



**MENTAL MODELS RESEARCH TO INFORM THE DESIGN OF MSU'S
RECYCLING PROGRAM**

by

Lauren K. Olson and Joe Arvai

Behavior Team

Environmental Stewardship Systems Team

Briefing Paper No. 08-2

Behavior Team – Research Brief

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Re: Mental models research to help inform the design of MSU's recycling program

Date: 19 February 2008

Method

The mental model methodology outlined by Morgan, Fischhoff et al. (2002), helps communicators to better understand their audience by way of a systematic analysis of the information they currently possess and their information needs. Based on this knowledge, communicators can design and implement more effective outreach plans.

The process of mental model interviews begins with an expert mental model (Fig. 1), which depicts the current state of knowledge surrounding a particular issue—recycling in this case. This expert model is developed based on an extensive review of the literature and a series of open-ended interviews with recognized experts familiar with the issue. Then, the open-ended interview to be administered to the target subjects is derived from the expert model. The protocol is purposefully open-ended to allow subjects to express both correct and incorrect knowledge and/or beliefs. Each interview starts with a broad question and followed by subsequent questions that seek to exhaust a subject's knowledge. Subjects' responses are then analyzed to develop a mental model for each participant, indicating where their knowledge overlaps the expert knowledge.

Subjects

Both students and faculty took part in this study. Student subjects were recruited via mail, and consisted of 20 males and 20 females from four different student residential halls (N=40). Additionally, the students were recruited to be diverse in terms of their college and major area of study. The faculty sample (N=18) was recruited from a randomized phone list. With the assistance of administrators at MSU Recycling, we identified buildings on campus that were thought to be "recycling-friendly" (e.g., buildings where there was adequate space and infrastructure to carry out recycling activities) as well as buildings where recycling is typically more difficult. Nine faculty members from each type of building were interviewed. Faculty and student interviews lasted between 30 minutes to 80 minutes.

Results and Recommendations

All of the results were compiled to create a comprehensive student mental model (Fig. 2) and comprehensive faculty mental model (Fig. 3). For this research brief, some results and recommendations will be discussed; however full recommendations are forthcoming as part of Lauren Olson's thesis work.

Where to recycle: According to a chi-square analysis—and as expected—faculty know significantly more than students when it comes to recycling in academic building, while students know significantly more than faculty about recycling in residential hall ($p < .05$)¹. Student and faculty knowledge was generally poor in terms of dining or concession areas where recycling could take place; these areas included recycling at sports-venues, at residential dining cafeterias, at the International Center Food Court, and at Sparty's Cafés across campus. **Recycling in dining halls and concession areas, therefore, could be a good starting point for enhancing knowledge about recycling opportunities outside of the dorm room and classroom.**

¹ Unless otherwise mentioned, all statistically significant attributes had a p-value of less than .05 (95% confidence level) according to a chi-square analysis.

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What to recycle: There were distinct differences between the knowledge of students and faculty about paper/fibers that can be recycled on campus. Both populations were not knowledgeable about the full range of paper products on campus that can be recycled; this result was also confirmed in the web survey conducted by Kaplowitz et al. Students were significantly more knowledgeable than faculty about recycling used white paper, newspapers², as well as cardboard. Faculty, by contrast, had a significantly higher level of knowledge than students about recycling magazines and mixed paper. The gap surrounding the recycling of softbound books warrants filling for both faculty (27.5% knew that softbound books can be recycled) and students (25.0% knew that softbound books can be recycled). **Faculty members need additional information regarding the recycling of cardboard and mail, while students need information regarding the recycling of mixed paper, magazines, and paperboard³. Both groups need to improve their knowledge about the recycling of softbound books.**

Why to recycle: Besides gaps in knowledge about where and what to recycle, the question of *why* to recycle resulted in some surprises. All faculty and students interviewed understood the general connection between recycling and environmental benefits. However, relatively few understood the specific nature of these benefits (e.g., benefits in terms of energy efficiency, cleaner air, and cleaner water). **MSU is in a unique position to teach students—and to a lesser extent, faculty and staff—about the importance of recycling in relation to the environment.**

Long-term Recommendations

- Though this study identified several gaps in knowledge, judgments will have to be made regarding *which* specific gaps to address during communications and outreach efforts.
- A coupled strategy to facilitate recycling will require more knowledgeable students, faculty, and staff, as well as a thoughtfully designed, well structured, and institutionalized program. Recycling knowledge is easier to employ when there are consistent spaces in academic buildings, residential halls, and food venues for recycling collection.
- Our data shows that students and faculty have differing knowledge; it can be inferred that staff also have differing knowledge based on their unique role in the university and based on preliminary results from the web survey. The communications effort should not assume that a blanket strategy would be practical for all populations.
- Generally speaking, sustainability experts should not fall into the trap of believing that they know exactly what people need to know to make smart choices about recycling. Without an informed understanding of the knowledge, values, and beliefs held by the communities we are trying to reach, we risk wasting time and resources scattering uncoordinated messages with the hope of influencing behavior.

