Furnham & Gunter, 1985; Furnham et al., 1990). Print has been associated with superior memory for information as compared to audiotape and videotape for several nonclinical content areas, including news (Furnham & Gunter, 1985), scientific material (Furnham et al., 1990), party political broadcasts (Gunter, Furnham, & Leese, 1986), and advertising (Furnham, Benson, & Gunter, 1987). Within the applied cognitive psychology

literature, no studies attempted to determine if this effect would replicate with clinically-relevant content.

The above findings suggested that a next step in the literature would be to investigate whether a print superiority effect replicated with clinical content. Yim (1995) investigated the effects of varying presentation of three modalities (print, audiotape, and videotape) of clinical information upon participants' free and cued recall task scores (see Appendix A). In this study, the methodology, sample size (N = 57), and design parameters were adapted from Furnham et al. (1990). The informational content of the independent variable consisted of a modified version of a narrative on the topic of Borderline Personality Disorder that was described as being effective in educating psychiatric inpatients (Lansky, 1988).

Yim (1995) represented an improvement over both (a) extant clinical studies and (b) the work of Furnham and colleagues (Furnham et al., 1990) by attempting to establish several methodological standards not incorporated into past research. A major contribution of Yim (1995) was the introduction of independent evaluations of the quality of (a) the levels of the independent variable (i.e., print, audiotape, and

videotape) and (b) the dependent variables (i.e., free and cued recall). There were several justifications for these improvements. First, evaluating the quality of the levels of the independent variable was justified because (a) a mode of presentation with poor quality could potentially depress participant scores for that modality independent of the effects due to modality alone and (b) the majority of studies in the clinical and applied cognitive psychology literatures have not reported this internal validity check (Browne, 1978; Furnham et al., 1990; Gunter & Furnham, 1986; Stauffer et al., 1981; Williams, Paul, & Ogilvy, 1957). In addition, evaluating the clarity and content validity of dependent measures was also justified since (a) use of unclear, unrepresentative measures could introduce measurement error, and (b) studies typically do not report this face and content validity check (Browne, 1978; Furnham et al., 1990; Gunter & Furnham, 1986; Stauffer et al., 1981; Williams et al., 1957).

Results of a MANOVA analyzing the effect of modality on free and cued recall task scores found no significant differences between groups (Yim, 1995). However, conclusions could not be drawn from these findings because a post hoc power analysis indicated that the

investigation lacked adequate power to discriminate amongst groups, despite replicating the sample size and selected study parameters from Furnham et al. (1990). Several factors were hypothesized to potentially contribute to the low power of Yim (1995) which are of relevance to the current study. First of all, low power may have been attributable to the relatively small sample size (N = 57) used in the study. Second, low power of the free recall task (.39) relative to the cued recall task (.55) could potentially have contributed to insufficient precision of the investigation. In addition, low power and error variance may have been attributable to the absence of experimental control for individual difference variables (such as verbal ability and gender) which may have had an effect on outcome either directly, or in interaction with the effects of modality.

Because several factors may have limited the power of Yim (1995), the current investigation addressed these factors while investigating the effects of modality for information not involving a modeling component.
The major goals of the current study were to:
(1) increase study power and precision over Yim (1995), and (2) increase the social validity of the levels of the independent variable. These improvements are discussed

below.

Increasing Power and Precision

Several modifications were planned to improve upon the power of the experimental tasks over that reported in Yim (1995). In terms of the dependent variables, the measure of cued recall was retained but the free recall task was replaced with a multiple choice test generated for the current study. The multiple choice test was substituted for the free recall task because it could provide more prompts for participants, and was thought to be a more reliable measure of learning due to: (a) ease of completion, (b) reduced fatigue, and (c) objective scoring, resulting in reduced error variance and allowing a finer discrimination of performance and a wider variability in participants' scores on memory indices.

The focus of the current study was to investigate whether the effects of modality upon dependent measures would interact with participants' (a) verbal ability, (b) gender, and (c) prior knowledge of the informational content of the independent variable. The rationale for examining each of these aptitudes within the context of the current investigation is discussed below.

Verbal Ability

Investigating the extent to which verbal ability

mediates participants' reported memory for information presented via different modalities appears justified because a fairly large literature has investigated the relationship between general intellectual ability and working memory capacity, and has found a strong association between these two domains (Dark & Benbow, 1994; Sternberg, 1985). Research indicates that individuals with high verbal ability scores are better able to manipulate information in short-term memory and access information from long-term memory than individuals with lower measured verbal ability scores (Pelligrino & Glaser, 1979). These findings are significant for the current study because they suggest the possibility that participants' intelligence test scores may influence participants' memory scores for information presented.

The only clinical study identified by the current author which has investigated the interaction between modality effects and IQ was the study of O'Dell et al. (1979), discussed earlier. As indicated above, O'Dell et al. (1979) investigated the potential interaction between verbal IQ scores and mode of training of child rearing procedures and found (a) a significant main effect of modality, and (b) a significant main effect of verbal IQ, but did not find an interaction. As already noted,

however, it is not likely that these findings rule out the possibility of an interaction because (a) sample size may have been insufficient to detect an interaction, and (b) use of a median split to divide groups on the basis of high and low verbal ability artificially dichotomizes a continuous variable (Cronbach and Snow, 1977).

In light of these problems, further investigation of the influence of participant verbal IQ on outcome and its potential interaction with modality effects appears justified. The current study investigated the influence of verbal IQ test scores upon memory indices for information presented via different modalities to determine if participants' scores on dependent measures varied as a function of verbal IQ test score.

Gender

In the applied cognitive psychology literature, two studies of Furnham and colleagues (Furnham & Gunter, 1985; Gunter, Furnham, & Gietson, 1984) suggest that gender may potentially mediate the effects of modality or otherwise have an impact on participants' recall for certain types of information. Gunter et al. (1984) presented participants with two news stories consisting of violent content and two stories consisting of nonviolent content, and found levels of news recall

varied as a function of gender. In their study, males recalled significantly more news content overall than females, and particularly recalled more violent content (i.e., riots in El Salvador) than females. In a subsequent study utilizing the same materials as Gunter et al. (1984), Furnham and Gunter (1985) also found a gender effect, though their findings were not identical to that of Furnham et al. (1984). Furnham and Gunter (1985) found no significant main effect of gender, but did find an interaction between gender and news type within the videotape condition, with males recalling more violent content than females, and females recalling more nonviolent content than males (Furnham & Gunter, 1985). Because findings across the two studies were not identical, it is not clear whether they reflect (a) a reliable sex difference, (b) an artifact of the populations sampled, or (c) the function of gender as a proxy for a third variable (Furnham & Gunter, 1985). Research is needed to determine if a gender effect replicates with other types of informational content. Furthermore, research is also needed to determine whether findings obtained with students from a sixth form school in the south of England (Gunter et al., 1984) and with undergraduates from University College London (Furnham &

Gunter, 1985) generalize to participants of a different geographic or cultural background.

Prior Knowledge

Addressing the potential influence of participants' prior knowledge of the informational content of the independent variable is important in experimental studies of recall because the presence of prior knowledge may increase the likelihood that new information will be assimilated into existing cognitive structures and therefore be better remembered (Furnham et al., 1984; Best, 1989). According to schema theory, prior knowledge may function as "scaffolding" to facilitate the encoding of information from its source, so that a person with background knowledge of a content area may have an advantage in learning the material over a person without any background knowledge (Stahl, Jacobson, Davis, and Davis, 1989).

Yim (1995) attempted to control for the effects of prior knowledge, experience, and exposure by excluding participants who reported previous exposure to the informational content of the independent variable either through class work, or through personal experience of either having themselves or a close friend or family member being diagnosed with the disorder. Although

these procedures were undertaken to decrease the likelihood that performance on memory indices would be affected by experiences other than exposure to the independent variable, such procedures may have been problematic for several reasons. First of all, use of these exclusion criteria resulted in eliminating 51% of participants from the original sample, which may have had the effect of decreasing variance in participant recall scores.

In addition, excluding participants on the basis of prior knowledge was problematic because the unique contribution of prior knowledge to outcome could not be assessed. In a clinical setting, individuals diagnosed with a disorder will, by definition, have some prior experience with the disorder. In addition, such individuals will likely have been exposed to some factual knowledge about the disorder. Given the likelihood that these individuals will be subject to these influences, it may thus be <u>more</u> important to evaluate the effects of modality and the effects of prior knowledge on outcome. Such an approach would allow researchers to determine if the effects of modality were consistent across levels of prior knowledge of the disorder.

To evaluate the influence of prior knowledge on

outcome, participants in the current study were asked to provide a subjective report of their prior knowledge of Borderline Personality Disorder, which comprised the content of the independent variable.

Increasing the Social Validity of the Independent Variable

In addition to the above changes, the current study improved upon the ecological validity of Yim (1995) by (a) modifying the independent variable and (b) adding a dependent variable measuring participants' satisfaction with modality. Improvements to the independent variable included: (a) optimizing the inherent features of each modality, (b) adding a case study vignette which was not part of the original narrative (Lansky, 1988), and (c) modifying the exposure time allotted to print participants to read the narrative. The rationale for each of these changes is discussed below.

Optimization of the Inherent Features of Each Modality

The first improvement to the social validity of the independent variable was to optimize the inherent features of each modality manipulation. This goal represented a significant departure from Yim (1995), which sought to (a) retain strong experimental control over contextual variables which could have had an impact

on outcome, (b) isolate the effects of modality, and (c) introduce only minimal changes to the original narrative used by Lansky (1988).

The primary means by which Yim (1995) did not optimize the inherent features of each modality was by not including features in one modality that could not be replicated in another modality. In Yim (1995), the levels of the modality manipulation were print, audiotape, and videotape. Adhering to the above criterion necessitated that the printed version of the narrative consist of typed pages of text with no illustrations or forms of emphasis in the text because these could not be replicated in the audiotape condition. Likewise, following the above criterion required that the videotape condition be operationalized in a talking head (i.e., narrator only) format with no illustrations or film pictures because these features could not be reproduced via audiotape. These restrictions, while important to a demonstration of strong experimental control, may have been problematic because they decreased the effectiveness of their respective modalities. Decreased effectiveness may have particularly been problematic for the videotape condition, since research has found that participants presented with information via film with an exclusively

talking head format evidence poorer cued recall than participants presented with the same information via film with a mixed talking head and film format (e.g., Berry & Brosius, 1991).

To address these issues, the current study redesigned the levels of the independent variable to be more socially valid and consistent with optimal production procedures (Bernier & Yasko, 1991; Rice & Valdivia, 1991). The levels of modality manipulation in the current study were print, audiotape, and videotape. The print condition consisted of a brochure consistent with principles of good layout to maximize interest in the informational content. The brochure employed design features (e.g., varying type size) to emphasize important points.

The videotape condition utilized a mixed format of talking head and film pictures. In the videotape condition, the speaker used vocal inflection for emphasis to increase interest in the content of the narrative. The audiotape condition consisted of the audio portion of the videotape, thus allowing these conditions to be maximally comparable.

Addition of a Case Study Vignette

A second improvement to the social validity of the

independent variable was to add a case study vignette to the narrative used in Yim (1995). The impetus for adding a case study vignette originated from participants' feedback on the posttest questionnaire (Yim, 1995) that its inclusion would increase interest in the informational content. Inclusion of a case study vignette was also supported by evidence that presentations that are personal and relevant to the learner are more effective than strictly didactic approaches (Wicklin & Forster, 1994).

Increasing the Social Validity of the Exposure Time Allotted to Print Participants

A final improvement to the social validity of the independent variable was to use an ecologically valid criterion to determine print participants' length of exposure to the independent variable. In the current study, participants in the print condition were allowed to read the narrative once at their own pace. This allowed participants in the print, audiotape, and videotape conditions to receive exactly one exposure to the content of the independent variable. The proposed procedure of determining print participants' exposure to the independent variable stands in contrast to both prior studies (Furnham et al., 1990) and Yim (1995), which have

utilized a fixed exposure time for print participants to read the content of the independent variable.

Allowing print participants in the current study to read the narrative once at their own pace was instituted to prevent participants in the print condition from reading the narrative more than once, which may occur when participants are given a fixed amount of time to read the material (Furnham et al., 1990). Yim (1995) gave print participants a fixed amount of time to read the narrative, which had been determined by obtaining the 90th percentile for the length of time it took 14 pilot participants to read the material once (Yim, 1995). With this fixed exposure time, print participants were found to vary in the number of reported exposures to the independent variable (Yim, 1995), which may have been problematic since research has documented that memory performance can be augmented by repeated exposures to a stimulus (Amlund, Kardash, & Kulhavy, 1986; Best, 1989). Variance in print participants' exposures to the independent variable has also been hypothesized to be a problem in extant studies of modality which typically allow print participants to read the informational content for the duration of the videotape/audiotape stimulus (Furnham et al., 1990). These problems justify

allowing print participants to read the narrative once at their own pace, to rule out the possibility that the efficacy of the print condition is confounded by repeated exposures to the narrative in this condition.

Addition of a Measure of Participants' Satisfaction with Modality as a Measure of Outcome

To evaluate the social validity of improvements to the independent variable, the current study evaluated participants' satisfaction with the modality with which they were presented as a measure of outcome. In Yim (1995), a measure of satisfaction with modality was generated by the current author and administered to participants, but this data was not analyzed as part of the original study. A post hoc analysis of variance found a significant effect of modality on the satisfaction measure, with print and audiotape participants reporting more satisfaction with their respective modalities than videotape participants (Yim, 1995c). Interpretation of these findings may be open to question though, because (a) this analysis was exploratory and (b) the modality groups did not exhibit univariate homogeneity of variance on the Cochran's C and Bartlett-Box F tests (Yim, 1995). Continued investigation of this issue does appear to be warranted,

however, especially because measures of participant satisfaction with an intervention can serve as an important indicator of outcome (Kazdin & Wilson, 1978).

Programmatic Experiments Conducted in this Investigation

The current investigation involved a series of four programmatic experiments having the final goal to investigate the effects of varying mode presentation of clinical information upon three dependent variables, which included: (a) a cued recall task, (b) a multiple choice test, and (c) a rating of participants' satisfaction with the modality with which they were presented. The levels of the independent variable were: (a) print, (b) audiotape, and (c) videotape.

The first three experiments served as studies which (a) aided in development of the multiple choice test and (b) evaluated the ecological validity of the levels of the independent variable, and (c) the face and content validity of the dependent variables which were used in the fourth experiment. The goal of Experiment 1 was to empirically select appropriate questions for the multiple choice test by eliminating questions that a high proportion of participants not exposed to the experimental manipulation were found to answer correctly.

In Experiment 2, three independent judges evaluated the ecological validity of the narrative in terms of the clarity and relevance of a narrative presented via print, audiotape, and videotape on the topic of Borderline Personality Disorder. The goal of Experiment 3 was to evaluate the face validity and content validity of the dependent variables, which included a cued recall test, a multiple choice test, and a rating of participants' satisfaction with modality. Face validity was evaluated in terms of narrative clarity, whereas content validity was evaluated in terms of the comprehensiveness of the narrative. The three expert judges from Experiment 2 also served as expert judges in Experiment 3.

Experiment 4 utilized (a) the levels of the independent variable evaluated in Experiment 2 and (b) the dependent measures evaluated in Experiment 1 and 3. The goal of Experiment 4 was to evaluate whether the effects of modality on the three dependent measures were consistent across levels of verbal ability, gender, and prior knowledge of the informational content of the independent variable. Because several questions addressed by the current study were exploratory, no hypotheses were offered for the fourth experiment.

CHAPTER 2. EXPERIMENT 1

Method

The goal of Experiment 1 was to empirically select appropriate questions for the multiple choice test by eliminating questions that more than 30% of participants not exposed to the content of the independent variable were found to answer correctly.

Participants

Fifty-five students recruited from undergraduate psychology classes at the University of Hawaii served as participants in this study. A consent form was obtained from each participant (see Appendix B). Each participant earned extra credit points in return for participation in this experiment. Of the 55 participants in this study, a subset of 35 participants completed part one of the study, which evaluated the initial 22-item multiple choice test. The remaining 20 participants took part in part two of the study, which evaluated a revised version of the multiple choice test which had 21 items. Summary statistics regarding participants' age, gender, class and ethnicity are reported for individuals in part one and part two of this experiment in Tables 1 and 2 respectively.

Materials

Participant Information Sheet. A Participant Information Sheet (see Appendix C) was used to obtain information about participants' age, gender, major, class level, and ethnic background.

22-Item Multiple Choice Test. The 22-item multiple choice test was the first version of this measure evaluated in this study (see Appendix D). This measure was designed to assess the content of the narrative "Living with Borderline Personality Disorder: Josie's Story" (see Appendix E). Each question consisted of a question stem followed by one correct answer and three incorrect answers in mixed order.

21-Item Multiple Choice Test. The 21-item multiple choice test (see Appendix F) was a revised version of the 22-item multiple choice test. The 21-item multiple choice test consisted of (a) 11 of 22 items selected from the 22-item multiple choice test which no greater than 30% of the participant sample in part one of the experiment answered correctly and (b) 10 new items which also concerned the narrative on Borderline Personality Disorder. An additional answer option was added to the 11 questions from the original 22-item multiple choice test to allow for all multiple choice test questions to have 5 potential answer choices.

Thus, all items contained one question stem, followed by one correct answer and four incorrect answers in mixed order.

Procedure

Experiment 1 was conducted in two parts. In part one, 35 participants completed a consent form, an information sheet, and were then instructed to complete the 22-item multiple choice test. Participants were not exposed to the content of the narrative "Living with Borderline Personality Disorder: Josie's Story."

In part two, 20 different participants completed a consent form, information sheet, and were instructed to then complete the 21-item multiple choice test, which was revised based on the 35 participants' responses in part one of this experiment. As in part one of this experiment, participants in part two were not exposed to the content of the narrative "Living with Borderline Personality Disorder: Josie's Story."

Results

Part One. The percentage of items on the 22-item multiple choice test scored correctly by participants not exposed to the content of the narrative is reported in Table 3 by item number. As seen in the table, the percentage of correct answers obtained for each item

ranged from 15% (i.e., item 12) to 85% (i.e., item 8). Eleven items which yielded a high proportion of correct answers (i.e., greater than 30%) were eliminated from the item pool altogether (i.e., items 1, 4, 5, 7, 8, 9, 10, 11, 15, 19, 22). Given the relatively small number of remaining items, 10 new items were generated and added to create the 21-item multiple choice test. To increase the difficulty level of the remaining items, one additional response item was added to the list of multiple choice items, such that participants selected the correct answer from five choices.

Part Two. The percentage of answers scored correctly by participants who completed the 21-item revised multiple choice test is reported in Table 4 by item number. As seen in the Table, the percentage of correct answers for each item ranged from 5% (i.e., item 1) to 80% (i.e., item 15). Six items which yielded a high proportion of correct answers (i.e., greater than 30%) were eliminated from the item pool (i.e., items 5, 11, 15, 16, 17, 20). These revisions yielded a final multiple choice test consisting of 15 items (see Appendix G).

