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Satisfaction et réussite académique au cégep.

College Satisfaction and Academic Success.

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**Final Report Presented to PAREA**  
**Rapport final présenté à PAREA**

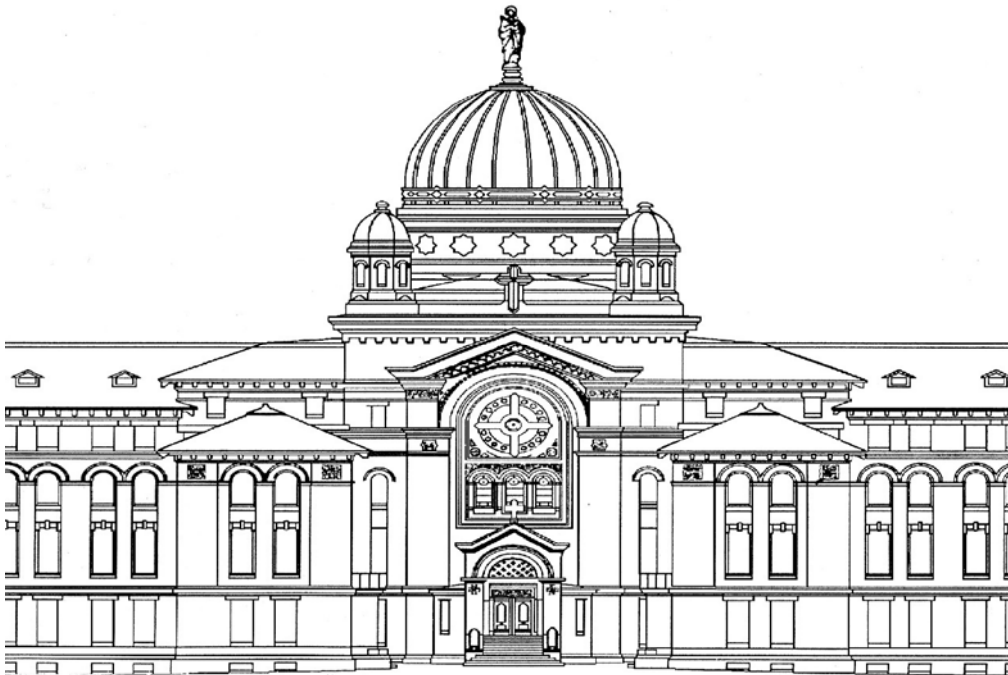
Spring / Printemps 2011

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Dépôt légal-Bibliothèque nationale du Québec, 2011

Dépôt légal-Bibliothèque nationale du Canada, 2011

ISBN : 978-1-5501602-3-9

**Satisfaction et réussite académique au cégep.**

*Liens entre la satisfaction, le sexe et la présence ou non d'incapacité*

**Satisfaction and College Success**

*A Comparison by Sex and Disability*

Shirley Jorgensen<sup>1</sup>, Catherine Fichten<sup>2</sup>, Alice Havel<sup>3</sup>.

Shirley Jorgensen, M.B.A. <sup>1</sup>

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## Satisfaction et réussite académique au cégep.

### *Liens entre la satisfaction, le sexe et la présence ou non d'incapacité*

#### Résumé

##### Objectifs

Nous avons évalué la satisfaction des élèves<sup>1</sup> relativement à plusieurs aspects de la vie collégiale, et sa corrélation avec les résultats scolaires et le maintien aux études. Nous avons comparé les scores des étudiants et étudiantes ainsi que ceux des élèves ayant ou non une incapacité. Nous avons également exploré la relation entre les obstacles et les facilitateurs sur le plan personnel et collégial d'une part et, de l'autre, la satisfaction et la réussite scolaire. Notre recherche avait pour objectifs : (1) de déterminer si étudiants et étudiantes, ayant ou non une incapacité, diffèrent dans leur perception des aspects importants de la vie collégiale et dans leur taux de satisfaction relativement à ces aspects, (2) d'examiner si la satisfaction relative aux divers aspects de la vie collégiale est liée à la perception de facilité ou de difficulté des études, (3) de déterminer si la satisfaction et la perception de difficulté peuvent constituer ou non des prédicteurs fiables de réussite et de maintien aux études pour les élèves, et (4) selon les résultats, de recommander des interventions pour réduire la déperdition des effectifs et améliorer les résultats médiocres des étudiants et étudiantes, qu'ils aient ou non une incapacité.