² It is worth noting, however, that both groups had a very high level knowledge regarding recycling newspaper and white paper.

³ Both groups had a low understanding of paperboard, but students are considered a larger producer of the material due to their personal food purchases. Should students be allowed to recycle this material more readily in the future, they need information regarding the material characteristics and collection points.

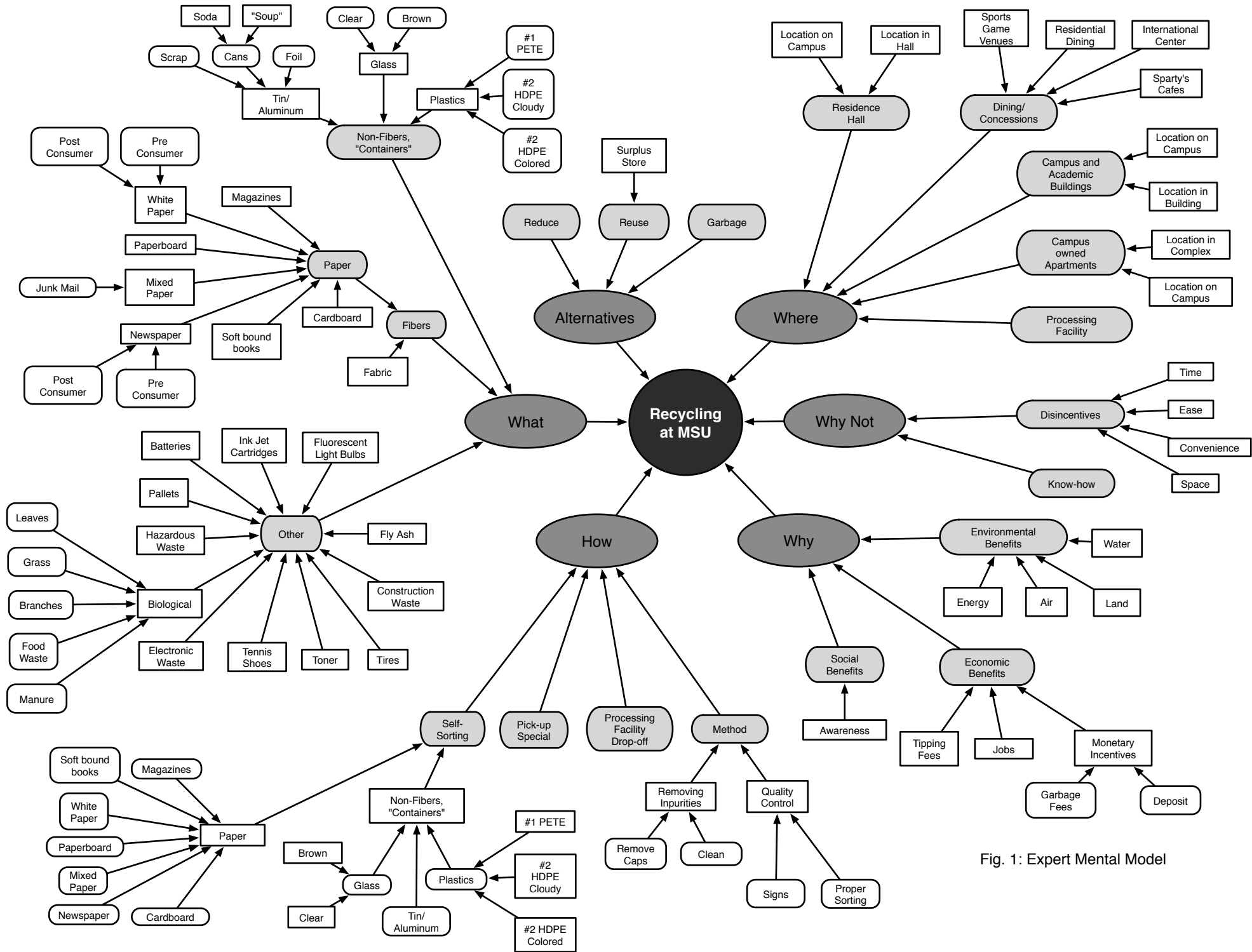


Fig. 1: Expert Mental Model

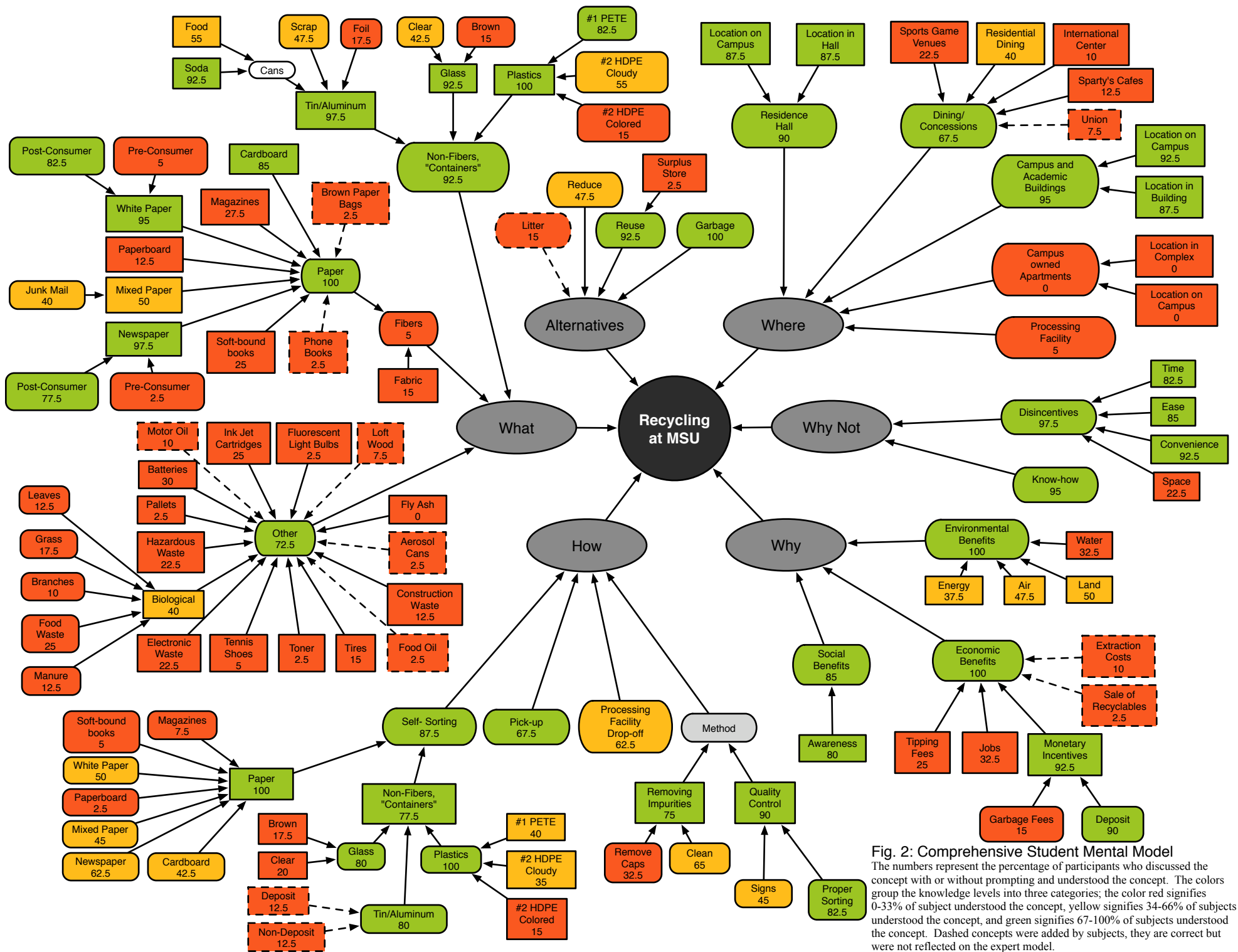


Fig. 2: Comprehensive Student Mental Model
 The numbers represent the percentage of participants who discussed the concept with or without prompting and understood the concept. The colors group the knowledge levels into three categories; the color red signifies 0-33% of subject understood the concept, yellow signifies 34-66% of subjects understood the concept, and green signifies 67-100% of subjects understood the concept. Dashed concepts were added by subjects, they are correct but were not reflected on the expert model.

