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DSM IV: Diagnosis Helper

Executive Summary

Currently clinicians face several issues when diagnosing a client. For example, clinicians are often expected to diagnose a client after only a single one-hour meeting. Clinicians are also expected to appropriately choose a diagnosis from the DSM IV manual which contains several hundred diagnoses.[1] The problem is also exacerbated by the fact that many MSW programs do not require students to take a DSM IV course to properly learn all of the diagnoses in the book. As a result, clinicians tend to use only a limited number of diagnoses for a broad range of symptoms.

For our project, we built a tool to walk through the steps of the DSM IV decision tree models for diagnosing a client. On the initial form, the user is asked to choose from the higher-level differential diagnoses. The user is then asked a series of questions related to the selected differential diagnoses and specific diagnoses are shown based on the user response. The idea is to give the clinician or student using the program a pool of diagnoses that could potentially include some or all of the symptoms described. The user is then able to gain more information by selecting one or more specific diagnosis and clicking on the more information button.

After the user is taken to the final form, he/she can click on a diagnosis where the information is scraped from the psychiatryonline.com website or the user can choose a diagnosis and click on the button "Search Online" where the user is taken to an internet explorer browser where the term selected has already been searched using the psychiatryonline.com search engine.

The purpose is to force the user to consider all possible diagnoses and then give the user a chance to research more if he/she has questions about a diagnosis that he/she is unfamiliar with or might not understand completely. In doing so, we hope to help students and clinicians be better educated when it comes to the DSM IV and make a carefully thought out diagnosis for each client.

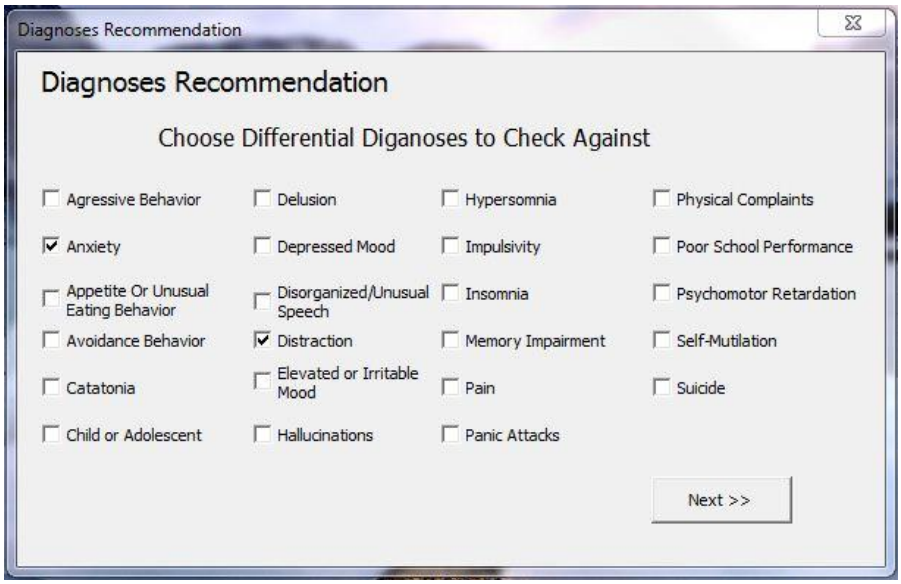
Note: This project will only work if you are on BYU campus or if you are logged in to psychiatryonline.com. Although psychiatryonline.com is not a free website, BYU is given a free subscription for any person accessing the site from on campus. Our project was intended as a learning tool for BYU MSW students and therefore considers that all users will be on campus.

[1] The DSM IV is a manual of diagnoses and definitions published by the American Psychiatry Association

Implementation Documentation

The first task for completing our project was to understand the mental model for a clinician when determining a diagnosis for a client. After interviewing MSW students and professors, including Dr. Gordon Limb (BYU MSW Program Director) and Dr. Wanda Spaid (BYU MSW DSM IV Instructor), we were led to understand that a clinician's first step in diagnosing a client is to determine which differential diagnoses the client's symptoms fall under. A differential diagnosis is a high-level diagnosis which contains several specific diagnoses that are chosen based on severity, duration, etc. For example, if a person is having a hard time sleeping, the clinician might choose a specific diagnosis under the differential diagnosis of insomnia.

According to the persons we interviewed, a client may fall under multiple differential diagnoses, but the different diagnoses do not require any type of process because they are higher level and only encompass the diagnosis that will ultimately be given to a client. Therefore we decided to list the 23 differential diagnoses on the initial form of the project as a list of checkboxes.