CHAPTER 3. EXPERIMENT 2

Method

The purpose of this experiment was to evaluate the ecological validity of the levels of the narrative used in Experiment 4. The narrative was adapted from Lansky (1988) on the topic of Borderline Personality Disorder (see Appendix E), and was entitled "Living with Borderline Personality Disorder: Josie's Story". The narrative was reproduced in three stimulus modalities: print, audiotape, and videotape.

Participants

Participants were two Ph.D-level clinical psychologists and one doctoral candidate in clinical psychology.

Materials

Independent Variable

The narrative in this study was adapted from a narrative originally used by Lansky (1988). Yim (1995a) modified the narrative content (a) to be consistent with current diagnostic criteria for Borderline Personality Disorder (DSM-IV; American Psychiatric Association, 1994) and (b) to eliminate redundancies and simplify language. As already indicated, the narrative was reproduced in three stimulus

conditions: print, audiotape, and videotape. Enhancements to each modality were made to maximize the communicative efficacy of each modality, and to make the print, audiotape, and videotape versions of the narrative more socially and ecologically valid.

Print condition. The print condition consisted of a 9-page brochure on the topic of Borderline Personality Disorder (see Appendix E). The brochure employed principles of good layout to maximize interest in the informational content, and used design features (e.g., varying type size) to emphasize important points.

Videotape condition. The videotape condition consisted of a videotape having identical informational content to the brochure, and utilized a mixed format with a speaker in talking head format and film pictures. The speaker in the videotape used vocal inflection and facial expression for emphasis to increase interest in the content of the narrative. The duration of the videotape was 17 minutes.

Audiotape condition. The audiotape condition consisted of the audio portion of the videotape to allow for maximum comparability across modalities. The duration of the audiotape was 17 minutes.

Rating scales for the narrative

The quality of the three levels of the narrative were evaluated using 5-point Likert scales (see Appendix H). Criteria applied to each mode of presentation evaluated the extent to which each modality was clearly presented (i.e., clear print, adequate sound, limited noise and interference). Criteria also evaluated the extent to which the narrative was: (a) credible, (b) sufficiently variable in content to allow variability in dependent variables' scores (cued recall and multiple choice test), (c) representative of a knowledge base beyond the realm of participants' general knowledge about psychology, (d) equally amenable to each mode of presentation, and (e) ecologically valid.

Procedure and Data Analysis

Two Ph.D-level clinical psychologists and one doctoral candidate in clinical psychology served as independent judges in this study. A consent form was obtained for each subject (see Appendix I).

Each judge completed an independent assessment. Each judge received a copy of the printed brochure, the audiotape, and the videotape, and viewed the levels of the narrative in counterbalanced order. Judges used Likert scales to rate the levels of the narrative on the criteria listed above. A criterion was considered

to be met if it obtained a minimum rating of 4 on a 5-point scale from each judge.

Results

Independent judges' ratings of the quality of the levels of the narrative met the 4-point criterion specified a priori. Mean judges' ratings on each item are presented in Table 5, and ranged from 4.33 (*SD* = 0.58) to 5.00 (*SD* = 0.00).

CHAPTER 4. EXPERIMENT 3

Method

The purpose of Experiment 3 was to evaluate the face and content validity of the dependent measures used in Experiment 4. Measures included the: (a) cued recall task (see Appendix J) and cued recall scoresheet (see Appendix K), (b) 15-item multiple choice test (see Appendix G) and multiple choice test scoresheet (see Appendix L), and (c) Measure of Participant Satisfaction (see Appendix M). All dependent measures were rationally developed by the current author and are described below.

Participants

Two Ph.D-level clinical psychologists and one doctoral candidate in clinical psychology at the University of Hawaii-Manoa served as independent judges for this experiment. Participants who served as independent judges in Experiment 2 also served as independent judges in Experiment 3.

Materials

Each judge was provided with (a) a printed version of the narrative, (b) the cued recall task and scoresheet, (c) the multiple choice test and scoresheet, and (d) the Measure of Participant Satisfaction.

The cued recall task consisted of 10 questions on

key points in the narrative; the scoresheet included a listing of points awarded for appropriate answers. The multiple choice test consisted of 15 questions on key points in the narrative followed by a list of five answers in a multiple choice format. The Measure of Participant Satisfaction consisted of five questions that asked participants to (a) rate the quality of the version of the narrative that they were presented with (i.e., print, audiotape, or videotape), (b) indicate how much they felt they learned from the narrative, and (c) additionally answer two exploratory questions referring to overall modality preference that were not scored. Three versions of the Measure of Participant Satisfaction were developed and administered to print, audiotape, and videotape participants. The content of questions were identical across each version, but each particular version had questions which referred specifically to that specific modality of presentation (i.e., the print version asked print participants to rate the quality of the brochure, the audiotape version asked audiotape participants to rate the quality of the audiotape, and the videotape version asked videotape participants to rate the quality of the videotape).

Rating Scales for the Dependent Variables

Each judge was provided with the following criteria with which to evaluate the face and content validity of the dependent measures (see Appendix N). Each judge rated each measure on these criteria using a 5-point Likert scale.

Cued recall task and multiple choice test. To evaluate the face validity of the cued recall task and multiple choice test, each judge rated the extent to which each question was clearly written. To evaluate the content validity of the cued recall task and multiple choice test, each judge rated the extent to which: (a) each question was representative with respect to the independent variable and (b) questions covered the content area adequately.

Measure of Participant Satisfaction. To evaluate the face validity of this measure, each judge assessed the extent to which each question was clearly written.

Procedure and Data Analysis

Two Ph.D-level clinical psychologists and one doctoral candidate in clinical psychology were recruited for participation in this experiment. A consent form was obtained for each subject (see Appendix I).

Each judge received a copy of (a) the narrative in print form, (b) the cued recall task and scoresheet, (c)

the multiple choice test and scoresheet, and (d) the Measure of Participant Satisfaction. Judges independently rated the criteria above on a 5-point Likert scale; a criterion was considered to have been met if a minimum score of 4 on a 5-point scale was obtained from each judge.

Results

Independent judges' ratings of the face and content validity of the dependent measures met the 4-point criterion specified a priori. Judges ratings on each item of the rating scale are averaged and presented in Table 6. As seen in the Table, mean scores on items ranged from 4.67 (SD = 0.58) to 5.00 (SD = 0.00).

CHAPTER 5. EXPERIMENT 4

Design

The fourth and final experiment evaluated whether the effects of modality upon dependent measures (cued recall task score, multiple choice test score, and participant rating of satisfaction with modality) were consistent across levels of participants' Multidimensional Aptitude Battery (MAB) IQ test score, gender, and self-rating of prior knowledge of the informational content of the narrative. Experiment 4 consisted of two sessions lasting approximately one hour each. Participants were recruited from undergraduate psychology classes at the University of Hawaii-Manoa. The manipulated independent variable for this study was modality of information presentation, with three levels: (a) print, (b) audiotape, and (c) videotape. The three different modes of presentation had identical informational content. Three dependent measures were used in the current study: (a) a cued recall task, (b) a multiple choice test, and (c) the Measure of Participant Satisfaction.

Participants

A total of 364 undergraduates were recruited for participation in this study. A consent form was obtained

from each participant (see Appendix B). Each participant earned extra credit points for participation in this experiment. Summary statistics regarding participants' age, gender, class and ethnicity are reported for the sample as a whole (see Table 7), and for participants who were excluded from the study (see Table 8).

Of the 364 participants recruited for this study, data was excluded from 24 participants who did not complete both sessions. Of the remaining 340 participants, data was excluded from 41 participants for the following reasons. First, 10 (24%) participants were randomly deleted from the print condition and 9 (22%) participants were randomly deleted from the audiotape condition to allow for a more equivalent number of participants in each group (i.e., 100 participants each in the print and audiotape groups and 99 participants in the videotape group). In addition, data from 9 (22%) participants were deleted due to either their not reporting crucial demographic information (e.g., age) or having other missing data. Also, data from 9 (22%) participants were deleted because participants were judged to be ineligible, due to their also having participated in Experiment 1 or being below the age requirement (i.e., high school seniors). Finally, data

from 5 (12%) participants was excluded for violation of test protocol (i.e., completing dependent measures out of order) or problems with scoring and interpretation of responses.

Materials

Narrative Independent Variable

As already discussed, the informational content of the three levels of the independent variable (modality) consisted of a modified version of the narrative used in Yim (1995), which was originally adapted from Lansky (1988). The content of the narrative was evaluated for its ecological validity and contextual quality in Experiment 2.

The narrative was reproduced in three stimulus conditions: (a) as a printed brochure, (b) as an audiotape, and (c) as a videotape. The audiotape was presented via a portable cassette recorder. The videotape was presented on a television having a 27-inch screen.

Pretest Dependent Measures

Participant Information Sheet. A Participant Information Sheet was used to obtain information about participants' age, gender, class level, and ethnic background (see Appendix C). Participant demographic information is presented in Table 7 and Table 8.

Multidimensional Aptitude Battery (MAB; Jackson, 1984). Three verbal subscales (Information, Comprehension, and Similarities) of the Multidimensional Aptitude Battery (see Appendix O) were administered as a pretest dependent measure and were used to provide a prorated Verbal subscale score as indicated in the test manual (for a description of procedures used to prorate subscale scores, see Appendix P). The MAB is a written test which can be given in a group format, with instructions read to respondents by the examiner (see Appendix Q). The MAB provides a reliable and valid measure of a broad range of intellectual abilities (Vernon, 1985).

Self-report of Prior Knowledge. Participants were asked to report how much factual knowledge, personal experience and overall knowledge they had about Borderline Personality Disorder and two other disorders (i.e., panic disorder and bipolar disorder; see Appendix R). Questions about two disorders other than Borderline Personality Disorder were included to prevent participants from guessing that this disorder would be the focus of the second session of the experiment. Participants' responses with respect to these two other disorders were not scored. Participants were asked to

rate their prior knowledge of all three disorders on a 5-point Likert scale ranging from "1" ("not at all") to "5" ("a lot"). Questions regarding participants' personal experience and overall knowledge about Borderline Personality Disorder were included as exploratory questions, and were not scored as a part of this experiment. Thus, the only question on this measure which was entered into data analysis concerned participants' factual knowledge of Borderline Personality Disorder.

Posttest Dependent Measures

Cued Recall Task. The cued recall task (see Appendix J) consisted of 10 questions that assessed participants' knowledge of key points of the narrative. Guidelines for scoring the cued recall task are provided in the cued recall task scoresheet (see Appendix K). The total number of points on each question was summed to obtain an aggregate score on this measure.

15-Item Multiple Choice Test. The 15-item multiple choice test (see Appendix G) represented the final version of the multiple choice test that was developed in Experiment 1 and evaluated by independent judges in Experiment 3. The multiple choice test consisted of 15 questions concerning the content of the independent variable, with 1 correct answer, and 4 incorrect answers

listed after each question in mixed order. Each question was worth one point, and the total number of correct answers was summed to obtain an aggregate score on this measure.

Measure of Participant Satisfaction. The Measure of Participant Satisfaction (see Appendix M) consisted of 7 items assessing participants' evaluation of the modality with which they were presented. Two of these items (i.e., items 6 and 7) were exploratory and not scored as a part of this study; items 1 through 5 were summed to obtain a total score on this measure for each participant.

Procedure

A total of 364 participants were recruited for this study from undergraduate introductory psychology classes at the University of Hawaii-Manoa. A consent form was obtained for each subject (see Appendix B). Participants were given extra credit points from their instructors in return for participation. Experiment 4 was comprised of two testing sessions of approximately one hour each, with a group administration format for both sessions. At recruitment, undergraduate participants were asked to sign up for the first session only. Maximum group size for the first session was no larger than 25 participants;

this is consistent with administration requirements for the MAB that no more than 25 individuals be tested per one examiner (Jackson, 1984). In the first session, participants completed a consent form and a Participant Information Sheet. Participants were then administered three verbal subscales of the MAB in a fixed order: the Information subscale, the Comprehension subscale, and finally, the Similarities subscale. Participants then completed the Self-report of Prior Knowledge. After completing these measures, participants signed up for a time to complete the second session of testing, and were blind as to whether the time selected corresponded to the print, audiotape, or videotape condition. The test interval between the first session and the second session was approximately one week.

In the second session, participants were presented with either (a) the printed brochure, (b) the audiotape version, or (c) the videotape version of the independent variable. All participants were told that they would be presented with information on the topic of Borderline Personality Disorder, and that they should remember as much as possible about the information. Immediately following exposure to the independent variable, participants were administered: (a) the Measure of

Participant Satisfaction, (b) the cued recall task, and (c) the multiple choice test. Dependent measures were administered in the above order to prevent information contained in the multiple choice test from biasing participants' responses on the cued recall task. Although none of the above measures had a specific time limit, participants were allotted one hour to complete all of the measures. This length of time was based on the time period it took participants in Yim (1995) to complete the dependent measures in that study.

Results

In terms of predictors, MAB Verbal IQ scores were obtained for each participant by prorating the sum of each participant's subtest scores on the Information, Comprehension, and Similarities subtests of the Multidimensional Aptitude Battery based on guidelines in the test manual (Jackson, 1984). Participants' MAB Verbal IQ scores were then analyzed using the SPSS statistical program to allow participants to be classified into one of four quartiles (for the range of scores corresponding to each quartile, see Table 9). Participants' membership in one of four quartiles was coded to allow for comparisons in the MANOVA discussed below. Mean and standard deviation MAB Verbal IQ scores are provided for

the sample as a whole in Table 10 and by modality group in Table 13.

In terms of dependent measures, total scores were obtained for each participant on the cued recall task and multiple choice test using scoring protocols discussed above. A total score for each participant was also calculated for the Measure of Participant Satisfaction using items 1-5 of this measure. Mean and standard deviation scores on the cued recall task, multiple choice test and Measure of Participant Satisfaction are provided in Table 10. Item analyses for the Measure of Participant Satisfaction that provided the rationale for item selection are described below.

Four sets of preliminary analyses were conducted prior to a MANOVA to address several important issues. As mentioned earlier, the first set of analyses evaluated the correlations among items and item-total statistics for the Measure of Participant Satisfaction to evaluate which items should be included in the total score to maximize the measure's internal consistency. A second set of analyses was conducted to evaluate the extent to which modality groups were equivalent at pretest in terms of (a) MAB Verbal IQ score, (b) self-report of prior knowledge of Borderline Personality Disorder, as well as

(c) proportion of males and females in each group. The third set of analyses evaluated the correlation between participants' self-report of prior knowledge and MAB Verbal IQ score to determine whether there was significant shared variance between these variables. The fourth set of analyses evaluated the correlations among the cued recall task, multiple choice test, and Measure of Participant Satisfaction to determine if the correlations among them were low enough (i.e., less than .80) to allow each measure to be analyzed separately.

Item Correlations on Measure of Participant Satisfaction

A reliability analysis was conducted to address the extent of content redundancy for items of the Measure of Participant Satisfaction. Intercorrelations between items 1-5 ranged from .33 to .69 (see Table 11). An item was retained for the Measure of Participant Satisfaction only if its intercorrelations with other items were less than .80. Since no correlations exceeded this criterion of .80, all 5 items were retained and used in calculating the total score on this measure for each participant. Cronbach's alpha for the 5-item scale was .83, and judged to be in the acceptable range. Item-total statistics provided in Table 12 indicate that the measure's coefficient alpha would be decreased by the removal of

any of the five items, thus providing additional support for the internal consistency of this measure.

Equivalence of Modality Groups at Pretest

Modality groups were compared across participants' levels of MAB Verbal IQ score, gender, and self-report of prior knowledge on the topic of Borderline Personality Disorder to evaluate whether the groups were equivalent at pretest. As noted above, means and standard deviations for the participants' Multidimensional Aptitude Battery Verbal IQ scores are reported for each modality group in Table 13. Means and standard deviations are provided for participants' Self-report of Prior Knowledge scores for each modality group in Table 14. Gender ratios are reported by modality group in Table 15. No significant differences were found between modality groups in terms of participants' MAB Verbal IQ score, $F(2, 296) = 1.78$, $p = .17$ (see Table 13) and likewise, no differences in the proportion of participants classified into MAB Verbal IQ quartiles were found across modality conditions, $(6, N = 299) = 6.57$, $p = .36$. Results of an analysis of variance indicated that there were no significant differences between modality groups at pretest in terms of scores on the Self-report of Prior Knowledge, $F(2, 296) = 0.87$, $p = .42$ (see Table 14). No significant

differences in gender ratio emerged across modality conditions, (2, N = 299) = 1.20, p = .55. It was noted however, that females consistently outnumbered males in an approximately 3:1 ratio across all three conditions (see Table 15).

Analysis of Correlation Between MAB Verbal IQ Scores and Self-report of Prior Knowledge

To address any concern that there might be significant overlap between MAB Verbal IQ scores and Self-report of Prior Knowledge scores, the correlation between participants' scores on each of these measures was examined. Although the correlation between these measures was significant (r = -.18, p = .002, N = 299), the magnitude of the correlation was below .80 and thus the degree of shared variance was judged to be low enough to allow both variables to be retained in the analysis.

Analysis of Correlations Between the Cued Recall Task, Multiple Choice Test, and Measure of Participant Satisfaction

Analysis of the correlation between the cued recall task and multiple choice test indicated that this correlation was significant (r = .55, p = .001, N = 299). Because the correlation between these two measures was not found to exceed .80, each measure was analyzed

separately. A significant correlation was also found between participants' cued recall task scores and scores on the Measure of Participant Satisfaction (r = .27, p < .001, N = 299). Because the correlation did not exceed .80, each of these measures was analyzed separately. Analysis of the correlation between the multiple choice test and Measure of Participant Satisfaction indicated the correlation was significant (r = .12, p = .05, N = 299). However, because the correlation did not exceed .80, each of these measures was analyzed separately.

Multivariate Analysis of Variance

Tables 16-21 summarize the results of the MANOVA evaluating the effects of MAB Verbal IQ, modality, gender, and self-report of prior knowledge upon participants' cued recall scores, multiple choice test scores, and scores on the Measure of Participant Satisfaction. Table 16 provides a summary of the main effects, and two-way and three-way interactions of MAB Verbal IQ, modality, gender, and self-reported prior knowledge upon the cued recall task, multiple choice test, and Measure of Participant Satisfaction.