##### Méthode

Ont participé à cette étude 6065 élèves inscrits à des programmes de deux ou trois ans en vue d'obtenir un diplôme collégial. Parmi eux, 394 avaient une incapacité (étudiantes : N = 220; étudiants : N = 174) et 5671 n'en avaient pas (étudiantes : N = 3479; étudiants : N = 2192). Des 394 élèves ayant une incapacité, 192 (49 %) s'étaient inscrits aux services adaptés du collège.

Nous avons fait appel à deux outils de sondage pour étudier la rétroaction des élèves : l'inventaire du taux de satisfaction des élèves, ou SSI (*Student Satisfaction Inventory*,

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<sup>1</sup> Pour faciliter la lecture de ce texte, le terme « élèves » est utilisé pour les étudiants en général, et les termes « étudiants » et « étudiantes » pour les étudiants de sexe masculin et féminin.

Shreiner et Juillerat, 1994), de la firme Noel-Levitz et le Questionnaire sur votre expérience au cegep, ou QEP (Fichten, Jorgensen, Havel et Barile, 2006).

Avec le SSI, les élèves évaluent à quel point ils sont satisfaits de la façon dont leurs institutions répondent ou non à leurs attentes sur divers aspects. Une échelle de satisfaction de sept points est utilisée : (*Très insatisfait (1); Insatisfait (2); Assez insatisfait (3); Neutre (4); Assez satisfait (5); Satisfait (6); Très satisfait (7)*). Ils attribuent également une note d'importance à ces mêmes aspects selon une échelle d'importance de sept points allant de *Pas du tout important (1) à Très important (7)*. Les éléments de satisfaction peuvent être analysés un par un. Le système de mesure fournit aussi douze scores liés à une échelle ainsi qu'un score de satisfaction générale. Un score « d'écart de performance » est calculé en soustrayant les scores de satisfaction des scores d'importance pour obtenir une mesure de l'écart plus ou moins grand entre les attentes des élèves et la réponse à ces attentes par l'institution. Un écart plus important indique qu'une institution ne répond pas aux attentes des élèves, un écart moindre indique que l'institution se rapproche de leurs attentes, et un écart négatif suggère que l'institution les dépasse. L'ajout de deux questions-résumés nous ont aidés à compléter nos analyses : *Évaluez votre satisfaction générale relativement à votre expérience à ce jour dans cet établissement (échelle de satisfaction de 7 points) et Tout compte fait, si c'était à refaire, vous inscririez-vous dans cet établissement? (échelle de 7 points : absolument à absolument pas)*.

Les données SSI tirées des ensembles de données des collèges communautaires et des ensembles de données nationales canadiennes ont été fournies par Noel-Levitz Inc. Les données sur le statut d'incapacité des participants n'étaient pas disponibles. Nous n'avons donc pu utiliser de données relatives aux incapacités des élèves qu'à l'examen des résultats pour notre collège.

Deux des échelles (Situation personnelle et Environnement du Cégep) du QEP ont été utilisées pour la présente étude, ainsi qu'un score global pour toutes les échelles. Les scores les plus élevés indiquent que les aspects évalués ont facilité la vie scolaire des élèves, et les scores les plus bas indiquent que les aspects évalués l'ont rendue plus ardue.

## Résultats et conclusions

Voici en résumé les résultats reliés aux questions soulevées par nos hypothèses.

### 1. *Les étudiants et les étudiantes diffèrent-ils dans leur perception des aspects importants de l'expérience collégiale?*

Notre hypothèse que les étudiants et les étudiantes différencieraient dans les aspects de leur expérience collégiale jugés importants n'a pas été confirmée. Car même si nous avons constaté une tendance générale des étudiants à attribuer des scores plus bas que ceux des étudiantes à l'importance des différents aspects, la corrélation était forte entre les scores masculins et féminins attribués aux échelles d'importance, et ce pour tous les élèves, qu'ils aient ou non une incapacité. Tous les groupes ont placé première en importance l'*Efficacité de l'enseignement*. Toutefois, une différence évidente entre les sexes tient à la place relativement importante attribuée à la *Sécurité* par les étudiantes dans l'échantillon des collèges communautaires. De plus, les étudiants ayant une incapacité ont attribué plus d'importance aux *Services adaptés offerts sur le campus* que les étudiantes ayant une incapacité, et moins d'importance à l'aspect *Admission et Aide financière*.