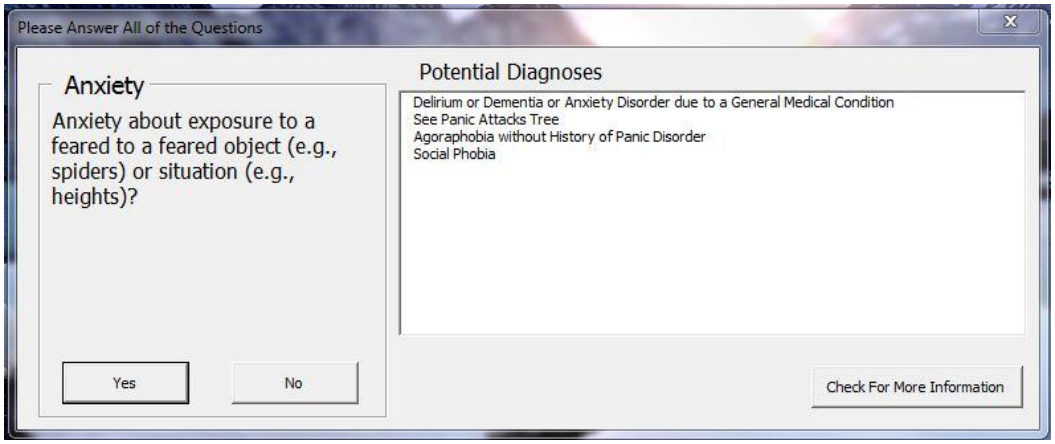
Each differential diagnosis has a decision tree model which contains yes and no questions for the clinician to follow. Depending on the answer, the clinician is lead to a potential diagnosis. Because no previous person has publicly published this type of project, the decision tree models were only available in PNG image format so we had to manually enter in each step of the decision tree model into our spreadsheets. See appendix A for an example of a typical differential diagnosis decision tree model in PNG format.

Our next step was to determine a process for stepping through each question using the decision tree model that would allow us to walk the user through the model and give potential diagnoses that were applicable based on the user input. In order to do so, we input three columns of information: the question, the consequence of a no answer, and the consequence of a yes answer. Each consequence also lead to a subsequent question or was marked as the end of the decision tree model. Despite the fact that generally the decision tree models are supposed to end once the user has reached a potential

diagnosis, we decided to walk the user through all of the questions to be sure that another diagnosis was not overlooked.