Table 17 indicates there was no significant effect of MAB Verbal IQ score found on the satisfaction measure, $F(3, 295) = 1.13$, $p = .34$. However, a significant main

effect of MAB Verbal IQ was found on the cued recall task, $F(3, 295) = 8.93$, $p < .0001$, and the multiple choice test, $F(3, 295) = 7.14$, $p < .0001$. For the cued recall task, multiple comparison tests indicated that the performance of the lowest quartile was significantly different from the second, third, and fourth quartiles, suggesting that participants with lower MAB Verbal IQ scores had significantly poorer scores on the cued recall task compared to participants in the rest of the sample. For the multiple choice test, significant differences were found between the lowest quartile and the third and fourth quartiles, also indicating that participants with lower MAB Verbal IQ scores had significantly poorer scores on the multiple choice test than participants who had MAB Verbal IQ scores in the upper two quartiles.

Table 18 also reflects a significant effect of modality for the cued recall task, $F(2, 296) = 19.07$, $p < .0001$, multiple choice test, $F(2, 296) = 13.08$, $p < .0001$, and Measure of Participant Satisfaction, $F(2, 296) = 23.51$, $p < .0001$. As the table indicates, multiple comparison tests yielded superior cued recall task scores for participants in the videotape condition compared to the audiotape condition and the print condition compared to the audiotape condition with no

differences between print and videotape conditions on this measure. Paralleling findings with the cued recall task, superior multiple choice test scores were found for participants in the videotape condition compared to the audiotape condition and the print condition compared to the audiotape condition with no differences between print and videotape conditions on this measure. This pattern of findings was also repeated on the Measure of Participant Satisfaction, with significantly higher scores found for both the videotape and print conditions compared to the audiotape condition, and no differences between print and videotape conditions.

As Table 19 indicates, no significant main effects were found for participants' self-reported prior knowledge of Borderline Personality Disorder on either the cued recall task, $F(4, 294) = 1.66$, $p = .16$, the multiple choice test, $F(4, 494) = 1.99$, $p = .10$, or satisfaction measure, $F(4, 494) = 0.36$, $p = .83$. It is notable that only one participant in the sample reported having an extensive prior knowledge of BPD (i.e., for this level, $n = 1$). When levels 1-2 and levels 3-5 were collapsed into two new levels of prior knowledge respectively, no significant effect of prior knowledge was found, $F(3, 253) = 1.03$, $p = .38$ (see Table 20). On

the cued recall task only, a significant effect was found for gender, $F(1, 297) = 16.68$, $p < .0001$, with a higher mean score for female participants compared to male participants (see Table 21).

Results of the current study did not yield any significant 2-way or 3-way interactions on any dependent measures (see Table 16). Multivariate power and effect size estimates were obtained to evaluate the effects of MAB Verbal IQ score, modality, gender, and prior knowledge and their interactions upon cued recall task scores, multiple choice test scores, and scores on the Measure of Participant Satisfaction (see Table 22). Values for eta squared ranged from .01 to .15, with the majority of values in the .01 to .05 range. Observed power ranged from .17 to .95, but in general was lower for most two-way and three-way interactions compared to power associated with the main effects of MAB Verbal IQ score, modality, and gender.

CHAPTER 6. DISCUSSION

The current study involved a series of four programmatic experiments having the goal to investigate whether MAB Verbal IQ score, modality, gender, and self-reported prior knowledge of Borderline Personality Disorder would have a significant effect on participants' cued recall task scores, multiple choice test scores, and scores on the Measure of Participant Satisfaction. In Experiment 1, two pilot studies were conducted to evaluate the number of multiple choice test items scored correctly by participants who had not been exposed to the content of a narrative on Borderline Personality Disorder. Items that were found to have a high probability of being answered correctly without presentation of the experimental manipulation were eliminated from the item pool. In Experiments 2 and 3, independent judges rated the quality of the levels of the narrative (i.e., print, audiotape, videotape) and the face and content validity of the dependent variables (i.e., the cued recall task, multiple choice test, and Measure of Participant Satisfaction) as exceeding the 4-point criterion specified a priori.

Experiment 4 evaluated (a) the main effects of mode presentation, gender, verbal ability and self-report of

prior knowledge of Borderline Personality Disorder and (b) two-and three-way interactions of these variables upon participants' cued recall task scores, multiple choice test scores, and scores on the Measure of Participant Satisfaction. Results indicated: (a) a significant main effect of modality on the cued recall task, multiple choice test, and Measure of Participant Satisfaction, (b) a significant main effect of MAB Verbal IQ score on the cued recall task and multiple choice test, (c) a significant effect of gender upon the cued recall task only, with (d) no two- or three-way interaction effects for any of the variable combinations and (e) no significant effect of self-reported prior knowledge on any dependent measure. Because significant correlations between (a) the cued recall task and multiple choice test and (b) the cued recall task and satisfaction measure were obtained but not found to exceed .80, each measure was analyzed separately.

Significant Main Effects of Modality and Verbal Ability

Although results of the current study remain to be replicated, findings with respect to mode of presentation raise some interesting implications. For informational clinical content similar to that presented in this study, print and videotape modalities appear to be superior to

audiotape presentations in terms of communicating information so that it is remembered, and also appear to be superior in terms of individuals' self-rated satisfaction with modality. In the current study, print and videotape were not found to be significantly different from each other, but were found to be significantly superior to audiotape presentation across cued recall task scores, multiple choice test scores, and scores on the Measure of Participant Satisfaction. Although this finding was robust, it is notable that the value for eta squared representing the modality effect was only .09 (see Table 22). This estimate is considerably less than .20, which was Cohen's (1977) definition of a small effect size. Such a limited effect suggests that factors other than modality played an important role in participant memory for information and satisfaction with modality in the current study.

It is notable that findings of the current study parallel findings of a previous study (i.e., Yim, 1995a), which found a trend for print and videotape conditions to be superior to audiotape. However, as noted earlier, no firm conclusions in Yim (1995) could be drawn due to low power and small sample size. Importantly, results of the current study differ somewhat from prior findings in the

applied cognitive psychology literature, which found print alone to be superior to audiotape and videotape (e.g., Furnham et al., 1990). While the reasons for this difference in findings are not clear, it is possible that this discrepancy may be due to differences in the content of the informational manipulations. Earlier studies in the applied cognitive psychology literature (e.g., Furnham et al., 1990) used sequences of brief news segments of short duration that were unrelated in content and not designed to be presented together. These materials may have been more difficult to attend to compared to the intervention used in the current study. Earlier studies also allowed print participants to read the content of the independent variable for the duration of the videotape/audiotape stimulus, and researchers have noted this procedure may have allowed for repeated exposures to the informational content for some print participants, increasing the likelihood of superior memory performance for the print condition (Furnham et al., 1990). In contrast, the current study avoided potential multiple repetitions by only allowing print participants to read the narrative once.

In addition to finding a significant effect of modality, another main finding of the current study was a

significant effect of MAB Verbal IQ score on memory indices. Participants with higher MAB Verbal IQ scores had significantly higher scores on the cued recall task and the multiple choice test compared to participants with lower MAB Verbal IQ scores when each measure was analyzed separately. The effect of MAB Verbal IQ score found for the cued recall task is somewhat expected given research indicating that persons with higher verbal ability are better able to manipulate information in short term memory compared to those with lower verbal ability (e.g., Dark & Benbow, 1994). Notably, however, the effect size associated with MAB Verbal IQ in this study was somewhat limited (see Table 22).

In the current study, no effect of self-reported prior knowledge of Borderline Personality Disorder was found on any dependent variables. It is not clear why an effect was not found given the large body of literature documenting a relationship between prior knowledge and memory for information (e.g., Stahl et al., 1989), but it is possible that measurement error in this variable may have been a factor. One potential source of measurement error was the use of a single question asking participants to rate the extent of their knowledge of Borderline Personality Disorder on a 5-point Likert

scale. While this question had content validity, reliability of measurement would have been enhanced through the use of additional questions. For example, the use of specific questions focused upon different aspects of this domain (i.e., causes, treatments or etiology of Borderline Personality Disorder) may have more adequately assessed the prior knowledge domain.

Reliance on subjective report of prior knowledge may have also introduced measurement error into the assessment in several potential ways. First, measurement error may have been introduced if participants had a different understanding of the BPD construct than what was measured in the multiple choice test and cued recall task. Measurement error may have also been introduced if participants were responding to demand characteristics of the experiment. For example, participants may have underreported prior knowledge of BPD due to concerns that their subsequent performance in the experiment would be held to a higher standard, or alternatively, may have overreported their knowledge of BPD because they did not want to be evaluated in a negative light. Without the presence of objective data to test the correlation of participants' subjective responses with their responses on an objective measure, it is difficult to draw any firm

conclusions about these hypotheses. Notably however, the majority of responses on the Self-report of Prior Knowledge were skewed in the direction of participants reporting no knowledge of this disorder (see Table 16), which is more consistent with the first hypothesis. In addressing sources of measurement error, it is also important to consider that participants' report of prior knowledge was collected approximately one week before they were exposed to the intervention and completed dependent measures. Thus, it was also possible that participants may have acquired information about the disorder in the interim.

Although a significant effect was found for gender on the cued recall task, it is noted that females outnumbered males in the participant sample at an approximately 3:1 ratio. It is not clear why a greater proportion of females was found in the study sample. While it is possible that a greater proportion of females in psychology classes at the University of Hawaii are in fact representative of this population as a whole, this information is not available from the University of Hawaii Psychology Department. Given that (a) equal efforts were made to recruit both males and females for this study and (b) participation was voluntary, this 3:1

ratio may have instead reflected the fact that females were more motivated to participate in the study than males. If the gender ratio was due to males being less likely to participate in the study, this could raise questions about the generalizability of study findings with males in study to the population of males as a whole. However, these hypotheses are all speculative.

Impact of Aptitude Variables in Interaction with Modality

No significant interactions between any aptitude variables and modality were found. While this may be interpreted to suggest that the effects of modality were consistent across different levels of verbal ability, prior knowledge and gender, study findings need to be replicated before firm conclusions can be drawn. Results of a power analysis evaluating the main effects and interactions of modality, MAB Verbal IQ score, self-reported prior knowledge and gender upon cued recall task scores, multiple choice test scores, and scores on the Measure of Participant Satisfaction indicated that power ranged from .22 to .52 for all but three interactions (see Table 22), indicating that a researcher would have only a 22% to 52% chance of finding significance for these respective interactions if significance was present. Lower power in this case would not likely be

associated with an inappropriately small sample given that sample size was explicitly guided by recommendations from Cronbach and Snow (1977) to allow sufficient power to detect aptitude-treatment interactions. However, the absence of interaction effects may have instead been due to small sample sizes within cells of the factorial design. It is also possible that the effects of MAB Verbal IQ score, self-reported prior knowledge, and gender in interaction with modality reflected a very small effect size in the current study. The absence of significant interactions may have also been related to problems with how particular variables (i.e., self-reported prior knowledge and MAB Verbal IQ score) were assessed and evaluated, as discussed below.

Limitations of the Current Study

While results of the current study are suggestive, one methodological problem concerned the use of a single question to measure self-reported prior knowledge of Borderline Personality Disorder. Since reliability was probably decreased through the use of a single question, the addition of more questions regarding treatment or etiology of BPD would be needed to improve assessment of this construct.

Another methodological problem concerned the fact

that results concerning MAB Verbal IQ score are only generalizable to sample populations having similar distributions of scores. Use of a sample drawn exclusively from a college population may have restricted variance upon measures of IQ and prior knowledge, leading to problems with generalizability. In addition, the current study did not allow for participants to be matched on MAB Verbal IQ score and then randomly assigned to modality condition. Such a practice may have improved measurement of verbal ability in this study.

Clinical Implications and Future Directions

Results of the current study support a very small main effect of MAB Verbal IQ score on memory indices and suggest that print and videotape presentations may be superior to audiotape presentations in terms of memory for information and satisfaction with the intervention. Clinical replication to address the methodological problems discussed above is needed to evaluate the effects of MAB Verbal IQ score, modality, self-reported prior knowledge, and gender upon clients' memory for information and satisfaction with modality. Because the current study sample was not drawn from a clinical population, it is not clear whether the effects of MAB

Verbal IQ score, modality, self-reported prior knowledge, and gender upon memory for information and participant satisfaction seen in the current study would replicate with a clinical population. Clinical populations could differ from the current study sample in several ways. First, if clinical participants by definition have more prior knowledge of a disorder, it is possible that the prior knowledge variable might have a different effect on memory indices, though it is important to remember that the effects of self-reported prior knowledge in the current study may have been attenuated by problems with measurement error discussed above. Second, clinical populations are likely to be suffering more significant distress, which might effect their ability to concentrate on memory tasks in the experiment. Finally, clinical participants might have greater motivation and personal incentive to attend to information about a disorder or problem that had a strong affect on their lives compared to participants in our sample. Given it is likely that undergraduate participants in the current study were motivated to participate primarily in order to earn extra credit, one could question their intrinsic motivation to attend to the intervention itself, though of course this point is speculative.

Although results of the current study suggest that print and videotape presentations are equal in efficacy with respect to memory indices and participant satisfaction, considerations other than treatment efficacy may affect the selection of modality in a clinical setting. For example, cost considerations may favor the less expensive modality to produce if both modalities are found to be equally efficacious. Thus, if print and videotape presentations were found to be equal in efficacy, cost considerations could lead a clinician to select print brochures over videotapes since the latter are generally more expensive to produce and require more equipment and professional expertise than would be available to the average clinician.

Clinical researchers might also want to consider whether client preferences for a particular modality might affect the likelihood that a modality will be used by clients in therapy. In the current study, print and videotape modalities were associated with the greatest satisfaction ratings among participants, but assignment to modality was experimentally controlled, and satisfaction ratings were collected post hoc. It is important to note that greater post hoc satisfaction ratings obtained in the print and videotape conditions

may have little to do with whether a client will actually use a brochure, audiotape, or videotape in a real life setting. For example, if clients are more likely to watch a videotape than read a brochure, clinicians would do better to focus on developing videotape presentations. Videotape presentations may be more attractive to clients because they may aid them in identifying with a character in the video who has the disorder (Wicklin & Forster, 1994). Thus, client preference for modality and the effects of this on compliance and modality usage are also important issues to consider.

Clinical research should focus on how adjunctive informational materials can best be used in therapy to increase efficiency while decreasing cost, and the impact of using adjunctive informational materials on outcome. A key issue will be how print, audiotape, and videotape presentations of clinical information compare to presentation by a therapist in vivo. Research comparing the efficacy of adjunctive versus live presentations of information having a nonmodeling component could have far reaching implications if adjunctive presentations were found to be at least equivalent or even superior to therapist presentation. To potentially increase efficiency of time spent in therapy, clinical researchers

should (a) identify clinical information that can be best adapted to presentation via print, audiotape, or videotape, and (b) investigate the contribution of these materials to a standard treatment package. Over the past several decades, a large number of manualized, empirically-supported treatments have been developed and disseminated (Chambless & Hollon, 1998). Greater standardization of treatment protocols and increased availability of high quality self-help materials may create more opportunities for clients to receive information about the process of therapy, and thus may drive research to consider what format might be best and most efficiently used to present this information to clients. Computer and internet applications of therapy techniques (which may include a combination of print, audiotape, and videotape modalities) are one example of a growing trend towards developing efficient alternative presentations of therapy content that would ordinarily require presence of a therapist (Marks, 1997).

Exploiting the potential capacity for presenting adjunctive information to clients in therapy will make an important contribution towards increasing the cost effectiveness of therapy time when such considerations are foremost. Research is needed to guide selection of

how informational materials are presented and under what conditions learning and satisfaction with information presentation are maximized. Results of the current study, while requiring further replication, represent a first step in evaluating the extent to which particular modes of presentation can be manipulated to improve memory for information and satisfaction with the way in which information is presented. The current study documented a significant effect of modality upon memory indices and on participants' self-rated satisfaction with modality; notably, however, the magnitude of these effects was relatively small, suggesting the influence of other variables not examined in this study. At present, results of the current study do not provide evidence that individual difference variables such as MAB Verbal IQ score, gender or prior knowledge have an effect on the selection of modality, although methodological limitations in the current study would need to be remedied before any firm conclusions could be drawn. Researchers would do well to consider the wide range of clinical contexts to which such supplemental informational materials could be applied, especially in light of increasing development and dissemination of empirically-supported treatments. In evaluating how

informational materials should be presented in a clinical context, researchers should go beyond issues of efficacy to consider issues like cost, client preference, and the effects of preference on treatment compliance.

Table 1. Characteristics of Participants Included in Part 1 of Experiment 1

Demographic Variables	*M* (*SD*)	*n* (%)
Age	22.45 (2.44)	
Gender		
Male		11 (55)
Female		9 (45)
Class Level		
Freshman		0 (0)
Sophomore		4 (20)
Junior		7 (35)
Senior		9 (45)
Ethnicity		
Chinese		2 (10)
Japanese		4 (20)
Korean		1 (5)
Filipino		1 (5)
Southeast Asian		0 (0)
Portuguese		0 (0)

Table 1. (Continued) Characteristics of Participants Included in Part 1 of Experiment 1

Demographic Variables	*M* (*SD*)	*n* (%)
Ethnicity		
Caucasian		3 (15)
Hispanic		0 (0)
African American		0 (0)
Hawaiian		0 (0)
Native American		0 (0)
Pacific Islander		0 (0)
Other		0 (0)
Mixed Ancestry		9 (45)

Table 2. Characteristics of Participants Included in Part 2 of Experiment 1

Demographic Variables	*M* (*SD*)	*n* (%)
Age	21.14 (5.46)	
Gender		
Male		12 (34)
Female		23 (66)
Class Level		
Freshman		12 (34)
Sophomore		9 (26)
Junior		9 (26)
Senior		5 (14)
Ethnicity		
Chinese		1 (3)
Japanese		13 (37)
Korean		2 (6)
Filipino		0 (0)
Southeast Asian		0 (0)
Portuguese		0 (0)

Table 2. (Continued) Characteristics of Participants Included in Part 2 of Experiment 1

Demographic Variables	*M* (*SD*)	*n* (%)
Ethnicity		
Caucasian		6 (17)
Hispanic		0 (0)
African American		0 (0)
Hawaiian		0 (0)
Native American		0 (0)
Pacific Islander		1 (3)
Other		0 (0)
Mixed Ancestry		12 (34)

Table 3. Percent of 22-item Multiple Choice Test Items Scored Correctly by Participants in Part One of Experiment 1

Question number	Percent correct
1	80
2	35
3	20
4	65
5	50
6	30
7	85
8	85
9	65
10	70
11	75
12	15
13	40
14	45
15	85
16	20
17	15
18	30
19	80

Table 3. (Continued) Percent of 22-item Multiple Choice Test Items Scored Correctly by Participants in Part One of Experiment 1

Question number	Percent correct
20	30
21	30
22	50

Note. Items having more than 30% of sample endorse correct response were removed from the final item pool.