### 2. *Les élèves ayant ou non une incapacité diffèrent-ils dans leur perception des aspects importants de l'expérience collégiale?*

Notre hypothèse que les élèves ayant ou non une incapacité ne différencieraient pas dans leur perception des aspects importants de leur expérience collégiale a été confirmée. Pour les élèves ayant une incapacité de notre échantillon, l'importance relative des aspects évalués, affichait une forte corrélation avec les choix des élèves sans incapacité. Et ce pour les deux sexes.

### 3. *Les étudiantes (ayant ou non une incapacité) sont elles plus satisfaites de leur expérience collégiale que les étudiants?*

Nous avons constaté que le taux de satisfaction des étudiants des collèges nord-américains est généralement inférieur à celui des étudiantes. Cette différence a persisté même après la covariation des résultats scolaires avec la satisfaction pour notre échantillon d'étude. Les étudiants et étudiantes étaient cependant plus ou moins satisfaits des mêmes aspects et les scores de satisfaction selon le SSI démontraient une forte corrélation entre les choix de tous

les groupes examinés. Cependant, le fait que (1) la satisfaction générale des étudiants soit moins élevée que celle des étudiantes pour toutes les échelles et tous les échantillons testés, que (2) les creux et crêtes de satisfaction soient similaires pour les douze échelles, et que (3) les scores moyens pour les aspects et les échelles soient en étroite corrélation suggère que la différence de satisfaction entre les sexes reflète sans doute une tendance générale des étudiants à attribuer des scores plus bas que les étudiantes, plutôt que de réelles différences entre les sexes sur les éléments de satisfaction ou d'insatisfaction. Notons toutefois qu'en ce qui concerne la satisfaction de l'état récent de l'équipement de laboratoire, la différence est plus marquée que la moyenne et représente peut-être un aspect plus préoccupant pour les étudiants que pour les étudiantes, qu'ils aient ou non une incapacité.

Des différences de satisfaction plus sensibles que la moyenne ont également été constatées entre les étudiants et étudiantes ayant une incapacité, sur des aspects tels que l'information sur ce qui se passe sur le campus, l'engagement de l'institution envers les élèves à temps partiel, la flexibilité des politiques de changement de cours (abandon/ajout), la façon dont les services d'orientation aident les nouveaux élèves à s'adapter au collège, et la façon dont le personnel des services de recrutement et d'admission réagit aux requêtes et besoins spéciaux des élèves. Le taux de satisfaction des étudiantes était plus élevé que celui des étudiants.

#### *4. Les élèves ayant une incapacité expriment-ils le même taux de satisfaction de leur expérience collégiale que les élèves sans incapacité?*

Notre hypothèse supputait que les élèves ayant une incapacité exprimeraient le même taux de satisfaction de leur expérience collégiale que les élèves sans incapacité. Les résultats l'ont démentie. En général, les étudiants et étudiantes ayant une incapacité ont exprimé des taux de satisfaction inférieurs à ceux de leurs pairs sans incapacité, sur l'échelle variable de satisfaction globale et sur cinq des douze sous-échelles. Cette différence était cependant liée à leur inscription ou non aux services adaptés offerts sur le campus.

5. *Les élèves ayant une incapacité inscrits aux services adaptés offerts par le collège sont-ils plus satisfaits que leurs pairs qui n'y sont pas inscrits ou que les élèves sans incapacité?*

L'inscription aux services adaptés semble être différemment associée à la satisfaction selon le sexe de l'élève et la nature de l'incapacité. Généralement, les scores de satisfaction des étudiantes inscrites et ayant un trouble d'apprentissage ou un trouble de déficit de l'attention (TDA) en plus d'une autre incapacité étaient similaires à ceux des étudiantes sans incapacité. Les scores de satisfaction des étudiantes inscrites aux services adaptés étaient d'ailleurs plus élevés que ceux de leurs consœurs non inscrites. Il semble donc que pour les étudiantes ayant une incapacité, s'inscrire aux services adaptés leur permet d'être sur un pied d'égalité avec les étudiantes sans incapacité.

Toutefois, les résultats des étudiants ayant un trouble d'apprentissage ou de TDA semblent suggérer une satisfaction moindre que celle de leurs confrères sans incapacité, qu'ils soient ou non inscrits à des services adaptés. D'autre part, les étudiants ayant des incapacités autres que les troubles d'apprentissage ou de TDA ont affiché des taux de satisfaction non seulement équivalents à ceux de leurs confrères sans incapacité mais, sur certains points, supérieurs. Les étudiants ayant une incapacité autre que les troubles d'apprentissage ou de TDA et inscrits aux services adaptés se sont montrés plus satisfaits de plusieurs aspects de leur vie collégiale que leurs pairs non inscrits et que leurs confrères sans incapacité.