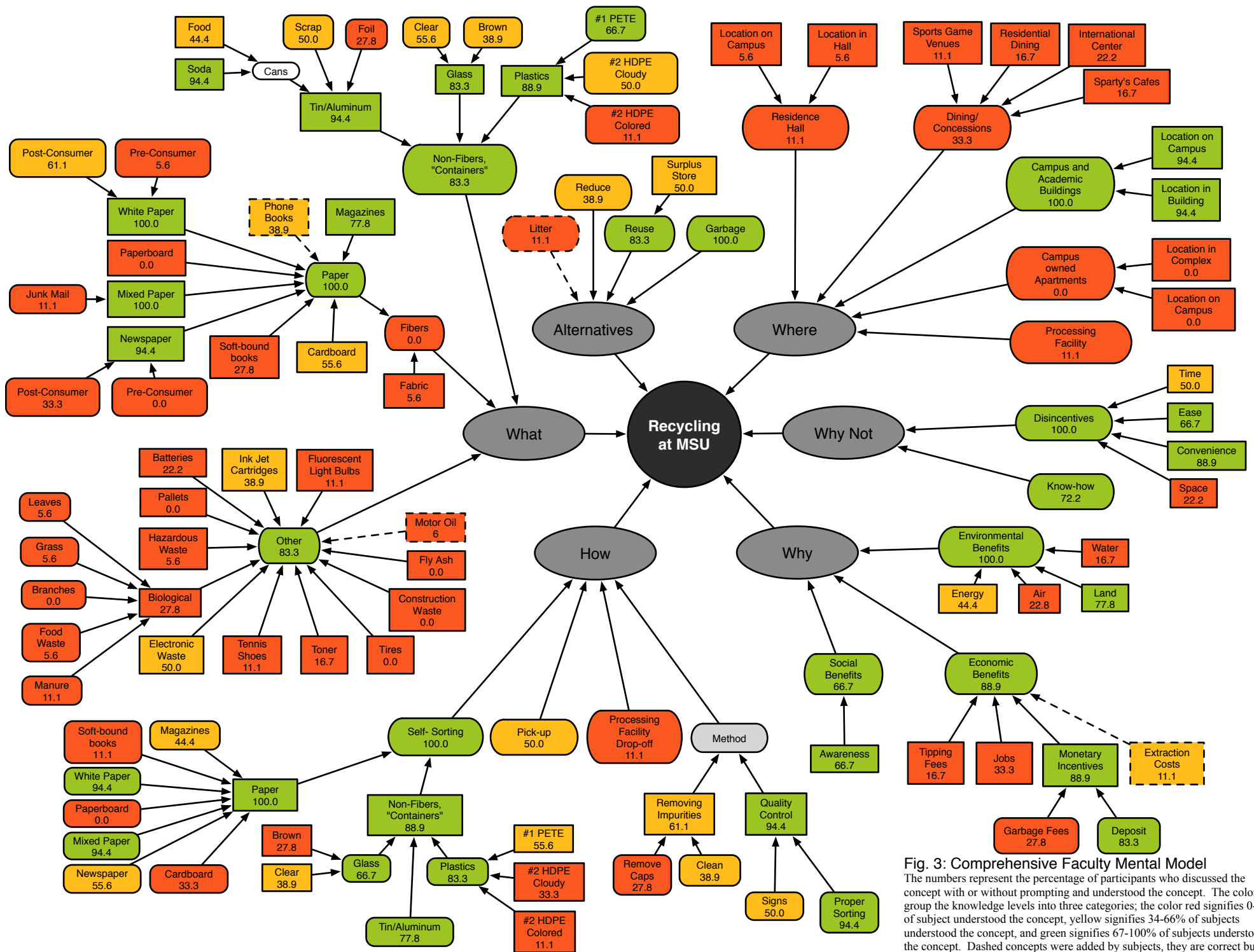


Fig. 3: Comprehensive Faculty Mental Model
 The numbers represent the percentage of participants who discussed the concept with or without prompting and understood the concept. The colors group the knowledge levels into three categories; the color red signifies 0-33% of subject understood the concept, yellow signifies 34-66% of subjects understood the concept, and green signifies 67-100% of subjects understood the concept. Dashed concepts were added by subjects, they are correct but were not reflected on the expert model.