Table 4. Percent of 21-Item Revised Multiple Choice Test Questions Scored Correctly by Participants in Part Two of Experiment 1

Question number	Percent correct
1	6
2	9
3	29
4	11
5	54
6	17
7	11
8	20
9	20
10	11
11	51
12	29
13	17
14	26
15	80
16	37
17	51

Table 4. (Continued) Percent of 21-Item Revised Multiple Choice Test Questions Scored Correctly by Participants in Part Two of Experiment 1

Question number	Percent correct
18	29
19	11
20	43
21	23

Note. Items having more than 30% of sample endorse the correct response were removed from the final item pool.

Table 5. Mean Item Scores on Rating Scale for Independent Variable

Item	M	SD
1. Print quality	5.00	0.00
2. Audiotape quality	4.33	0.58
3. Videotape quality	4.67	0.58
4. Narrative credibility	4.67	0.58
5. Content variability	4.67	0.58
6. Content representative	5.00	0.00
7. Content equally amenable	4.67	0.58
8. Print ecological validity	4.67	0.58
9. Audiotape ecological validity	4.67	0.58
10. Videotape ecological validity	4.67	0.58

Table 6. Mean Item Scores on Rating Scale for Dependent Variables

Measure and Item	M	SD
Cued Recall Task		
1. Clearly written	5.00	0.00
2. Representative	4.67	0.58
3. Comprehensive	5.00	0.00
4. Vary in detail	4.67	0.58
Multiple Choice Test		
1. Clearly written	5.00	0.00
2. Representative	5.00	0.00
3. Comprehensive	5.00	0.00
Satisfaction Measure		
1. Clearly written	5.00	0.00

Table 7. Characteristics of Participants Included in Experiment 4

Demographic Variables	M(SD)	n (%)
Age	22.06 (6.18)	
Gender		
Male		77 (26)
Female		222 (74)
Class		
Freshman		71 (24)
Sophomore		60 (20)
Junior		76 (25)
Senior		81 (27)
Unclassified Graduate		10 (3)
Ethnicity		
Chinese		23 (8)
Japanese		80 (27)
Korean		14 (5)
Filipino		25 (8)
Southeast Asian		2 (1)
Portuguese		0 (0)

Table 7. (Continued) Characteristics of Participants Included in Experiment 4

Demographic Variables	M(SD)	n (%)
Caucasian		47 (16)
Hispanic		1 (1)[a]
African American		3 (1)
Hawaiian		0 (0)
Native American		0 (0)
Pacific Islander		2 (1)
Other		5 (2)
Mixed Ancestry		97 (32)

Note. [a] represents actual calculated percentage equal to less than 1%.

Table 8. Characteristics of Participants Excluded from Experiment 4

Demographic Variables	M(SD)	n(%)
Age	21.03 (4.07)	
Gender		
Male		22 (33)
Female		42 (63)
Class		
Freshman		18 (27)
Sophomore		9 (13)
Junior		12 (18)
Senior		21 (31)
Unclassified Graduate		1 (1)
High School Senior		3 (5)
Ethnicity		
Chinese		8 (12)
Japanese		15 (22)
Korean		2 (3)
Filipino		6 (9)

Table 8. Characteristics of Participants Excluded from Experiment 4

Demographic Variables	M(SD)	n(%)
Southeast Asian		0 (0)
Portuguese		0 (0)
Caucasian		5 (8)
Hispanic		2 (3)
African American		0 (0)
Hawaiian		1 (2)
Native American		0 (0)
Pacific Islander		1 (2)
Other		1 (2)
Mixed Ancestry		22 (33)

Table 9. Multidimensional Aptitude Battery Verbal IQ Scores by Quartile

Quartile	*n* (%)	Observed Range	*M* (*SD*)
1	73 (24.40)	79-102	94.31 (6.26)
2	71 (23.70)	103-111	106.61 (2.57)
3	84 (28.10)	112-122	117.01 (3.49)
4	71 (23.70)	123-145	128.30 (4.34)

Table 10. Mean Scores on the Multidimensional Aptitude Battery, Self-Report of Prior Knowledge, Cued Recall Task, Multiple Choice Test, and Measure of Participant Satisfaction for the Entire Sample

Measure	M	SD	Observed Range
Multidimensional Aptitude Battery			
Verbal IQ	111.68	13.14	79.00 - 145.00
Self-Report of Prior Knowledge	1.75	1.04	1.00 - 5.00
Cued Recall Task	27.36	7.41	5.00 - 53.00
Multiple Choice Test	10.10	2.94	0.00 - 15.00
Measure of Participant Satisfaction	18.59	3.14	9.00 - 25.00

Table 11. Inter-item Correlation Coefficients for Measure of Participant Satisfaction

	Item 1	Item 2	Item 3	Item 4	Item 5
Item 1	1.00				
Item 2	.59	1.00			
Item 3	.45	.52	1.00		
Item 4	.52	.45	.33	1.00	
Item 5	.56	.49	.42	.69	1.00

Table 12. Item-total Summary Statistics for Measure of Participant Satisfaction

Item	Corrected Item-total Correlation	Alpha if Item Deleted
1	.67	.78
2	.63	.79
3	.51	.82
4	.64	.80
5	.72	.76

Table 13. Mean Multidimensional Aptitude Battery Sum of Scaled Scores and Prorated Verbal IQ by Modality Group

Group	Sum of Scaled Scores	Verbal IQ
Print		
(*n* = 100)		
M (*SD*)	273.93 (27.01)	112.73 (12.25)
Observed		
Range	202.00-332.00	84.00-138.00
Audiotape		
(*n* = 100)		
M (*SD*)	274.64 (32.55)	112.64 (14.04)
Observed		
Range	177.00-334.00	79.00-139.00
Videotape		
(*n* = 99)		
M (*SD*)	270.06 (28.79)	109.65 (12.97)
Observed		
Range	195.00-346.00	83.00-145.00

Note. For Sum of Scaled Scores, $F(2, 296) = 0.69$, $p = .50$. For Prorated Verbal IQ Scores, $F(2, 296) = 1.78$, $p = .17$.

Table 14. Mean Self-Report of Prior Knowledge Scores for the Full Sample and by Modality Group

Group	M	SD	Observed Range
Full Sample (n = 299)	1.75	1.04	1.00-5.00
Print (n = 100)	1.72	1.07	1.00-4.00
Audiotape (n = 100)	1.67	1.00	1.00-4.00
Videotape (n = 99)	1.86	1.06	1.00-5.00

Note. $F(2, 296) = 0.87$, $p = .42$.

Table 15. Gender Ratios for the Full Sample and by Modality Group

Group	Male n (%)	Female n (%)
Full Sample (n = 299)	77 (26)	222 (74)
Print (n = 100)	26 (26)	74 (74)
Audiotape (n = 100)	29 (29)	71 (71)
Videotape (n = 99)	22 (22)	77 (78)

Note. (2, N = 299) = 1.20, p = .55.

Table 16. Multivariate Effects of MAB Verbal IQ Score, Modality, Gender and Self-Report of Prior Knowledge Upon the Cued Recall Task, Multiple Choice Test, and Measure of Participant Satisfaction

Source	Wilk's Lambda	F
MAB Verbal IQ (I)	.85	4.05*
Modality (M)	.72	13.31*
Prior Knowledge (P)	.94	1.10
Gender (G)	.92	6.62*
I x M	.93	.92
I x P	.89	.95
I x G	.96	.44
M x P	.92	.99
M x G	.99	.40
P x G	.96	1.05
I x M x P	.83	1.02
I x M x G	.97	.44
I x P x G	.95	.68
M x P x G	.93	1.03
I x M x P x G	.92	1.50

Note. *p < .0001.

Table 17. Mean Scores on the Cued Recall Task, Multiple Choice Test, and Measure of Participant Satisfaction for Four MAB Verbal IQ Quartiles

	Quartile				
Measure	1	2	3	4	$F(3,295)$
Cued Recall Task					
M	24.22 a	27.34 b	28.14 b	29.68 b	8.93*
SD	8.26	6.86	6.76	6.78	
Multiple Choice Test					
M	8.89 a	10.42	10.19 b	10.93 b	7.14*
SD	3.11	3.05	2.87	2.31	
Measure of Participant Satisfaction					
M	18.41 a	19.15 a	18.46 a	18.37 a	1.13
SD	3.00	3.21	3.06	3.30	

Note. The values for F above represent univaviate F statistics following a significant multivariate F. Means marked with a subscript differ at $p < .05$ in the Tukey HSD comparison.

For quartile 1, $n = 73$. For quartile 2, $n = 71$.

For quartile 3, $n = 84$. For quartile 4, $n = 71$.

*$p < .0001$.

Table 18. Mean Scores on the Cued Recall Task, Multiple Choice Test, and Measure of Participant Satisfaction for Print, Audiotape, and Videotape Modalities

	Modality			
Measure	Print (n = 100)	Audiotape (n = 100)	Videotape (n = 99)	$F(2, 296)$
Cued Recall Task				
M	29.27 a	24.23 b	28.59 a	19.07*
SD	6.40	7.75	7.04	
Multiple Choice Test				
M	10.26 a	9.11 b	10.95 a	13.08*
SD	2.71	2.98	2.83	
Measure of Participant Satisfaction				
M	19.61 a	16.93 b	19.24 a	23.51*
SD	2.69	3.29	2.73	

Note. The values for F above represent univaviate F statistics following a significant multivariate F. Means marked with a subscript differ at $p < .05$ in the Tukey HSD comparison.

*$p < .0001$.

Table 19. Mean Scores on the Cued Recall Task, Multiple Choice Test, and Measure of Participant Satisfaction for Levels of Self-Reported Prior Knowledge

	Levels				
Measure	1	2	3	4	5
Cued Recall Task					
M	26.90	27.33	28.98	27.90	27.00
SD	7.26	6.90	9.09	6.67	--
Multiple Choice Test					
M	9.92	10.29	10.73	10.17	6.0
SD	2.84	3.01	3.13	3.07	--
Measure of Participant Satisfaction					
M	18.59	18.37	18.54	19.14	17.00
SD	3.05	3.21	3.63	2.99	--

Note. The values for F above represent univaviate F statistics following a significant multivariate F. For the Cued Recall Task, $F(4, 294) = 1.66$, $p = .16$. For the Multiple Choice Test, $F(4, 294) = 1.99$, $p = .10$. For the Measure of Participant Satisfaction, $F(4, 294) = 0.36$, $p = .83$.

Table 19. (Continued) Mean Scores on the Cued Recall Task, Multiple Choice Test, and Measure of Participant Satisfaction for Levels of Self-Reported Prior Knowledge

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For level 1, n = 177. For level 2, n = 51. For level 3, n = 41. For level 4, n = 29. No standard deviation was calculated corresponding to level 5 because n = 1.

Table 20. Mean Scores on the Cued Recall Task, Multiple Choice Test, and Measure of Participant Satisfaction for Two Levels of Self-reported Prior Knowledge

Measure	Level of Prior Knowledge		
	Low (*n* = 228)	High (*n* = 71)	*F*(1, 297)
Cued Recall Task			
M	27.00	28.50	2.25*
SD	7.17	8.08	
Multiple Choice Test			
M	10.00	10.44	1.20*
SD	2.88	3.12	
Measure of Participant Satisfaction			
M	18.54	18.76	0.27*
SD	3.08	3.35	

Note. The values for F represent univaviate F statistics following a significant multivariate F. The lower level group represents level 1 and 2 participants collapsed into a single group. The higher level group represents level 3, 4, and 5 participants who were collapsed into a single group.

*$p > .05$.

Table 21. Mean Scores on the Cued Recall Task, Multiple Choice Test, and Measure of Participant Satisfaction for Males and Females

Dependent Measure	Male	Female	$F(1, 297)$
Cued Recall Task			
M	24.53 [a]	28.34 [b]	16.68*
SD	7.02	7.31	
Multiple Choice Test			
M	9.90 [a]	10.18 [a]	0.26
SD	2.87	2.96	
Measure of Participant Satisfaction			
M	18.12 [a]	18.76 [a]	1.72
SD	3.30	3.07	

Note. The values for F above represent univaviate F statistics following a significant multivariate F. Mean scores marked with a subscript are significantly different from one another. For males, $n = 77$. For females, $n = 222$.

*$p < .0001$.

Table 22. Multivariate Power and Effect Size Estimates for the Effects of MAB Verbal IQ Score, Modality, Gender and Self-Report of Prior Knowledge Upon the Cued Recall Task, Multiple Choice Test, and Measure of Participant Satisfaction

Source	Eta Squared	Observed Power
IQ (I)	.05	.98
Modality (M)	.15	1.00
Prior Knowledge (P)	.02	.57
Gender (G)	.08	.97
I x M	.02	.64
I x P	.04	.82
I x G	.01	.41
M x P	.03	.69
M x G	.01	.17
P x G	.01	.43
I x M x P	.06	.95
I x M x G	.01	.30
I x P x G	.02	.48
M x P x G	.02	.64
I x M x P x G	.03	.75

Appendix A

Abstract and Methods from Yim (1995)

Abstract

Clinical research to date has not examined whether informational materials used in psychotherapy (i.e. those that do not involve a modeling component) are differentially remembered when presented via print, audiotape, or videotape. To evaluate the efficacy of different modes of presentation for clinical content, four programmatic experiments were conducted. In Experiments 1-3, the quality and presentation parameters were established for the independent and dependent measures to be used in Experiment 4. In Experiment 4, 118 subjects were presented with the independent variable either via print, audiotape, or videotape. Subjects then completed a free recall task, cued recall task and post-test questionnaire on this information. Results of a MANOVA indicated no overall significant effect of modality upon free or cued recall. However, low power in the current study prevented us from drawing conclusions about the effects of modality. Factors related to low power and recommendations for future research are discussed.

EXPERIMENT 1

Method

The purpose of this experiment was to evaluate the quality of levels of the independent variable. The independent variable consisted of a narrative adapted from Lansky (1988) on the topic of Borderline Personality Disorder (see Appendix A). The narrative was reproduced in three stimulus modalities: print, audiotape, and videotape. In addition, two different rates of speaking were used in the audiotape modality and the videotape modality. Thus, five forms of the modality were evaluated in this study: (a) the print version, (b) the slower version of the audiotape, (c) the faster version of the audiotape, (d) the slower version of the videotape, and (e) the faster version of the videotape. Because the audiotape versions were recorded from the original videotape versions, the audio portions for the audiotape and videotape were identical.

Subjects

Subjects were three graduate students in clinical psychology, who served as independent judges for this experiment. Prior to participation, judges signed a consent form (see Appendix B) approved by the University of Hawaii Committee on Human Subjects which indicated

that the purpose of this study was to evaluate a narrative for presentation in three modalities to a sample of undergraduate students.

Materials

Independent variable

The independent variable was adapted from a narrative used by Lansky (1988), which was on the topic of Borderline Personality Disorder. The narrative was edited by the current author to eliminate redundancies and simplify language. Also, content describing key characteristics of Borderline Personality Disorder was added to the original narrative to make it more accurate and comprehensive (DSM-IV; American Psychiatric Association, 1994).

As already indicated, the independent variable was reproduced in three stimulus conditions: print, audiotape, and videotape. To assure that the independent variable was equally amenable to each mode of presentation, no materials such as charts, graphs, or pictures were included because they could not be replicated in each modality. Similarly, no enhancements (e.g., nonverbal emotions in facial expressions, tone of voice, or use of printed punctuation as emphasis) were included if they could not be produced in all three modes

of presentation.

Print condition. In the print condition, the narrative was typed on 8 1/2" x 11" sheets of paper, was 1,139 words in length, and equalled six double-spaced pages. Print size was 12 points.

Audiotape condition. In the audiotape condition, an experienced male broadcast journalist read the narrative aloud in a professional, non-dramatic, clinical tone for two different rates of speaking. In the slower version, the narrative was read at a rate of approximately 129 words per minute. In the faster version, the narrative was read at approximately 140 words per minute. The slower version was 8:50 in length, while the faster version was 8:05 in length. The two different speeds were selected by the current author in consultation with an experienced broadcast journalist (Brian Callanan, personal communication, January 26, 1995). The two different versions of the audiotape and videotape differed only with respect to speed.

Videotape condition. In the audiovisual condition, the speaker was videotaped reading the narrative in the talking head format. Since the audio portions of the audiotape and videotape were identical, the rate and duration for the two versions of the videotape are

the same as those reported in the section above.

Rating scales for the independent variable

The quality of the three levels of the independent variable was evaluated using 5-point Likert scales (see Appendix C). Criteria evaluated for each mode of presentation included the extent to which each was clearly presented and of adequate quality (i.e., clear print, adequate sound, limited noise and interference). Criteria also included the extent to which the narrative was: (a) credible, (b) sufficiently variable in content to allow variability in dependent variables' scores (free recall and cued recall), (c) representative of a knowledge base beyond the realm of subjects' general knowledge about psychology, and (d) equally amenable to each mode of presentation. Finally, criteria included the appropriateness of each rate of speaking for the audiotape and videotape.

Procedure and data analysis

Three female graduate students in clinical psychology at the University of Hawaii-Manoa were recruited for participation in this study. A consent form approved by the University of Hawaii Committee on Human Subjects was obtained from each subject.

As already indicated, each judge received five

different versions of the independent variable: (a) a written version, (b) the slower version of the audiotape, (c) the faster version of the audiotape, (d) the slower version of the videotape, and (e) the faster version of the videotape. Each judge completed her assessment independently.

Each judge viewed the levels of the independent variable in counterbalanced order, and used the rating scales provided to evaluate the independent variable. Judges used a 5-point Likert scale to rate the criteria listed above. Prior to the experiment, it was decided that a criterion would be considered to be met with a minimum rating of 4 on a 5-point scale from each judge, and that the narrative would be modified as per judges' feedback and resubmitted until judges' ratings met the minimum score requirement.

Results and discussion

All criteria for the independent variable achieved the minimum rating of 4 on a 5-point scale. Mean judged ratings and standard deviations for each criteria are listed in Table 1. Results of this study established the independent variable to be used in Experiment 4 to be of adequate quality.

EXPERIMENT 2

Method

The purpose of Experiment 2 was to evaluate the clarity and content validity of the dependent measures to be used in Experiment 4. For the evaluation of the free and cued recall measures, judges were provided with: (a) the free recall task checklist, which was a checklist of possible answers for the free recall task (see Appendix D); and (b) the cued recall task scoresheet, which consisted of questions and posssible answers for the cued recall task (see Appendix E). Both the checklist for the free recall task, and the questions and answers for the cued recall task were written in outline form to allow judges to more easily evaluate scoring procedures, and thus were not in the exact format in which they were to be presented to subjects. Judges were also given the post-test questionnaire (see Appendix F), which was in the format in which it was to be presented to subjects.

The free recall checklist was made up of 113 points of information from the narrative, and was utilized to score the free recall task. The cued recall task scoresheet consisted of questions on key points in the narrativethe scoresheet with the appropriate answers. The post-test questionnaire included questions concerning the experiment, and subjects' modality learning

experience. The free recall checklist, cued recall task, and post-test questionnaire were rationally-developed by the current investigator.