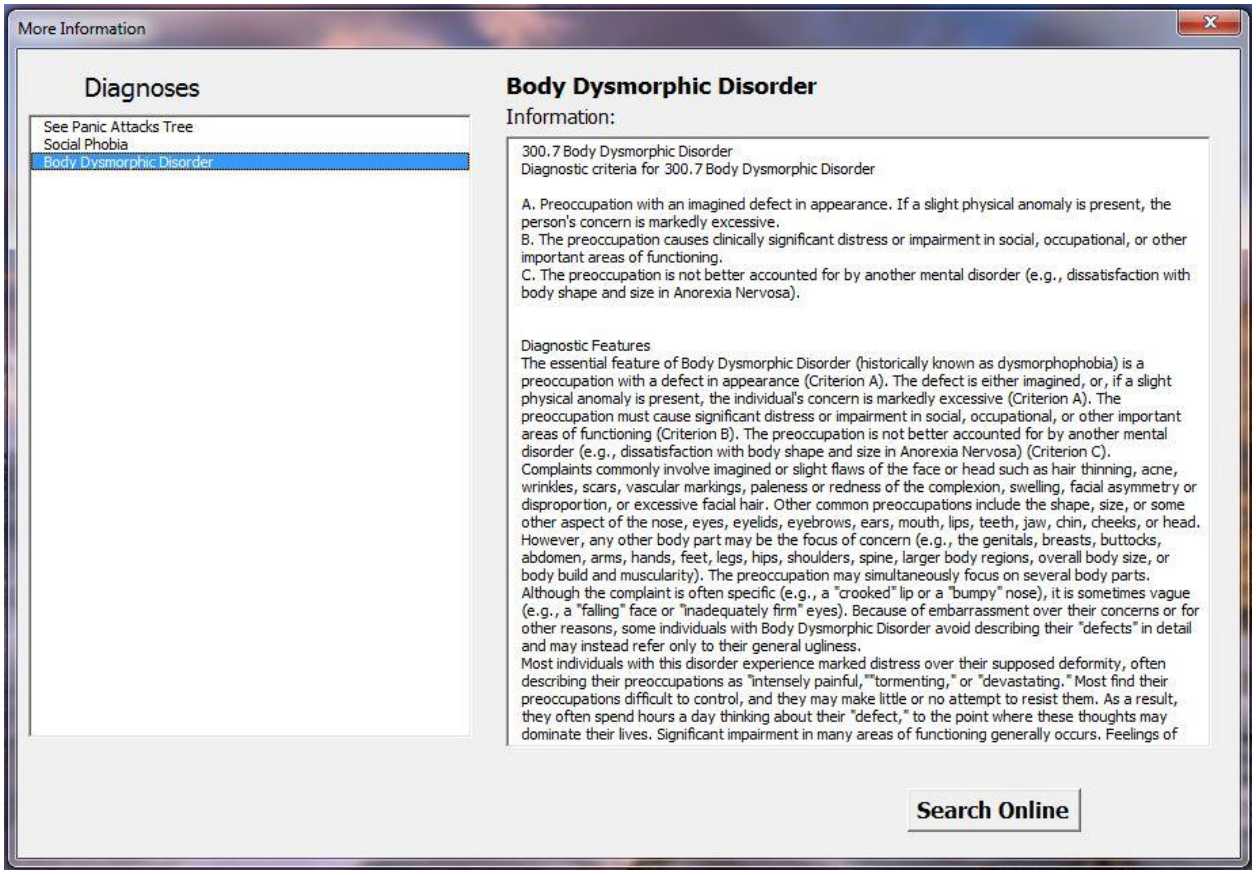
	A	B	C
1	Question	No	Yes
2	Due to the direct effects of a general medical condition?	A4	A3
3	Occurs exclusively during Delirium?	D:Sleep Disorder Related to a General Medical Condition Insomnia Type, A4	D:Delirium Due to a General Medical Condition, A4
4	Due to the direct effects of a substance (including medication)?	A6	A5
5	In excess of that usually encountered with intoxication or withdrawal?	D:Substance Intoxication, Substance Withdrawal, A6	D:Substance-Induced Sleep Disorder Insomnia Type, A6
6	Related to another mental disorder (e.g. Schizophrenia, Mood Disorder, Generalized Anxiety Disorder, PTSD)?	A8	A7
7	Warrants independent clinical attention?	D:Mental Disorder only (no separate diagnosis of Insomnia necessary), A8	D:Insomnia Related to Another Disorder, A8
8	Related to breathing problems during sleep?	A9	D:Breathing-Related Sleep Disorder, A9
9	Related to nightmares, sleep terrors, or sleepwalking?	A10	D:Parasomnia (no separate diagnosis of Insomnia necessary), A10
10	Related to mismatch between individual's schedule and natural sleep-wake cycle?	A11	D:Circadian Rhythm Sleep Disorder, A11
11	Duration at least 1 month?	A12	D:Primary Insomnia, A12
12	Causes clinically significant distress or impairment?	:END	A13
13	Occurring in response to a stressor?	D:Dyssomnia NOS, :END	D:Adjustment Disorder, :END
14			
15			

These questions were shown on the left side of the next form with yes and no buttons. As the user enters in his answers, he/she is given more questions and diagnoses may appear as appropriate depending on the user's response. Above the question is the name of the differential diagnosis that the user is currently answering the question regarding.