6. *Un faible taux de satisfaction de l'expérience collégiale est-il relié à un faible taux de maintien aux études pour tous les sous-groupes de cette étude?*

Les élèves plus satisfaits ont eu tendance à afficher un taux de maintien aux études plus élevé. Entre les élèves aux niveaux de satisfaction générale les plus bas et les plus élevés, la différence du taux de maintien aux études s'est située en moyenne aux environs de 10 %. Ceci vaut aussi bien pour les étudiants que pour les étudiantes, qu'ils aient une incapacité ou non. À l'exception des élèves ayant une incapacité, cette différence du taux de maintien aux études a disparu quand les résultats scolaires ont été utilisés comme covariables. Il est donc difficile de savoir si ce sont les notes plus élevées ou la plus grande satisfaction que l'on peut associer au meilleur taux de maintien aux études.



Pour les étudiants ayant une incapacité, cependant, la satisfaction et les résultats scolaires ont contribué séparément, même si, selon la régression logistique, les résultats scolaires ont dominé. Encore là, les changements étaient modestes, et la satisfaction générale n'a guère ajouté à la possibilité de différencier entre les deux groupes une fois que les résultats scolaires aient été pris en considération. La corrélation n'était pas linéaire. La tendance de satisfaction à la hausse s'aplanissait généralement quand le score dépassait le chiffre cinq. Donc, une fois un certain taux de satisfaction atteint, le taux de maintien aux études ne s'améliorait plus. La satisfaction s'est donc avérée être un meilleur, bien que plutôt faible, prédicteur du maintien aux études pour les élèves ayant une incapacité que pour les élèves n'en ayant pas.

La question *Tout compte fait, si c'était à refaire, vous inscririez-vous dans cet établissement?* nous a servi de mesure indirecte de satisfaction, puisque les élèves insatisfaits risquaient peu de répondre positivement à cette question. Même si les variables des douze échelles de satisfaction SSI et plusieurs autres aspects affichaient des corrélations relativement élevées avec les réponses à cette question, la plus forte corrélation a été constatée avec l'échelle de satisfaction globale SSI. De plus, la variabilité des réponses à la question sur la décision de se réinscrire, pour tous les groupes, était surtout reliée à l'aspect suivant : *L'expérience d'étudier sur ce campus est agréable*. Un accueil mettant les élèves à l'aise, un personnel et des enseignants attentionnés et coopératifs, la création d'un sens d'appartenance et d'un environnement favorisant la croissance intellectuelle des élèves, tous ces éléments ont contribué à une expérience collégiale positive pour les élèves.

7. *Un faible taux de satisfaction relativement à l'Efficacité de l'enseignement est-il le plus sérieux prédicteur du rendement scolaire?*

Les données n'appuient pas l'hypothèse que le taux de satisfaction de l'*Efficacité de l'enseignement* soit le plus important prédicteur des notes. La satisfaction globale était plus étroitement liée aux résultats scolaires que le taux de satisfaction relativement à l'*Efficacité de l'enseignement*. Aucune des variables de satisfaction testées n'a sérieusement permis de distinguer les élèves dont les notes seraient élevées ou basses. Quand les variables

d'échelle ont été testées, l'*Efficacité de l'enseignement* n'a pas figuré au modèle masculin, mais a figuré à celui des étudiantes. Les variables d'échelles jumelées étaient les plus à même de distinguer les élèves ayant des notes élevées de ceux ayant ou basses. Mais même dans ce cas, l'association était faible.

8. *Les élèves dont « l'écart de performance » est le plus significatif entre les aspects de la vie collégiale qu'ils considèrent importants et leur satisfaction relativement à ces aspects ont-ils le taux d'attrition le plus élevé?*

Pour les échelles SSI où l'importance de l'écart de performance (un écart plus grand signifiant que les attentes de l'élève ne sont pas satisfaites) était en corrélation avec le taux de maintien aux études, cette corrélation était faible. Les échelles qui ont montré des différences entre les petits et grands écarts de performance dépendaient du sexe et de l'incapacité. Chez les élèves sans incapacité, l'*Efficacité de l'enseignement* avait la plus forte corrélation pour les étudiantes et l'aspect *Admission et Aide financière* pour les étudiants. La seule échelle montrant une corrélation significative pour les élèves ayant une incapacité était l'échelle de *Sécurité*, et ce pour les étudiantes seulement.