Subjects

Subjects were three graduate students in clinical psychology, who served as independent judges for this experiment. These judges had also served as judges in Experiment 1. Prior to participation, subjects signed a consent form (see Appendix B) approved by the University of Hawaii Committee on Human Subjects, which indicated that the purpose of this study was to investigate the adequacy of the memory tasks to be used in Experiment 4 (i.e., the dependent variable of information in print, audiotape, and videotape modalities).

Materials

Dependent Variables

Each judge was provided with (a) a printed version of the independent variable, (b) the free recall checklist, (c) the cued recall scoresheet, and (d) the post-test questionnaire.

As already indicated, the checklist consisted of points of information of the narrative, numbered and written in outline form on four 8 1/2" x 11" sheets of paper. The cued recall task scoresheet consisted of 21

numbered questions covering the content domain of the narrative with the appropriate answers. The post-test consisted of questions that were rationally developed by the current investigator on subjects' experience in the experiment, and on their modality learning experience.

Rating scales for the dependent variables

Each judge was provided with the following criteria with which to evaluate the clarity and content validity of the dependent measures (see Appendix G). Each judge rated each measure on these criteria using a 5-point Likert scale.

Free recall checklist. To evaluate the clarity of the free recall checklist, each judge rated the extent to which each unit on the checklist was clearly written. To evaluate the content validity of the free recall checklist, each judge rated the extent to which: (a) each unit of the free recall checklist was representative with respect to the independent variable, and (b) the checklist covered the content area adequately.

Cued recall task scoresheet. To evaluate the clarity of the cued recall task scoresheet, each judge rated the extent to which each question and answer were clearly written. To evaluate the content validity of the cued recall task, each judge rated the extent to which: (a)

each question was representative with respect to the independent variable, (b) questions covered the content area adequately, and (c) questions varied in the amount of detail required for a correct answer.

Post-test questionnaire. To evaluate the clarity of the post-test questionnaire, each judge assessed the extent to which each question was clearly written.

Procedure and data analysis

Three graduate students in clinical psychology at the University of Hawaii-Manoa were recruited for participation in this experiment. A consent form approved by the University of Hawaii Committee on Human Subjects was obtained for each subject.

Each judge received a copy of the narrative, the free recall checklist, the cued recall task scoresheet, the post-test, and the rating scales with which to evaluate the dependent measures. Judges independently rated the criteria above on a 5-point Likert scale; a criterion was considered to be met if judges' ratings exceeded a minimum score of 4 on a 5-point scale. As was the case in Experiment 1, it was decided that the checklist, cued recall task, and post-test questionnaire would be modified to incorporate judges' feedback and resubmitted for evaluation if a minimum score of 4 from

each judge was not achieved on a criterion.

Results and discussion

All criteria for all three independent variables obtained a minimum score of 4 on a five-point scale. Mean ratings and standard deviations for each criterion are listed in Table 2.

Although judges' ratings did not require a mandatory revision of any of the dependent measures, questions on the cued recall task were modified on the basis of judges' feedback to make them clearer and easier to understand (see Appendix H). Revised questions were discussed with an independent judge (a Ph.D.-level psychologist) until 100% agreement was reached. Results of this study established the dependent measures to be used in Experiment 4 to be of adequate judged clarity and content validity.

EXPERIMENT 3

Method

The purpose of Experiment 3 was to pilot parameters for the print, audiotape, and videotape conditions to be administered in Experiment 4. Experiment 3 utilized a between-subject design; each subject was only exposed to one presentation condition.

The first goal of Experiment 3 was to determine the

90th percentile of the frequency distribution for the amount of time it took print subjects to read the independent variable once. Prior to the experiment, it was determined that the time corresponding to the 90th percentile would serve as the exposure time for the print condition in Experiment 4.

A second goal of this experiment was to obtain group ratings of preference for two different rates of speaking for both the audiotape and videotape conditions. The rate of speaking in the slower version of the independent variable was 129 words per minute; the rate of speaking for the faster version of independent variable was 140 words per minute. Because the audiotape versions were recorded from the original copies on videotape, the audio portions of the audiotapes were identical to their videotaped counterparts.

Subjects signed up for a time to participate in the study, and were blind to the goal of the study and the presentation condition predetermined for that time. Four presentation conditions were evaluated in the current study: (a) slow audiotape, b) fast audiotape, (c) slow videotape, and (d) fast videotape. Mean ratings for rate of speaking in the audiotape and videotape conditions were calculated and compared within mode of

presentation. Prior to the experiment, it had been determined that the version(s) of the audiotape or videotape having the higher mean rating would be used in Experiment 4. This allowed for the possibility that different rates of speaking could be selected for the audiotape and videotape modalities.

In addition to collecting data on the norms discussed above, an additional purpose of Experiment 3 was to pilot dependent measures to be used in Experiment 4. Subjects in all four presentation conditions were administered the free recall task (see Appendix I), cued recall task (see Appendix H), and post-test questionnaire (see Appendix F) with the goal of determining the amount of time it took subjects to complete the entire protocol. Additionally, a sample of subjects' responses on the cued recall task was scored to determine which test questions on the cued recall task would be most likely to discriminate subject performance.

Subjects

Fifty-nine subjects were recruited from undergraduate Psychology classes for participation in this experiment. Prior to participation, subjects signed a consent form (see Appendix J) approved by the University of Hawaii Committee on Human Subjects which

indicated that the purpose of this study was to investigate how people learn. In addition, information was obtained on subjects' age, sex, major, GPA, ethnic background, primary language, and language used in the home (see Tables 3 and 4).

Data from ten subjects who indicated that English was not their primary language was excluded from the analysis. Demographic information on these subjects is included in Tables 4 and 5. Data from the remaining 49 subjects was analyzed in this study.

Materials

A Subject Information Sheet (see Appendix K) was designed to obtain information about subjects' age, sex, major, class level, GPA, and ethnic background.

The independent variable consisted of a narrative modified from Lansky (1988) concerning the characteristics and treatment of Borderline Personality Disorder. The independent variable was reproduced in three modes of presentation: print, audiotape, and videotape.

Print condition

In the print condition, the narrative was typed on six 8 1/2" x 11" sheets of paper, double-spaced, and had a combined word length of 1,139 words. Print size was 12

points. At the end of the narrative, subjects were given written instructions to record the time they finished reading the narrative. The time was displayed on a digital clock that was in clear view of all subjects.

Audiotape condition

The narrative was presented in two different rates of speaking for the audiotape condition. Each rate of speaking was determined in consultation with an experienced broadcast journalist (Brian Callanan, personal communication, January 26, 1995) and was evaluated to be appropriate for subjects by independent judges in Experiment 1. The slower tape had a rate of speaking of 129 words per minute, and was 8:50 in length. The faster tape had a rate of speaking of 140 words per minute, and was 8:05 in length.

Videotape condition

As already noted, the audiotapes in this study were copied from the original copies which were recorded on videotape. Thus, the rates and durations of the two versions of the videotapes were equivalent to that of the audiotapes discussed above.

Procedure

Fifty-nine subjects were recruited for participation in a study entitled "Learning Experiment" from

undergraduate psychology courses at the University of Hawaii-Manoa. Subjects signed up for a time to participate in the study, and were blind to the presentation condition they signed up for. Each subject completed a consent form approved by the University of Hawaii Committee on Human Subjects, and earned extra credit points for participation.

Testing in Experiment 3 was held over nine sessions. Different levels of the independent variable were tested in each session. Each subject participated in only one session.

Three sessions were alloted for the print condition, and data from 18 subjects was obtained. Because four subjects reported English as their second language, these subjects were excluded from the analysis, leaving a total of 14 subjects for the print condition.

In the videotape condition, one session was allotted to pilot the slow version, and one session was allotted to pilot the faster version. Data was obtained from five subjects for each rate of speaking. Data from one subject in the fast condition who reported English being a second language was excluded from the analysis.

In the audiotape condition, data was collected in four sessions, with two sessions allotted for each rate

of speaking. In the first session, nine subjects rated the slow tape. Data from one subject from this group was excluded because English was a second language, and data from another subject was excluded because he reported use of a hearing aid. In the second session, six subjects rated the fast tape. Data from one subject from this group was excluded because English was a second language.

Data was collected in the third and fourth sessions to confirm the findings of the first two sessions. In the third session, nine subjects listened to the slow tape. Data from two subjects in this group was excluded from the analysis; one subject reported English as a second language, and another subject reported not listening to the entire narrative because he was reportedly distracted by the behavior of another subject. In the fourth session, seven subjects listened to the fast tape.

Subjects in sessions 3 and 4 were given revised subject instructions which included a brief outline of topics to be covered in the narrative (e.g., characteristics and treatment of Borderline Personality Disorder). Subject instructions were revised in an attempt to increase retention of information. Revised instructions were given to these subjects because the

instructions were not thought to have an effect on subjects' evaluations of the rate of speaking.

All subjects were presented with the narrative in a group administration format. Subjects were instructed to remember as much as possible about the information presented because they would subsequently be asked to answer questions about the information (see Appendices L and M). Descriptions of specific procedures in each presentation condition are as follows.

Print condition

In the print condition, subjects were instructed to read the narrative at their own pace. On the last page of the narrative, subjects were instructed to write down the time that they finished reading the narrative, as indicated by a digital clock displayed within full view of subjects. As a check to verify that the times that subjects recorded were accurate, the experimenter also timed subjects' reading of the narrative, and recorded this information surreptitiously.

Audiotape condition

For each audiotape condition, the experimenter played either the slow or the fast version of the audiotape on a tape recorder equipped with stereo. After being presented with the audiotape, subjects were asked

to rate the extent to which they felt comfortable with the rate at which the narrative was presented. In addition, subjects were asked to report whether they thought the volume of the audiotape was adequate, too loud, or too soft (see Appendix N).

Videotape condition

For each videotape condition, the experimenter played either the slow or the fast version of the videotape on a 27-inch screen television equipped with a videocassette recorder. After viewing the videotape, subjects rated the extent to which they felt comfortable with the rate of speaking. In addition, subjects were asked to report whether they thought the volume of the videotape was adequate, too loud, or too soft (see Appendix N).

Administration of dependent measures

Dependent measures were administered immediately after exposure to the independent variable for all subjects. Subjects were allotted 9 minutes to complete the free recall task. After completing the free recall task, subjects were given the cued recall task to complete with no time limit. After completion of the cued recall task, subjects were administered the post-test questionnaire, also with no time limit. Average time required to complete the entire protocol was 1 hour and

15 minutes.

Because testing was conducted on audiotape subjects in the third and fourth sessions after the cued recall task was revised (see below), these subjects received the revised cued recall task.

Data analysis

Data on the age, sex, GPA, major, and ethnic background was collected for each subject (see Tables 3, 4, 5, and 6). Subject ratings for the adequacy of the volume of the audiotape and videotape were also obtained.

Evaluation of responses for the cued recall task

Subject responses for a sample of 20 protocols were examined by the current author and an independent judge (a Ph.D.-level psychologist). Questions were excluded from the cued recall task if all or the majority of subjects got the answer either correct or incorrect. On the basis of these criteria, 8 of the 21 questions were eliminated from the cued recall task (questions 1, 4, 6, 10, 12, 14, 15, 19). Information from domains of eliminated questions was incorporated into retained questions to ensure comprehensive representativeness of the narrative's content (see Appendix P). Revisions were discussed with an independent judge (a Ph. D.-level psychologist) until there was 100% agreement.

Exposure time alloted for the print subjects

Data on the length of time it took to read the narrative once was collected from a total of 18 subjects in this condition. Four subjects (22%) were excluded from the analysis because they reported English being a second language on the Subject Information Sheet. A frequency distribution from the remaining 14 subjects was obtained (see Appendix O). The time equivalent to the 90th percentile was determined to be 8:25; this time was used as the exposure time for the print condition in Experiment 4.

Rates of speaking used in the audiotape and videotape conditions

Mean ratings for the rate of speaking in the audiotape and videotape conditions are shown in Table 7. In the audiotape condition, data was collected in four sessions, with two sessions allotted to each rate of speaking. Comparison of ratings from all sessions indicated a trend towards preference for the slow audiotape.

Subjects who were presented with the slower version of the audiotape in the third session of Experiment 3 received the revised cued recall task; therefore their protocol were identical to the subjects in Experiment 4.

Because the protocol were identical, the data of these subjects in Experiment 3 was used as a part of the final analysis in Experiment 4.

In the videotape condition, the faster videotape received a higher mean rating than the slower videotape.

Results and discussion

The current experiment was designed to develop materials and protocol for Experiment 4. In this experiment, we: (a) determined the exposure time to be used for print subjects, (b) determined the rate of speaking for the audiotape and videotape modalities, and (c) collected pilot data on dependent measures.

The 90th percentile of the frequency distribution of the amount of time 14 print subjects took to read the narrative was determined to be 8:25. This time was thus selected to serve as the amount of time print subjects would be exposed to the narrative in Experiment 4.

All subjects presented with the narrative via audiotape and videotape rated the volume of the narrative as being adequate. In both rounds of testing for the audiotape, subjects consistently gave the slower version of the audiotape a higher rating. Therefore, the slower version of the audiotape was selected to be administered to subjects in Experiment 4.

Videotape subjects viewing the faster version of the videotape gave the narrative a higher mean rating than subjects viewing the slower version of the videotape. Subjects' preference for the faster videotape was consistent (a) with the faster videotape earning a higher mean rating from independent judges Experiment 1, and (b) with the judgment of an experienced broadcast journalist that the faster version would be a better rate of speaking for undergraduates (Brian Callanan, personal communication, January 26, 1995). The faster version of the videotape was thus selected to be administered to subjects in Experiment 4.

Ratings indicating a preference for the slow version of the audiotape and the fast version of the videotape were consistent with our hypotheses that subjects' preference for rate of speaking may be dependent on the modality in which it was presented. However, these findings must be interpreted with caution, since subjects were only asked to rate their general satisfaction with rate of speaking, and were not asked to indicate whether they would have preferred a slower or faster rate of presentation. Given that these findings were obtained using a relatively small sample, more research is needed to confirm these findings.

Analysis of a selected sample of subject responses from the cued recall task resulted in the deletion of eight items found to not discriminate pilot subjects. The revised 13-item cued recall task was administered to subjects in Experiment 4.

EXPERIMENT 4

Method

Experiment 4 had two main goals: (a) to determine whether print superiority findings from the mode of presentation literature generalized to clinically-relevant information (Furnham, Benson, & Gunter, 1987; Furnham et al., 1990; Furnham & Gunter, 1985; Furnham & Gunter, 1987; Gunter & Furnham, 1986; Gunter, Furnham & Leese, 1986; Gunter, Furnham, & Gietson, 1984), and (b) to integrate methodological improvements from Experiments 1-3 into the current study.

The current study attempted to replicate the findings of Furnham et al. (1990) with both improved methodology and the addition of clinical content. The selection of levels for the independent variable, format of the two dependent variables, and type of subjects was a replication of Furnham et al. (1990). The current study differed from Furnham et al. (1990) in its use of a narrative adapted from Lansky (1988) on the topic of

Borderline Personality Disorder. This narrative was modified for the current investigation and evaluated to be of adequate quality in Experiment 1.

The independent variable for this study was modality of information presentation, with three levels: print, audiotape, and videotape. The three different modes of presentation had identical informational content. Three dependent measures were used in the current study: (a) a free recall task of nine minutes duration, (b) a cued recall task with no time limit, and (c) a post-test questionnaire with no time limit. Prior to this experiment, these dependent measures were evaluated for their clarity and content validity in Experiment 2.

Subjects

One hundred and eighteen undergraduates were recruited for participation in this study. All subjects signed a consent form (approved by the University of Hawaii Committee on Human Subjects) which indicated that the purpose of the study was to investigate how people learn (see Appendix J). In addition, information was obtained for each subject regarding age, sex, major, GPA, and ethnic background (see Tables 8 and 9).

Demographic information was also obtained from 61 subjects who were excluded from the study (see Tables

10 and 11). Subject data was excluded on the basis of a subject: (a) not having English as a primary language (29%), (b) being a graduate student (5%), (c) having a prior evaluation of learning style (5%), and (d) having prior experience with or exposure to the topic of Borderline Personality Disorder, either through themselves or someone close to them being diagnosed with the disorder or through learning about the disorder in prior classwork (51%).

In addition, data was excluded for subjects whose self-report suggested that their scores were depressed by factors related to the experiment (5%). Data from one subject in the audiotape condition was excluded because he reported not listening to a portion of the audiotape because he was distracted by the behavior of another subject. Data from a second subject in the audiotape condition (who was already excluded on the basis of reporting English as a second language) reported being distracted by a ticking sound heard on the audiotape that no other subject reported as being a problem. Finally, data from one subject in the print condition was deleted because she reported not having read the entire narrative at least once.

Because the above data exclusions left an unequal

number of subjects in each cell, data from three subjects (5%) was randomly deleted to leave an equal number of subjects in each cell (n = 19). One subject was randomly deleted from the audiotape condition, and two subjects were randomly deleted from the videotape condition. Data from 57 subjects was analyzed for this study.

Materials

A Subject Information Sheet (see Appendix K) was designed to obtain information about subjects' age, sex, major, class level, GPA, and ethnic background. Print subjects also completed a questionnaire which asked them to indicate the number of times they read the narrative in the time allotted (Appendix Q).

Independent Variable

As already discussed, the informational content of the three levels of the independent variable (modality) in this experiment was a narrative adapted from Lansky (1988) on the topic of Borderline Personality Disorder. As already indicated, the narrative was modified by the current investigator for use in this study and validated for its quality in Experiment 1.

The narrative was reproduced in three stimulus conditions. In the print condition, the narrative was typed on 8 1/2" x 11" sheets of paper, was 1,139 words

length, and double-spaced to equal six typed pages. Print size was 12 points.

In the audiotape condition, the speaker read the narrative in a professional, non-dramatic, clinical tone at a rate of approximately 129 words per minute. This rate of speaking was selected on the basis of pilot data collected in Experiment 3.

In the audiovisual condition, the same speaker was videotaped reading the narrative in the talking head format at a rate of 140 words per minute. The rate of speaking was selected on the basis of pilot data collected in Experiment 3. The videotape was presented on a television having a 27-inch screen.

Dependent Variables

Dependent variables included scores from the free recall task, cued recall task, and post-test questionnaire which were evaluated in Experiment 2.

Free recall task. For the recall task, subjects were given three sheets of lined paper (entitled "Free Recall Task") having written instructions which told them to write down as much as possible about the information with which they were just presented. Subjects were instructed to number each successive unit of information at the left column of the page and told they would have

nine minutes to complete the task. These instructions were also read aloud to subjects by the experimenter.