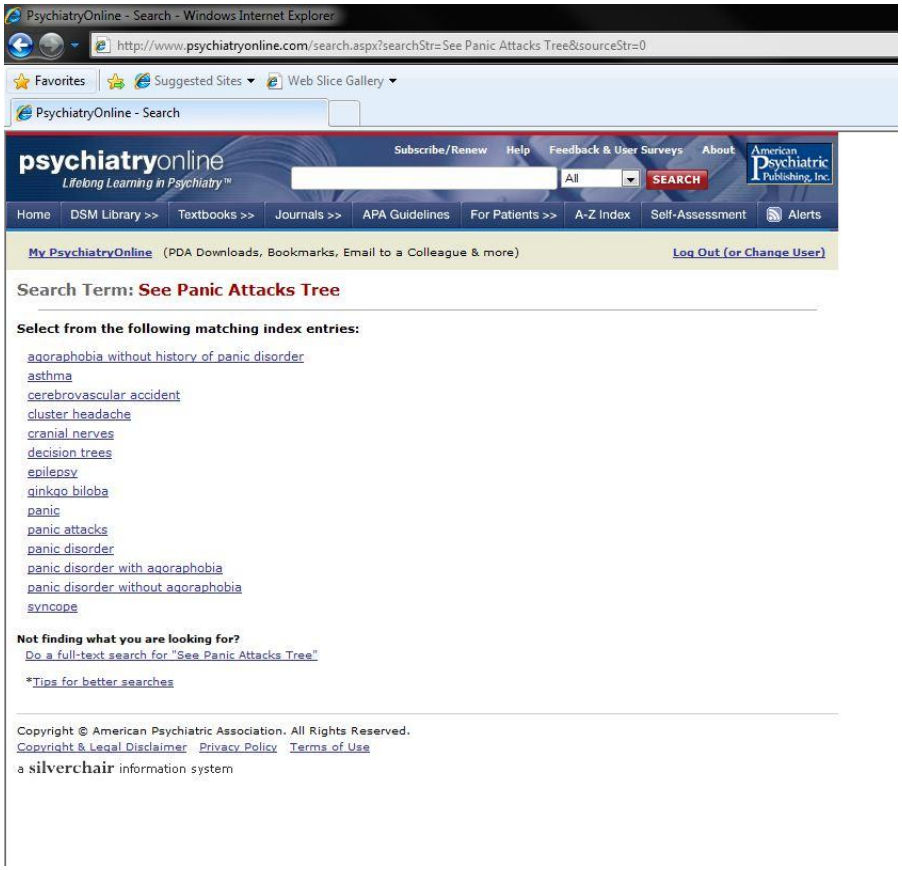


In order to continue to the next form, the user is asked to choose at least one diagnosis from the list. If the user does not choose a diagnosis, then a popup appears asking the user to choose at least one. The user is then taken to the third form. On the third form, a list of the chosen diagnoses appears. This list is generated as an array from the diagnoses selected on the previous screen.

Once the user chooses an item from the list on the left, the program will generate the information regarding that list item and enter the information into the text box on the right hand side of the form. This information is pulled using a web query wizard macro that was recorded for this purpose. Web information is pulled to a sheet and we then search the sheet for information that will be inserted into the text box.



If there is no information to be found for a given list item, or if the user would like to know more about a chosen list item, we implemented a “Search Online” button that will search the psychiatryonline.com using the words/phrase chosen. We implemented this using the agent class module that was given to us by Dr. Gove Allen. Using the agent we were able to create an instance of Internet Explorer, navigate to psychiatryonline.com, find the search box, enter in the text to search, and submit that form using the javascript function that handles the searches on that site.



Learning and Conceptual Difficulties

As far as learning, we felt that this project was a collaboration of almost all of the concepts discussed in class. (Unfortunately we couldn’t find a practical use for barcode scanning for this particular project.) We used elements from each of the projects and also used the agent class module that was introduced after all of the projects had been turned in.

We used forms, like the User Form project, where we received and processed user input to programmatically return results to the form. We learned somewhat how to format the data that we received from the web in order to make it presentable in the text box when a user requested more information.

We also used the web query wizard in order to scrape data from the website. This principle was first introduced to us in the first project, Fallen Angel. Our web query wasn’t super difficult, but it required us

to manipulate the query strings with certain data and also to account for entries where a web query was not available. We were able to do this by wrapping the query in an if-statement and check for data before running the query to avoid errors.

We used arrays to contain the differential diagnoses from the initial form as well as the selections from the list boxes. We also learned how to handle multi-select list boxes and store the data selected in an array. Arrays were introduced in the Boggle project.

The web agent allowed us to search the site and present it to the user. We were a little perplexed when the submit box didn't have a name, but we were able to overcome it by using the javascript function from the agent class.

As for difficulties, our biggest conceptual difficulty was figuring out how to organize the data from the decision trees into excel so we could easily traverse the decision tree. It took us a while to decide how to do it and work through the bugs that arose from it. Then we were stuck doing data entry for quite a while to convert the images into our format. We also had difficulty trying to associate each diagnosis with an individual entry on PsychiatryOnline.com's website as some did not have an entry and there were a number of different formats which made it difficult to parse the data for our form. Implementing the 'Online Search' button helped solve that problem so we could direct them to the most relevant pages on the website.

Appendix A – Differential Diagnosis Decision Tree