The time allotted for the free recall task was slightly longer than the duration of the narrative, a ratio consistent with the exposure time used by Furnham et al. (1990).

The free recall task was scored using the checklist described in Experiment 2. Subjects were assigned two points for each correct item that appeared on the checklist, and one point for each partially correct answer, which is consistent with the protocol used by Furnham et al. (1990). The total number of points equalled the score on the free recall task.

13-item Cued recall task. For the cued recall task, subjects were provided with a set of 13 questions on lined paper (entitled "Cued Recall Task"). Instructions with the task indicated that subjects were to answer the following questions as they related to the narrative. These instructions were also read aloud to the subjects by the experimenter. Subjects were not given a time limit to complete the cued recall task, consistent with the protocol used by Furnham et al. (1990).

The cued recall task was scored by assigning two points for each correct answer, and one point for each

partially correct answer, which is consistent with the scoring protocol used by Furnham et al. (1990). The total number of points equalled the score on the cued recall task.

Post-test Questionnaire. The post-test questionnaire (entitled "Post-Test Questionnaire") consisted of 45 questions, and included screening questions used to exclude subjects. Specific exclusionary questions asked subjects to indicate if they had: (a) been diagnosed with a reading, vision, or hearing problem; (b) been assessed as having a modality strength; (c) prior experience with Borderline Personality Disorder through having a close family member, friend, or themselves been diagnosed with the disorder; or (d) prior exposure to the topic of Borderline Personality Disorder in classwork.

Some exploratory questions on the post-test questionnaire referred specifically to the experiment and were designed to obtain pilot data for future studies evaluating self-report of modality strength and preference. These questions included (a) subjects' estimates of their ability to recall the narrative information presented, (b) memory strategies used during the experiment to recall information, (c) rating of the

material difficulty level, and (d) rating of interest in the material. Other questions assessed subjects' general performance in different modalities. These questions included (a) estimates of their general ability to recall information presented in different modalities, (b) preferences for information presented in different modalities, and (c) frequency of exposure to information in different modalities.

Because the goal of the post-test questionnaire was to provide pilot data for future studies, subjects' responses to these questions were not analyzed as part of the current study. Since these questions were administered last, they were not thought to influence subjects' free recall and cued recall scores.

Procedure

One hundred and eighteen subjects were recruited for this study from undergraduate introductory psychology classes at the University of Hawaii-Manoa. This number of subjects was recruited to allow for attrition and possible rejection of subject data due to exclusionary criteria. A consent form was obtained for each subject. All subjects were given extra credit points for their participation.

Data from six audiotape subjects in session 3 was

also used in the current sample. Their data was used because the protocols in the third session of Experiment 3 were identical to protocol in Experiment 4.

Undergraduates in psychology classes signed up a time to participate in the study, and were blind as to whether the time they chose was a print, audiotape, or videotape condition.

Two different rooms that differed in size were used for testing. This occurred because there was a limited number of rooms to which the video equipment could be transported, and the room which was used for the videotape was judged to be less optimal for presentation of the audiotape and print conditions due to its larger size and slightly louder noise level. To address the concern about noise level, pilot subjects in the videotape condition were asked to indicate if they found the noise level to be distracting. With the exception of one subject who had hearing deficits due to reported history of stroke, all subjects stated that the noise was not at all distracting. Given that noise was not reported to be a problem, it was decided best to use the room that was most suited for each modality. Therefore, the larger room was used for the videotape conditions and the smaller room was used for the print and audiotape

conditions.

Subjects were tested in small groups which mostly ranged from 8-12 subjects per group. Group size was similar to that used in prior research (Berry & Brosius, 1991). Although every attempt was made to equalize the number of subjects per group, room restrictions for presentation of the videotape and subject attrition did not make it possible to achieve this goal. One group contained four subjects, and another group had 21 subjects. Restrictions in subjects' schedules and room availability also made it impossible to schedule testing sessions at the same time of day. Care was taken, therefore, to ensure that session times for each modality were evenly distributed across the different times of day.

Subjects in this study were presented with a narrative adapted from Lansky (1988) which was evaluated in Experiment 1. Subjects in the print condition read the printed version of the narrative. Subjects in the audiotape condition listened to the slower version of the narrative that had a rate of speaking of 129 words per minute. Subjects in the audiovisual group viewed a videotape of a speaker reading the narrative aloud at a rate of 140 words per minute.

All subjects were given the same instructions prior to exposure to the narrative. Subjects were told that they would be presented with information on the topic of Borderline Personality Disorder, and that they should remember as much as possible about the information as possible (see Appendices L and M).

Immediately following exposure to the narrative, subjects were administered the free recall task of nine minutes duration. To prevent the cued recall test from biasing the free recall task, the free recall task was administered first, which was consistent with the protocol followed by Furnham et al. (1990). Following completion of the free recall and cued recall tasks, subjects completed the post-test questionnaire.

Data analysis

Subjects who met exclusionary criteria as indicated on the post-test questionnaire were excluded from the sample. Summary statistics for subjects' age, sex, GPA, major, and ethnic background were calculated, both for subjects who were part of the final sample (see Tables 8 and 9), and for subjects who were excluded from the study (see Tables 10 and 11).

Scoring criteria were developed for the free recall task and cued recall task (see Appendix D and Appendix R)

by the current author in consultation with a Ph.D.-level psychologist. To obtain scoring criteria, a sample of 20 subjects' responses on the cued recall task were independently scored by each rater. Scores for each protocol were discussed until there was 100% agreement. Criteria for 2-point and 1-point answers were derived in this manner. Scoring principles determined from the cued recall task were applied to scoring the free recall task.

The current author scored all free recall task and cued recall task responses using the scoring criteria discussed above. Total scores for the free recall task and for the cued recall task were calculated separately for each subject. On the cued recall task, question 6 was not scored because the wording was judged to be ambiguous by an independent judge (a Ph.D.-level psychologist) after data was collected.

Next, mean scores and standard deviations for the free recall and cued recall tasks were calculated for each level of the independent variable. To determine whether it was appropriate to analyze dependent measures using a MANOVA, a correlation was conducted between the free and cued recall tasks.

Results

Analysis of the print subjects' report of the number

of times they read the narrative in the time elapsed indicated that print subjects differed in the amount of exposures they received to the narrative. One subject (5%) reported not finishing reading the narrative; therefore, her data was deleted from the final analysis. The remaining subjects were retained for the analysis. Of these subjects, ten (50%) reported reading the narrative at least once, but not more than one and one half times. Nine subjects (45%) reported reading the narrative at least one and one half times but not more than twice.

Summary statistics for free and cued recall task scores by modality are reported in Table 12. A MANOVA was used to analyze dependent measures because a correlation conducted between the free and cued recall measures obtained significance (r = 0.65, p < .0001, N = 57). An alpha level of .05 was used for all statistical tests. Results of a MANOVA examining the effect of modality on free and cued recall indicated no significant multivariate differences for the effect of modality, F (4, 106) = 1.54, p = .196 (see Tables 13 and 14).

Appendix B

Consent Form for Experiments 1 and 4

Agreement to participate in learning study

The purpose of this experiment is to evaluate how undergraduates learn information about psychology. This study will be conducted beginning Spring, 1999, and will last approximately one semester.

We do not anticipate there will be any physical or psychological risks associated with this study. Your participation will be most helpful to us if you complete the study in its entirety. However, if at any time you feel uncomfortable with the content or questions of the study, you are free to end your participation. Participation in this experiment is strictly voluntary. You may withdraw from participation at any time without penalty or prejudice. In this experiment, all of your responses will be confidential. Your responses will be used strictly for the purposes of the experiment only. As a subject, you will be assigned a number which will be used to identify your responses. The use of this identifying number will assure that your identity will be kept separate from your responses. If you have any questions, or would like to obtain information about any issues related to the experiment, you may contact the

principal investigator, Letty Yim, at 956-8414 or 574-5396. Information about the results of the study will be available in Spring 2000. Your participation in this experiment will greatly aid us in understanding how people learn information and will help us to make learning environments more effective.

I certify that I have read and that I understand the foregoing, that I have been given satisfactory answers to my inquiries concerning project procedures and other matters and that I have been advised that I am free to withdraw my consent and to discontinue participation in the project or activity at any time without prejudice. I herewith give my consent to participate in this project with the understanding that such consent does not waive any of my legal rights, nor does it release the principal investigator or the institution or any employee or agent thereof from liability for negligence.

_____ _____

Signature of individual participant Date

cc: Signed copy to subject

Appendix C

Participant Information Sheet

1) Name: _____

2) Age : _____

3) Sex : _____ Female _____ Male

4) Class level : _____ Freshman _____ Sophomore

_____ Junior _____ Senior

_____ Graduate student

5) Major : _____

6) GPA : _____

7) Psychology class for which you wish to receive extra credit: (Include class number and name of class) :

_____

8) Instructor's name:

_____

9) Section number of class listed above:

_____

10) Please check all that apply describing your ethnic background:

Chinese ____

Japanese ____

Korean ____

Filipino ____

Southeast Asian ____

Portuguese _____

Caucasian (not Hispanic) _____

Hispanic _____

African-American _____

Hawaiian _____

Native American _____

Pacific Islander _____

Other: _____

11) What is the primary language used in your home?

_____

12) Is English a second language for you?

_____

Appendix D

22-Item Multiple Choice Test

Instructions: Please circle the single best answer from the available choices. Please note that BPD refers to Borderline Personality Disorder.

1. In terms of their relationships with others, people with BPD:
   a. Tend to have excellent long-term relationships with others
   b. Are like most people, in that they have relatively good relationships with others, but can also have periods of conflict
   c. Have unstable relationships with others and go through sudden and dramatic shifts in their feelings about significant others
   d. Tend to be well-liked because they are extroverted and friendly
2. When people with BPD first meet a potential partner, they are likely to:
   a. Immediately begin to idolize that person and share very personal information early on
   b. Become paranoid that the other person will

evaluate them in a negative way

c. Lie to that person to try to impress him/her

d. Try to push the other person away because they do not know how to establish close relationships with others

3. In their relationships with others, people with BPD

a. Are nurturing and empathetic because that is their personality

b. Can be nurturing and empathetic but do this expecting the same treatment in return

c. Do not know how to be nurturing and empathetic because they never experienced this in childhood

d. None of the above

4. If another person is late for an appointment with them, people with BPD are most likely to:

a. Be understanding and forgiving

b. Become furious and panic

c. Be unhappy at first, but later be able to cope with their disappointment

d. Immediately begin thinking of rational explanations for why the person is late

e. a and d

5. One of the things that people with BPD fear most is:

a. Being abandoned by a significant other

b. Becoming too close to someone else

c. Having others criticize them

d. Having a nervous breakdown

6. In terms of emotions, people with BPD

a. Have a hard time expressing their feelings

b. Are often sad or angry

c. Are able to remain calm and even tempered even in the most difficult situations

d. a and c

7. During times of extreme stress, people with BPD

a. React no differently than most people

b. Tend to get upset and highly reactive especially if the stress involves significant others

c. Have a great ability to remain calm and focused

d. None of the above

8. People with BPD

a. Change their goals very suddenly

b. Change their types of friends very suddenly

c. Would never change their goals or types of friends

d. a and b

9. Would you be likely to see a person with BPD make extreme changes in his/her personality (e.g., change from being a helpless victim to a righteous avenger)?

a. Yes; people with BPD are prone to sudden shifts in personality
b. No; people with BPD are no more likely to change than most people
c. No; people with BPD are not likely to make extreme changes because they have rigid personalities
d. The narrative did not indicate how changeable their personalities are

10. When people with BPD are feeling rejected by someone, they typically will:
    a. Rationally discuss these feelings with their partner
    b. Engage in impulsive behaviors (e.g., self-mutilating behaviors) to threaten their partner into staying with them
    c. Will try to pretend nothing is wrong
    d. Will calmly break off the relationship
11. What are some common feelings experienced by individuals with BPD?
    a. Hurt
    b. Happiness and a strong sense of well-being
    c. angry and enraged
    d. a and b

e. a and c

12. People with BPD usually get into conflict with others because:
    a. They refuse to compromise
    b. They do not let others know how they are feeling
    c. They expect others to make up for how they are feeling, as if it is that person's fault that they are having those feelings
    d. All of the above
13. What does the narrative say about the kinds of relationships people with BPD have with others?
    a. People with BPD tend to be very considerate and have good relationships with others
    b. People with BPD don't know how to develop relationships with others because they tend to keep to themselves
    c. People with BPD tend to have a lot of friendships, but these friendships are more superficial
    d. People with BPD often threaten to be violent or engage in self-destructive behaviors to get others to do what they want
14. People with BPD feel others should:
    a. Respect them

b. Give them soothing and special treatment

c. a and b

d. None of the above

15. The significant others of the person with BPD

a. Are more likely to have BPD themselves

b. Are more likely to have serious psychiatric problems

c. Would never leave the person with BPD, no matter what

d. Get frustrated by being abused by the person with BPD and leave the relationship

16. Is the cause of BPD known?

a. No, the cause of BPD is unknown

b. Yes, BPD is due to biological and temperamental factors

c. Yes, BPD is caused by childhood trauma

d. b and c

17. According to the narrative, people with BPD are at risk for:

a. Schizophrenia

b. All psychiatric disorders

c. Suicide

d. b and c

18. How long does a person have BPD?

a. Not very long; it poses a problem for a couple of months, then it goes away forever
b. People get it in childhood, but it usually disappears before adulthood (i.e., mid 20s)
c. Researchers do not know how long it lasts, and no mention of duration of the disorder was made in the narrative
d. It lasts throughout adulthood, but can get better around middle age

19. In order to treat BPD, a therapist will often prescribe:
    a. Medications
    b. Inpatient hospitalization
    c. Electroshock treatments
    d. A combination of a and b, depending on the needs of the patient
    e. A combination of b and c, depending on the needs of the patient
20. According to the narrative, what can a therapist do to learn more about someone with BPD?
    a. Studying 3 generations of the person's family, because patterns tend to repeat themselves over generations
    b. Using hypnosis to uncover unconscious conflicts

c. Spend a lot of time with the person and become their friend

d. a and b

e. b and c

21. What does the behavior of the person with BPD look like in the hospital (i.e., when they are hospitalized)?

a. People with BPD have better relationships with hospital staff than with people outside the hospital

b. People with BPD become more withdrawn in the hospital, and do not interact with anyone

c. The same types of problems that occurred with others outside the hospital also occur with hospital staff

d. None of the above

22. What statement best describes the nature of research on BPD?

a. Researchers do not know the cause or best way to treat BPD

b. Researchers know what causes BPD

c. Researchers know the best way to treat BPD

d. a and b

Appendix E

Narrative on Borderline Personality Disorder

Living with Borderline Personality Disorder: Josie's Story

When Josie was a junior in college, she slit her wrists and tried to overdose on pills because she was terrified her boyfriend would abandon her, and thought this was the only way to keep him. Josie's feelings for Tim went up and down like a roller coaster. Within five minutes of first meeting him, she was convinced that they were destined to be married and that he was the most caring, perfect guy she had ever met. A month later, however, she was accusing him of being cruel and abusive -- not because he abused her, but because he stopped wanting to spend all of his time with her.

This was not the first time that Josie tried to commit suicide over a boyfriend. It had happened twice before. Over time, Josie's boyfriends all had a hard time maintaining a relationship with her because her emotions were so unstable. Also, they never knew what to expect from her because she was always changing her goals, values, and types of friends. Also difficult was the fact that Josie carried around feelings of being cheated and damaged from some negative childhood experiences and

tended to blame those feelings on whomever she was with. Josie had a difficult time maintaining relationships with both men and women because she was very self-centered, and would often engage in dangerous and impulsive behaviors like abusing alcohol or drugs, to try to control others in her relationships.

After her third suicide attempt, Josie was admitted to a psychiatric hospital, where she was diagnosed as having Borderline Personality Disorder (BPD). The purpose of this brochure is to help you to understand what kinds of problems people with BPD experience and what can be done to help them.

It is estimated that about 2 in every 100 people are affected with Borderline Personality Disorder, and like Josie, most people affected with BPD tend to be women. People having a diagnosis of BPD are often very different from one another so that no people are alike. However, many people with BPD experience similar types of problems that are characteristic of the diagnosis. These include:

-- unstable relationships with others
-- frantic attempts to avoid abandonment
-- unstable emotions
-- unstable self-image
-- impulsive behavior

-- recurrent suicidal threats and attempts

Such problems can cause a lot of distress and unhappiness for both the person with this disorder and those around them. But what is it really like for a person to have this disorder? What causes BPD? Once a person has this disorder, do they have it forever? And how can they be treated? These are some questions that this brochure will answer.

What is it Like for a Person to Have BPD? Common Features of this Disorder

1. Unstable and Ever-changing Relationships and Frantic Attempts to Avoid Abandonment

One characteristic of BPD is having a pattern of intense and unstable relationships with others. This pattern occurs because people with this disorder often go through sudden and dramatic shifts in their feelings about significant others. When they first meet a potential friend or partner, they immediately begin to idolize that person, demand to spend a lot of time together and share intimate details of their lives very early on. However, they quickly shift from idolizing that person to harshly criticizing or devaluing him or her -- for not caring enough, not giving enough, or not being there enough. This pattern of intense and unstable

relationships was exhibited by Josie, who always thought she found the "perfect guy" whenever she got into a relationship but then would accuse him of being cruel and uncaring the next month if he didn't want to spend all of his time with her. People with BPD can be nurturing and empathetic to others, but this often done with the expectation that the other person will be there to meet their needs on demand. When others don't reciprocate in the way that they'd like, people with this disorder can often become very upset and demanding.

People with BPD also suffer from an intense fear of abandonment. These fears of abandonment may be connected to their feeling like they cannot stand being alone. They often display inappropriate anger when faced with short term separations or unavoidable changes in plans, and will panic or become furious if a significant other is a few minutes late to meet them or must cancel an appointment. In their frantic attempts to avoid abandonment, people with BPD may also engage in impulsive behaviors such as threatening suicide or other self-destructive behaviors like slitting their wrists. Such behaviors make it hard on significant others.

2. Unstable and Ever-changing Emotions

People with this disorder also may have unstable

emotions. They rarely report experiencing happiness or a sense of well-being, and most often report feeling sad, angry, panicked, or anxious. People with BPD tend to react very strongly to stresses occurring in their relationships with others, and will often express inappropriate anger when they perceive a significant other to be abandoning them or rejecting them. During times of extreme stress, people with BPD may experience brief periods when they start to think that everyone is against them, or they may feel like they are losing touch with reality.

3. Unstable and Ever-changing Self-image

In the same way that they experience sudden and dramatic shifts in their view of others, people with BPD also experience sudden and dramatic shifts in their own self-image, goals, vocation, sexual orientation, and types of friends. For example, it is very common for people with this disorder to undergo dramatic and extreme personality shifts, such as going from a helpless victim to a righteous avenger. While it is not at all unusual for people to change their self-image, goals, vocation, sexual orientation, and types of friends at some point in their lives, people with BPD tend to make radical life changes as a continuing pattern of behavior. To

understand what it would be like for you to have BPD, imagine what your life would be like if you were constantly changing your goals, values, self-image, or types of friends every couple of months. For many people, undergoing all of these constant changes would make life feel pretty chaotic.

People with this disorder may often have an underlying self-image that is based on the idea that they themselves are bad or evil. When they are not in a meaningful relationship, they may also start to feel like they have no identity, that they do not exist at all, and that they are a nonentity.

4. Impulsive, Suicidal, and Self-mutilating Behaviors

People with BPD also tend to engage in impulsive and self-destructive behaviors when they feel they are being rejected by others, or when others demand that they take more responsibility for their actions. Examples of self-destructive, impulsive behaviors include spending money recklessly, binge eating, abusing drugs or alcohol, or engaging in unsafe sex. People with this disorder also tend to engage in self-mutilating behaviors, such as cutting themselves. Suicidal threats or attempts occur in a high percentage of people with BPD, which place them at a high risk. Suicidal behavior often lands them in the

hospital.

Common Inner Feelings Found in BPD

People with BPD often carry around a host of feelings. They often feel:

-- hurt

-- cheated

-- damaged

-- unprepared for life

-- entitled to justice

-- angry and enraged over "wrongs" done to them

-- shame due to disappointments or failures

Some of these feelings may be linked to a specific life experience. For example, people with BPD may feel that a parent or caregiver hurt them, let them down, damaged them in some way, or deserted them. Painful feelings may also be linked to an experience when a spouse or friend who didn't come through. Painful feelings may extend to include all men in general, or all women in general.

Most people have had some disappointments in their lives, and know what this feels like. But most people are not totally obsessed by them. People with BPD are often obsessed with past hurts.

How Their Inner Feelings Cause Conflicts with Others

People with BPD tend to get into conflict with

others because they expect others to make up for how they are feeling -- as if it were that person's fault that they were having those feelings. In this way, people with BPD can be very self-centered. People with this disorder often expect others to make up for past hurts by giving them special privileges, special status, or freedom from responsibility. They often feel it is their right to receive soothing, or special treatment. Others around them often reject these demands, however, because they see people with BPD as demanding, irresponsible, and unreliable.

Methods that People with BPD Use to Control Others

People with BPD try to receive special treatment from others or control them in many unhealthy ways. For example, they may intimidate others, or threaten to be violent. To control others, they may also make suicidal threats, take an overdose of pills, or slash their wrists. Other examples may include making special claims of being "damaged" by a health problem, accident, or war trauma. Any of these unhealthy methods of control may keep others frightened, and willing to give the person with BPD special status, at least for the time being. But people with BPD cannot control others like this forever. Sooner or later, others become frustrated and

worn out, and may even leave the person with BPD. As mentioned earlier, people with BPD do not have stable support systems, and do not behave in ways that foster strong support systems. Spouses feel terrified after years of abuse. Family members feel used, and won't support the person with the disorder any more.

What Causes BPD?

Given the distress experienced by people with BPD, it would be important to know what causes it so that it can be prevented. So what causes this disorder? Unfortunately, psychologists are not completely sure. At present, we do not know what causes some people to have the pattern of unstable relationships, unstable emotions, unstable self-image, impulsive behavior, and intense fear of abandonment that is seen in this disorder. Although people with BPD may share some common situations in their childhood history, there is no one "pattern" that describes their childhoods.

Some people with BPD have reported problems with parents while growing up. Others have had a history of physical or sexual abuse, neglect, conflict, or early loss of their parents. As children, people with BPD may have been in the middle of loyalty struggles with parents where they felt like they, as the child, were to blame.

Many people with this disorder feel that their early lives did not prepare them for being an adult. Others have reported feeling like they didn't have any good role models, or didn't have a family that helped them to feel secure. However, there is no one pattern, and no single known cause. BPD is more likely to be caused by a range of factors.

Can These Problems be Helped? Treatment of BPD

The problems experienced by people with BPD are both distressing and potentially life-threatening, particularly with the high risk of suicide.
BPD tends to be a longstanding disorder that can last until middle age, when symptoms finally seems to improve. Given it is such a distressing and long-term disorder, it is important for us to ask how these problems can be helped in treatment. At present, there is no one "gold standard" treatment. Psychologists still do not have clear answers about what is the most effective treatment for this disorder, and research to study this question is still ongoing. Treatment for this disorder can be complex, and can require several different elements, depending on the seriousness of the problems. Three categories of treatment are generally used with BPD patients:

-- medications

-- psychotherapy

-- hospitalization in an inpatient ward

In Josie's case, medications, psychotherapy and inpatient hospitalization were all used because her repeated suicide attempts made her condition very serious.

Medications

Medication is frequently used in combination with psychotherapy for people with BPD. Medications can provide some relief of symptoms, but cannot cure this disorder. At present, research is still ongoing to determine which medications are best suited for people with BPD. Commons medications include antidepressants and neuroleptics (which are usually used with schizophrenic patients). Although the prescription of medications holds some promise for treating people with BPD, medications must be prescribed with some caution since many people with the disorder are prone to overdose or attempt suicide, and providing them with medications can increase this risk.

Psychotherapy

Psychotherapy is also often prescribed for people with BPD along with medication. Research is still ongoing to determine which types of therapy techniques can be

most beneficial to people with BPD. In general, therapy for BPD aims to: (a) reduce suicide risk, (b) stabilize the patient's life situation, and (c) help the patient to be in better control of her emotions. Therapists can use many different techniques with patients having this disorder. One thing therapists find helpful is to study three generations of the patient's family, because patterns of behavior often repeat themselves across generations. Sometimes people with BPD choose relationships, or are in marriages that turn out to be chaotic or not healthy. These choices can mirror past relationships with a parent or parents with whom the person has a conflict. Thus, the family that the person has started as an adult may repeat the same problems that occurred in the family in which she grew up.

Inpatient Hospitalization

For patients who are a suicide risk, inpatient hospitalization is also used as a part of the treatment. Patients with BPD are often admitted to the hospital when their behavior becomes impulsive and dangerous to themselves or others. Being hospitalized can help to stabilize patients, but patients cannot live in the hospital indefinitely.

What problems arise in the hospital? In the

hospital, many of the same conflicts that have gone on in the person's life are repeated. As patients, they may feel hurt, upset, damaged, and needy. But they may also be demanding, threatening, and manipulative of hospital staff.

Understanding Borderline Personality Disorder

BPD is a distressing disorder that affects about two out of every 100 people. BPD can be seen in a consistent pattern of unstable and intense relationships, emotions, and an ever-changing self-image. Other common problems include impulsive, suicidal and self-mutilating behaviors. BPD causes distress both for the people with the disorder and for those around them. Learning about the characteristics of BPD can helpful to increase understanding and compassion for those individuals and their significant others. Research is ongoing to help psychologists learn more about causes of and treatments for BPD. The goal of this brochure was to provide you with some information about its key features.

Appendix F

21-Item Multiple Choice Test

Instructions: Please circle the single best answer from the available choices. Please note that BPD refers to Borderline Personality Disorder.

1. When people with BPD first meet a potential partner, they are likely to:
    a. Idolize that person
    b. Become paranoid that person dislikes them
    c. Lie to that person to try to impress him/her
    d. b and c
    e. Pretend not to be interested when they really are
2. In their relationships with others, people with BPD
    a. Have difficulty empathizing with others
    b. Do not know how to be nurturing because they did not experience this as a child
    c. Can be nurturing and empathetic but do this expecting the same in return
    d. None of the above
3. One of the things that people with BPD fear most is:
    a. Becoming close to someone else
    b. Having others criticize them
    c. Losing control of their emotions
    d. Being abandoned in a relationship

e. Having a nervous breakdown

4. People with BPD
    a. Have a hard time expressing their feelings
    b. Are often sad or angry
    c. Actually thrive in high pressure situations
    d. Tend to get bored with things quickly
    e. All of the above
5. A person with BPD who is feeling rejected by someone might be likely to:
    a. Try to pretend nothing is wrong
    b. Try to be extra nice to that person to try to get on their good side
    c. Avoid that person
    d. Do something impulsive and controlling
    e. None of the above
6. People with BPD usually get into conflict with others because:
    a. They refuse to compromise
    b. They do not let others know what they are feeling
    c. They expect others to make up for how they are feeling, as if it is that person's fault that they are having those feelings
    d. They cannot see the other person's point of view
    e. All of the above

7. People with BPD
    a. Tend to get into relationships with partners who have similar problems
    b. Have a hard time forming relationships and don't like getting close to others
    c. Often don't know what they want in a relationship
    d. Try to control others
    e. All of the above
8. The significant others of the person with BPD
    a. Are more likely to have BPD themselves
    b. Are more likely to have psychiatric problems in general
    c. Tend to stay with the person with BPD and remain loyal
    d. Often feel abused
    e. None of the above
9. Which statement is true?
    a. Researchers do not know the cause of BPD
    b. Researchers know that BPD is caused by childhood abuse and neglect
    c. Researchers know that BPD is caused by genetic factors
    d. Researchers know that BPD is caused by a particular pattern of interactions the family

e. b, c, and d

10. People with BPD are at risk for:
    a. Schizophrenia
    b. All psychiatric disorders
    c. Suicide
    d. a and c
    e. b and c
11. How long does a person have BPD?
    a. Not long; it tends to go away on its own
    b. Most people get it in childhood, but it tends to disappear in adulthood
    c. It tend to be lifelong and get worse over time d. It can be lifelong, but may get better by middle age
12. What statement is most true:
    a. Antidepressants are the best available treatment for BPD
    b. Electroshock treatments can be used with BPD patients even if they are not suicidal
    c. Patients with BPD are routinely hospitalized even if they are not suicidal
    d. One goal of hospitalization is to help patients get their emotions in control
    e. All of the above
13. What can a therapist do to learn more about a patient

with BPD?

a. Study 3 generations of the person's family
b. Use hypnosis to uncover unconscious conflicts
c. Observe that person's behavior in the hospital
d. Spend a lot of time with that person and become their friend
e. b and d

14. Which statement is most true?

a. People with BPD tend to have better relationships with hospital staff than with people outside the hospital
b. People with BPD tend to be more withdrawn in the hospital and keep to themselves
c. People with BPD tend to have the same types of problems with hospital staff that occurred with others outside the hospital
d. People with BPD tend to form strong bonds with other hospital patients, because other patients can best understand what they are going through
e. a and d

15. What kinds of emotions is a person with BPD most likely to experience?

a. anger
b. anxiety

c. depression

d. a and c

e. all of the above

16. Which statement is false?

a. During times of extreme stress, people with BPD may begin to feel paranoid

b. During times of extreme stress, people with BPD may feel like they are losing touch with reality

c. People with BPD feel like they are bad or evil

d. All of the above statements are false

e. None of the above statements are false

17. If you had an appointment with someone who had BPD, and you were late, what would the person with BPD be most likely to do?

a. Pretend nothing has happened when they see you

b. Try to seem understanding and forgiving

c. Call you on your cellular phone immediately, sounding upset

d. Be a little unhappy at first, but calm down by the time you meet them

e. b and d

18. Which life change would a person with BPD be <u>least</u> likely to make?

a. Getting a new group of friends

b. Getting a radical new "look"

c. Changing sexual orientation

d. Becoming less impulsive

e. All of these changes are equally likely

19. Why are the medications for BPD risky?

a. Few clinical trials have been conducted to determine how safe medications are for use with BPD patients

b. Antidepressants in general tend to have significant side effects

c. Neuroleptics in general tend to have significant side effects

d. Taking medications can be problematic for someone at risk for suicide

e. All of the above

20. Which statement below would a person with BPD be <u>least</u> likely to say?

a. "All men are abusive"

b. "I'm going to get even with her"

c. "I'm ashamed of my failures"

d. "I deserve special treatment"

e. "I must stay who I am and never change"

21. What would not be a goal of psychotherapy for someone with BPD?

a. Stabilizing the patient's life situation

b. Getting off medications

c. Reducing suicide risk

d. Increasing control over emotions

e. Examining patterns of behavior in the family

Appendix G

15-Item Multiple Choice Test

Instructions: Please circle the single best answer from the available choices. Please do your best to answer each question. However, if you do not know an answer, please do not try to guess. When answering each question, please consider the information you were presented with in the narrative. In the questions below, BPD refers to Borderline Personality Disorder.

1. When people with BPD first meet a potential partner, they are likely to:
   a. Idolize that person
   b. Become paranoid that person dislikes them
   c. Lie to that person to try to impress him/her
   d. b and c
   e. Pretend not to be interested when they really are
2. In their relationships with others, people with BPD
   a. Have difficulty empathizing with others
   b. Do not know how to be nurturing because they did not experience this as a child
   c. Can be nurturing and empathetic but do this expecting the same in return
   d. a and b
   e. None of the above

3. One of the things that people with BPD fear most is:
    a. Becoming close to someone else
    b. Having others criticize them
    c. Losing control of their emotions
    d. Being abandoned in a relationship
    e. Having a nervous breakdown
4. People with BPD
    a. Have a hard time expressing their feelings
    b. Are often sad or angry
    c. Actually thrive in high pressure situations
    d. Tend to get bored with things quickly
    e. All of the above
5. People with BPD usually get into conflict with others because:
    a. They refuse to compromise
    b. They do not let others know what they are feeling
    c. They expect others to make up for how they are feeling, as if it is that person's fault that they are having those feelings
    d. They cannot see the other person's point of view
    e. All of the above
6. People with BPD
    a. Tend to get into relationships with partners who have similar problems

b. Have a hard time forming relationships and don't like getting close to others

c. Often don't know what they want in a relationship

d. Try to control others

e. All of the above

7. The significant others of the person with BPD

a. Are more likely to have BPD themselves

b. Are more likely to have psychiatric problems in general

c. Tend to stay with the person with BPD and remain loyal

d. Often feel abused

e. None of the above

8. Which statement is true?

a. Researchers do not know the cause of BPD

b. Researcher know that BPD is caused by childhood abuse and neglect

c. Researchers know that BPD is caused by genetic factors

d. Researchers know that BPD is caused by a particular pattern of interactions in the family

e. b, c, and d

9. According to the narrative, people with BPD are at risk for:

a. Schizophrenia

b. All psychiatric disorders

c. Suicide

d. a and c

e. b and c

10. What statement is most true:

a. Antidepressants are the best available treatment for BPD

b. Electroshock treatments can be used with BPD patients who have very severe forms of the disorder

c. Patients with BPD are routinely hospitalized even if they are not suicidal

d. One goal of hospitalization is to help patients get their emotions in control

e. All of the above

11. According to the narrative, what could a therapist do to learn more about a patient with BPD?

a. Study 3 generations of the person's family

b. Use hypnosis to uncover unconscious conflicts

c. Observe that person's behavior in the hospital

d. Spend a lot of time with that person and become their friend

e. b and d

12. According to the narrative, which statement is most true?
    a. People with BPD tend to have better relationships with hospital staff than with people outside the hospital
    b. People with BPD tend to be more withdrawn in the hospital and keep to themselves
    c. People with BPD tend to have the same types of problems with hospital staff that occurred with others outside the hospital
    d. People with BPD tend to form strong bonds with other hospital patients, because other patients can best understand what they are going through
    e. a and d
13. Which life change would a person with BPD be <u>least</u> likely to make?
    a. Getting a new group of friends
    b. Getting their appearance
    c. Changing sexual orientation
    d. Becoming less impulsive
    e. All of these changes are equally likely
14. According to the narrative, why is it risky to prescribe medications for people with BPD?
    a. Few clinical trials have been conducted to

determine how safe medications are for use with BPD patients

b. Antidepressants in general tend to have significant side effects

c. Neuroleptics in general tend to have significant side effects

d. Taking medications can be problematic for someone at risk for suicide

e. All of the above

15. What was <u>not</u> mentioned in the narrative as a goal of psychotherapy?

a. Stabilizing the patient's life situation

b. Getting off medications

c. Reducing suicide risk

d. Increasing control over emotions

e. Examining patterns of behavior in the family

Appendix H

Consent Form for Experiments 2 and 3

Agreement to participate in learning study

The purpose of this experiment is to evaluate the independent measures and dependent measures to be used in Experiment 4. This study will be conducted beginning Spring, 1999, and will last approximately 1 semester.

We do not anticipate there will be any physical or psychological risks associated with this study. Your participation will be most helpful to us if you complete the study in its entirety. However, if at any time you feel uncomfortable with the content or questions of the study, you are free to end your participation. Participation in this experiment is strictly voluntary. You may withdraw from participation at any time without penalty or prejudice. In this experiment, all of your responses will be confidential. Your responses will be used strictly for the purposes of the experiment only. As a subject, you will be assigned a number which will be used to identify your responses. The use of this identifying number will assure that your identity will be kept separate from your responses. If you have any questions, or would like to obtain information about any issues related to the experiment, you may contact the

principal investigator, Letty Yim, at 956-8414 or 574-5396. Information about the results of the study will be available in Spring 2000. Your participation in this experiment will greatly aid us in understanding how people learn information and will help us to make learning environments more effective.

I certify that I have read and that I understand the foregoing, that I have been given satisfactory answers to my inquiries concerning project procedures and other matters and that I have been advised that I am free to withdraw my consent and to discontinue participation in the project or activity at any time without prejudice. I herewith give my consent to participate in this project with the understanding that such consent does not waive any of my legal rights, nor does it release the principal investigator or the institution or any employee or agent thereof from liability for negligence.

_____ _____

Signature of individual participant Date

cc: Signed copy to subject

Appendix I

Rating Scales for Experiment 1

Instructions: For the following questions, please circle the number corresponding to the descriptors listed below each question. Please use the space provided below each question to indicate specifically what needs improvement.

1) To what extent is the print modality clearly presented and of adequate quality?

1	2	3	4	5
Not at all		Somewhat		To a great extent

Comments:

_____

_____

_____

2) To what extent is the audiotape modality clearly presented and of adequate quality?

1	2	3	4	5
Not at all		Somewhat		To a great extent

Comments:

_____

_____

3) To what extent is the audiovisual modality clearly presented and of adequate quality?

1	2	3	4	5
Not at all		Somewhat		To a great extent

Comments:

_____

_____

_____

4) To what extent is the narrative credible?

1	2	3	4	5
Not at all		Somewhat		To a great extent

Comments:

_____

_____

_____

5) To what extent is the narrative sufficiently variable in content to allow variability in dependent variables' scores?

1	2	3	4	5
Not at all		Somewhat		To a great extent

Comments:

_____

_____

_____

6) To what extent is the content of the narrative representative of a knowledge base beyond the realm of subjects' general knowledge about psychology?

1	2	3	4	5
Not at all		Somewhat		To a great extent

Comments:

_____

_____

_____

7) To what extent is the narrative equally amenable to each mode of presentation?

1	2	3	4	5
Not at all		Somewhat		To a great extent

Comments:

_____

_____

_____

8) To what extent is the printed version of the narrative ecologically valid?

1 2 3 4 5

Not at all Somewhat To a great extent

Comments:

_____

_____

_____

9) To what extent is the audiotape version of the narrative ecologically valid? 1 2 3 4 5

Not at all Somewhat To a great extent

Comments:

_____

_____

_____

10) To what extent is the videotape version of the narrative ecologically valid?

1 2 3 4 5

Not at all Somewhat To a great extent

Appendix J

Cued Recall Task

Instructions

1) Please do your best to answer the following questions according to what you were just presented with in the narrative. We realize that you may have been exposed to information on BPD previously (such as in another class). However, your answers will be most helpful to us if you answer strictly according to what was presented in the narrative.
2) Although one page has been allotted for each question, we do not expect you to use the entire page, and have given you much more space to answer questions than you will need. Please do not feel that you need to use the entire page for each question, and do not feel overwhelmed by the number of pages allotted for this task.
3) Please feel free to answer questions in any order that you choose.
4) In some of the questions, we refer to the number of examples in the narrative which pertain to that question. This is done to aid you in remembering this information. To best answer these types of questions, please write down as many examples as you can

remember.

5) When the question calls for more than one answer, please number each answer.

6) Please do your best to answer each question. However, if you do not know an answer to a question, please do not try to guess. Simply go on to the next question.

7) If any of these questions is not clear to you, please raise your hand and I will come over to talk with you.

8) Please write clearly and legibly. Thank you.

***

Terms used in questions:

-BPD = Borderline Personality Disorder

-Significant other = a person who is close to you, such as a member of your immediate family, girlfriend, boyfriend, or spouse.

1. According to the narrative, what kinds of (a) psychological problems and (b) unpleasant feelings do individuals with BPD commonly experience? Please list as many examples from the narrative as possible.

2. Do individuals with BPD react to disappointing life experiences and feelings in a way that is similar to or different from individuals without BPD? In your answer, please (a) state whether their reactions are similar or different, and (b) explain why you think this is so.

3. What do individuals with BPD expect others to do for them? The narrative provided 4 separate examples of what individuals with BPD expect from others. In your answer, please list as many of these examples as possible.

4. In question 3, you were asked to provide examples of what individuals with BPD expect others to do for them. In this question, we would like you to tell us why individuals with BPD have these particular expectations. According to the narrative, these expectations are due to a belief or attitude that individuals with BPD have. In your answer, please (a) explain what belief or attitude we are referring to, and (b) indicate how having this belief or attitude leads individuals with BPD into "conflict" with others.

5. In the long term, are individuals with BPD ultimately successful in getting others to do what they want? In your answer, please: (a) indicate whether the individual with BPD is successful in the long run, (b) describe the extent to which they are able to control significant others' behavior in the long term, and (c) make a statement about how significant others end up behaving towards them.

6. According to the narrative, a number of unpleasant situations that individuals with BPD might encounter while growing up may contribute to the development of BPD. One example of this was being raised in a family where alcoholism was present. The narrative presented 12 different situations. Please list as many of these 12 situations as possible.

7. Are the problems that individuals with BPD experience during hospitalization (a) different from or (b) similar to the problems they experienced before entering the hospital?

8. Three different types of treatment for BPD were described in the narrative. Please (a) list these types of treatment, (b) indicate what each treatment is designed to do (when this was discussed in the narrative) and (c) indicate the effectiveness of each treatment in curing BPD (when this was discussed in the narrative).

9. What kind of information about the patient with BPD do therapists need to know to be able to treat him or her? At the end of the narrative, one type of information was mentioned as being "crucial" to "facilitate" or aid therapists in treatment. What kind of information are we referring to?

10. In question #9, we asked you to indicate what type of information therapists need to know to best treat individuals with BPD. In question #10, we would like for you to indicate why the narrative said that this type of information was important. The narrative listed 5 separate reasons why this type of information is crucial to the therapist's understanding of the patient. Please list as many of these reasons as possible, and be as specific as you can in your answer.

Appendix K

Cued Recall Task Scoresheet

Instructions

Below each question are scoring criteria for 2-point answers. Examples of 1 and 0 point answers are given to illustrate scoring criteria when available. Generally speaking, answers listed in the 2-point category (and their synonyms) should receive 2 points. Partially correct answers (and their synonyms) should receive 1 point, consistent with WAIS scoring.

One general rule for scoring is that further credit is not given for a partially correct answer when a 2 point answer in that category/cluster has already been scored. Clusters of answers are identified by headings in capital letters to aid scoring. To score, see each question for specific details.

****

1. According to the narrative, what kinds of (a) psychological problems and (b) unpleasant feelings do individuals with BPD commonly experience. Please list as many examples from the narrative as possible.

UNPLEASANT FEELINGS

a. 2 points: (score all that are present)

1) feeling hurt

2) cheated, resentment (resentful)

3) damaged

4) ill prepared for the world

5) entitled to justice; they deserve payback

6) anger

7) rage over injustices done to them

8) shame over patterns in their lives that have been disappointments or failures.

9) let down/disappointed over past life experiences

b. 1 point:

1) feel violated

2) that world owes them something

3) rage (without specifier of it being over injustice dones)

4) that they deserve better

5) that life is unfair

6) betrayed

7) shame

c. 0 points:

1) world is against you/out to get you

2. Do individuals with BPD react to disappointing life experiences and feelings in a way that is similar to or different from individuals without BPD? In your answer,

please (a) state whether their reactions are similar or different.

a. 2 points: different

3. What do individuals with BPD expect others do to for them? The narrative provided 4 separate examples. (Note: answer must describe an action, i.e., what a significant other will do for a person with BPD. Score one answer from each cluster only; score all 4 clusters)

SOOTHING

a. 2 points: should include idea of actively comforting them, making them feel better, such as,

1) soothing, comfort, pity, sympathy, support, understanding, feel for them

b. 1 point: care for them

c. 0 points: nonspecific answers, such as, pay attention to them

PROVIDE EXEMPTION FROM RESPONSIBILITY

a. 2 points: should explicitly include idea of responsibility/blame

1) expect others to be responsible

2) take the blame for problems

b. 1 point: pick up the slack for them

c. 0 point:

1) do what the person with BPD says

2) do things for them

3) help them

4) let them be dependent

5) make things better for them

6) pick up the slack for them

PROVIDE SPECIAL TREATMENT/STATUS/PRIVILEGES

a. 2 points: provide special treatment/status/privileges

b. 1 point: none

c. 0 points:

1) world revolves around them

2) do things for them

COMPENSATE/MAKE UP FOR HOW THEY ARE FEELING

a. 2 points: compensate/make up for how they are feeling

b. 1 points:

1) compensate for their disorder

2) compensate for their past

3) fulfill their missing feelings

4) make things better for them

c. 0 points: none

5. In the long term, are individuals with BPD ultimately successful in getting others to do what they want? In

your answer, please: (a) indicate whether the individual with BPD is successful in the long run, and (c) make a statement about how significant others end up behaving towards them.

(Note: score each cluster. Do not score part (b), which asks subjects to describe the extent to which they are able to control significant others' behavior in the long run)

LONG TERM SUCCESS

a. 2 points: Not successful in long run

SIGNIFICANT OTHER'S BEHAVIOR

a. 2 points: Should convey sense that eventually significant others decide to give up trying
    1) Sooner or later, significant others get frustrated/worn out/leave the relationship
    2) gives up
    3) stop caring
    4) rebuff/reject the individual with BPD.

b. 1 point: conveys the sense that significant other feels negatively towards patient, but does not include sense that significant other has given up
    1) becomes hostile
    2) feels used

3) negatively

6. According to the narrative, a number of unpleasant situations that individuals with BPD might encounter while growing up may contribute to the development of BPD. One example of this was being raised in a family where alcoholism was present. The narrative presented 12 different situations. Please list as many of these 12 situations as possible.

(Note: score all answers present)

a. 2 points:

1) Difficulty with caregivers, parents, family
2) Neglect/deprivation
3) Abandoned/deserted them/parents were absent (but not in sense of divorce)
4) Abused/damaged them in some way
5) Fighting between parents (open or concealed warfare), or constant fighting
6) Loyalty struggles between parents; loyalty problems
7) Patient may have been in the middle of these struggles.
8) Patient may have felt responsible for them.
9) Felt that early life did not prepare them for adulthood.

-parents failed to give them what they thought they needed for adulthood

-parents let them down

-significant other didn't come through for them/No good models for adult life

-deprived of models for adulthood.

10) Deprived of a family that gave them a sense of security

-no sense of security.

-unstable atmosphere

-lack of family support

b. 1 point: problems which approximate and could reasonably be inferred from the above, but could be experienced by any individuals (nonspecific). Also includes terms which were not used or spelled out explicitly in the narrative

1) not enough attention

2) cold, unfeeling home

3) not enough love

4) not enough bonding

c. 0 points:

1) isolation

2) drug abuse

3) growing up in environment where alcohol was present

7. Are the problems that individuals with BPD experience during hospitalization (a) different from or (b) similar to the problems they experienced before entering the hospital?

a. 2 points: similar

8. Three different types of treatment for BPD were described in the narrative. Please (a) list these types of treatment, (b) indicate what each treatment is designed to do, and (c) indicate the effectiveness of each treatment in curing BPD.

(Note: score all answers from each cluster)

Treatment 1: MEDICATION CLUSTER

a. 2 points:

Type of treatment: medication, drugs

Purpose: to treat depression

Effectiveness: must include idea that it is helpful to some extent but does not cure disorder, such as

1) helpful but does not cure disorder

2) temporary results, not a cure

b. 1 point:

Purpose: to treat mood

Effectiveness: temporary solution

c. 0 points:

Effectiveness: not effective

Treatment #2: HOSPITALIZATION

a. 2 points:

Type: Hospital treatment

Purpose: to stabilize patient (must include idea of stabilization), such as,

1) adjust and deal with problems

Effectiveness: shoud include idea of stabilization but that it cannot be a permanent residence or solution, such as,

1) helpful to stabilize patient, but cannot serve as place to live indefinitely (must include idea of stabilization, but only temporary, and not a permanent residence)

b. 1 point:

Effectiveness: temporary

c. 0 points:

Effectiveness: not effective

Treatment #3: FAMILY THERAPY

a. 2 points:

Type: therapy/counseling involving family (if therapy only listed, give 1 point; if family

is mentioned, give 2 points)

9. What kind of information about the patient do therapists need to know to be able to treat him or her? At the end of the narrative, one type of information was mentioned as being crucial to facilitate or aid treatment. What kind of information are we referring to?

a. 2 points: implied understanding that key issue is family history or dynamic

1) information about the patient's family history.

2) information about three generations of the patient's family.

b. 1 point: includes some sense of family as unit of importance but does not express idea of dynamic as being key

1) childhood and past relationships and family life

2) family life experiences

c. 0 points: non specific answers

1) information about childhood

2) childhood experience

3) background information

10. In question #9, we asked you to indicate what type of information therapists need to know to best treat

inividuals with BPD. In question 10, we would like for you to indicate why the narrative said this type of treatment is important. The narrative listed 5 separate reasons why this type of treatment is important to the therapist's understanding of the patient. Please list as many of these reasons as possible, and be as specific as possible in your answer.

a. 2 point answers: (score all that are present)

1) idea of generational/cyclical repetition, such as significant life patterns repeat themselves over generations.

2) idea that individuals with BPD choose current relationships which are also chaotic and/or unsupportive

3) idea that current choices echo past relationships i.e., parent(s) whom the person is trying to deal with.

4) idea that current family may repeat same struggles as past family

i.e. family that the person starts as an adult may repeat the same struggles that existed in the family in which he or she grew up.

Appendix L

Multiple Choice Test Scoresheet

Instructions: Question numbers are followed by the letter corresponding to the correct answer.

1. a
2. c
3. d
4. b
5. c
6. d
7. d
8. a
9. c
10. d
11. a
12. c
13. d
14. d
15. b

Appendix M

Measure of Participant Satisfaction in Three Formats for Print, Audiotape, and Videotape Participants

Version Administered to Print Participants

Instructions: For each statement below, please circle the number that is above the answer that is most true for you.

1. How effective was the brochure in teaching you information about Borderline Personality Disorder?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

2. How much information did you learn from the brochure?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

3. How much information did you remember from the brochure?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

4. How much did you like learning infomration about BPD via the brochure?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

5. How easy was it for you to learn information about BPD via the brochure?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

6. Would you have preferred receiving information about the narrative via audiotape?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

7. Would you have preferred receiving information about the narrative via a videotape?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

Version Administered to Audiotape Participants

Instructions: For each statement below, please circle the number that is above the answer that is most true for you.

1. How effective was the audiotape in teaching you information about Borderline Personality Disorder?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

2. How much information did you learn from the audiotape?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

3. How much information did you remember from the audiotape?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

4. How much did you like learning infomration about BPD via the audiotape?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

5. How easy was it for you to learn information about BPD via the audiotape?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

6. Would you have preferred receiving information about the narrative via a brochure?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

7. Would you have preferred receiving information about the narrative via a videotape?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

Version Administered to Videotape Participants

Instructions: For each statement below, please circle the number that is above the answer that is most true for you.

1. How effective was the videotape in teaching you information about Borderline Personality Disorder?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

2. How much information did you learn from the videotape?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

3. How much information did you remember from the videotape?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

4. How much did you like learning infomration about BPD via the videotape?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

5. How easy was it for you to learn information about BPD via the videotape?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

6. Would you have preferred receiving information about

the narrative via audiotape?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

7. Would you have preferred receiving information about the narrative via a brochure?

1	2	3	4	5
Not at all	A little	Somewhat	Very	Extremely

Appendix N

Rating Scales for Experiment 2

Instructions: For the following questions, please circle the number corresponding to the descriptors listed below each question. Please use space the provided to indicate what specifically needs improvement (include item numbers when relevant).

Rating scales for Multiple Choice Test

1) To what extent are the questions on the multiple choice test clearly written?

1 2 3 4 5

Not at all Somewhat To a great extent

Comments:

_____

_____

_____

_____

2) To what extent are questions on the multiple choice test representative with respect to the independent variable?

1 2 3 4 5

Not at all Somewhat To a great extent

Comments:

_____

_____

_____

_____

3) To what extent does the multiple choice test cover the content area adequately?

1 2 3 4 5

Not at all Somewhat To a great extent

Comments:

_____

_____

_____

Rating Scales for Cued Recall Task

1) To what extent is each question clearly written?

1 2 3 4 5

Not at all Somewhat To a great extent

Comments:

_____

_____

_____

2) To what extent is each question representative with respect to the narrative?

1 2 3 4 5

Not at all Somewhat To a great extent

Comments:

3) To what extent do questions cover the content area adequately?

1 2 3 4 5

Not at all Somewhat To a great extent

Comments:

4) To what extent do questions vary in the amount of detail required for a correct answer?

1 2 3 4 5

Not at all Somewhat To a great extent

Comments:

_____

_____

_____

Rating Scale for Satisfaction Measure

1) To what extent is each question clearly written?

1 2 3 4 5

Not at all Somewhat To a great extent

March, 2022

The following content on pages 222-265 has been removed from this dissertation, per the request of the copyright holder:

Appendix O: Multidimensional Aptitude Battery

Appendix P: Instructions for prorating Multidimensional Aptitude Battery Subtest Scores

Appendix Q: Multidimensional Aptitude Battery Specific Testing Instructions

Appendix R

Self-report of Prior Knowledge

Instructions: Please answer the following questions below.

1. Have you ever been exposed to any information about Borderline Personality Disorder?

   Yes ____ No ____

2. If yes, please check where you obtained this information:

   ___ In a psychology course

   ___ Through an outside reading book (i.e. book not for a class)

   ___ Through an informational pamphlet

   ___ Through a program on the radio

   ___ Through a program on television

   ___ Through talking to someone else

   ___ Other (please describe) _____

3. Taking your answer to question #2 into consideration, how much information would you say you have been exposed to about Borderline Personality Disorder?

1	2	3	4	5
None at all	A little	Some	A moderate amount	A lot

4. Have you ever had any personal experience with

Borderline Personality Disorder, either through yourself or someone close to you having the disorder?

Yes _____ No _____

5. Taking your answer to question #4 into consideration, how much personal experience would you say you have had with Borderline Personality Disorder?

1	2	3	4	5
None at all	A little	Some	A moderate amount	A lot

6. Considering <u>both</u> the amount of information you have been exposed to and any personal experience with the disorder, please indicate how much you know about Borderline Personality Disorder.

1	2	3	4	5
None at all	A little	Some	A moderate amount	A lot

7. Have you ever been exposed to any information about Panic Disorder?

Yes _____ No _____

8. If yes, please check where you obtained this information:

___ In a psychology course

___ Through an outside reading book (i.e. book not for a class)

___ Through an informational pamphlet

___ Through a program on the radio

___ Through a program on television

___ Through talking to someone else

___ Other (please describe) _____

9. Taking your answer to question #8 into consideration, how much information would you say you have been exposed to about Panic Disorder?

1	2	3	4	5
None at all	A little	Some	A moderate amount	A lot

10. Have you ever had any personal experience with Panic Disorder, either through yourself or someone close to you having the disorder?

Yes ____ No ____

11. Taking your answer to question #10 into consideration, how much personal experience would you say you have had with Panic Disorder?

1	2	3	4	5
None at all	A little	Some	A moderate amount	A lot

12. Considering <u>both</u> the amount of information you have been exposed to and any personal experience with the

disorder, please indicate how much you know about Panic Disorder.

1	2	3	4	5
None at all	A little	Some	A moderate amount	A lot

13. Have you ever been exposed to any information about Manic Depression?

Yes ____ No ____

14. If yes, please check where you obtained this information:

___ In a psychology course

___ Through an outside reading book (i.e. book not for a class)

___ Through an informational pamphlet

___ Through a program on the radio

___ Through a program on television

___ Through talking to someone else

___ Other (please describe) _____

15. Taking your answer to question #14 into consideration, how much information would you say you have been exposed to about Manic Depression?

1	2	3	4	5
None at all	A little	Some	A moderate amount	A lot

16. Have you ever had any personal experience with Manic Depression, either through yourself or someone close to you having the disorder?

Yes _____ No _____

17. Taking your answer to question #16 into consideration, how much personal experience would you say you have had with Manic Depression?

1	2	3	4	5
None at all	A little	Some	A moderate amount	A lot

18. Considering <u>both</u> the amount of information you have been exposed to and any personal experience with the disorder, please indicate how much you know about Manic Depression.

1	2	3	4	5
None at all	A little	Some	A moderate amount	A lot

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