La différence de taux de maintien aux études entre les petits et grands écarts pour l'échelle *Admission et Aide financière* était de 8 % pour les étudiants sans incapacité. Cette différence atteignait 20 % pour les étudiantes ayant une incapacité. La différence pour les étudiants ayant une incapacité, même importante (15 %), ne peut être considérée comme étant significative, étant donné la petite taille de l'échantillon. La différence de 2,1 % pour les étudiantes sans incapacité n'était pas significative, même si cette différence allait dans la même direction que celle des autres groupes.

Quant à l'échelle de l'*Efficacité de l'enseignement*, l'écart, qui n'était fortement relié au maintien aux études que pour les étudiantes sans incapacité, montrait une différence de maintien aux études de 5,9 %. Cette différence a perdu son importance lors de la covariation avec les résultats scolaires. Toutefois, la variable d'écart pour l'échelle *Admission et Aide financière* est demeurée significative pour les étudiants et les étudiantes ayant une incapacité, même ajusté selon les résultats scolaires.

9. *Les élèves dont le score de satisfaction générale est plus élevé selon le SSI trouvent-ils leurs études collégiales plus faciles (autrement dit, attribuent-ils des scores plus élevés au Questionnaire sur votre expérience au cégep ou QEP)?*

Notre hypothèse d'une corrélation entre les scores du QEP et la satisfaction générale selon le SSI a reçu des appuis. Quand les scores des échelles QEP ont été tracés pour chaque niveau de la variable SSI de satisfaction générale, pour tous les élèves de l'échantillon, les moyennes des échelles *Situation personnelle et Environnement du Cégep* ont grimpé à de plus hauts niveaux de satisfaction générale (les élèves pour qui les expériences ont le plus facilité leurs études ont été plus satisfaits).

Quand les scores QEP des élèves à niveau faible et élevé de satisfaction générale ont été comparés, d'importantes différences ont été constatées pour les étudiants et étudiantes sans incapacité sur l'échelle *Situation personnelle* du QEP et pour les étudiantes sans incapacité seulement sur l'échelle *Environnement du Cégep* du QEP. De plus, la différence pour les étudiants était plus grande que pour les étudiantes sur l'échelle *Situation personnelle*, ce qui indique une association potentiellement plus forte entre les facteurs de *Situation personnelle* et la satisfaction des étudiants, comparativement aux étudiantes.

Les éléments du QEP les plus fortement reliés à la satisfaction générale pour les étudiants sans incapacité se sont avérés être les *Expériences scolaires antérieures* ( $r = 0,34$ ) et les *Ami(es)* ( $r = 0,33$ ), suivis du *Degré de motivation personnelle* ( $r = 0,30$ ). Tous ces éléments font partie de l'échelle *Situation personnelle*. Les étudiants pour qui ces facteurs ont le plus facilité leur expérience ont été plus satisfaits. Et si la moyenne pour l'échelle *Environnement du Cégep* n'était pas significativement reliée à la satisfaction générale des étudiants, nous avons cependant constaté que deux éléments de cette échelle y étaient plus étroitement liés : l'*Attitude des professeurs* ( $r = 0,24$ ) et l'*Attitude des étudiants* ( $r = 0,28$ ).

Les éléments du QEP les plus fortement reliés à la satisfaction générale pour les étudiantes sans incapacité se sont avérés être l'*Ouverture des professeurs à adapter les cours en fonction de mes besoins* ( $r = 0,27$ ) et l'*Attitude du personnel non enseignant* ( $r = 0,23$ ). Ces deux éléments font partie de l'échelle *Environnement du Cégep*. Les plus importants

éléments de l'échelle *Situation personnelle* pour les étudiantes ont été la *Situation financière* ( $r = 0,21$ ) et le *Travail rémunéré* ( $r = 0,21$ ).

Même si la petite taille de l'échantillon n'a pas permis d'établir une comparaison des élèves ayant une incapacité selon leur sexe, une évaluation générale des élèves ayant une incapacité a été entreprise. Les résultats suggèrent que pour le QEP, les facteurs *Environnement du Cégep* sont peut-être plus reliés que les facteurs *Situation personnelle* à la satisfaction des élèves ayant une incapacité, car seule l'échelle *Environnement du Cégep* a révélé une différence significative entre les élèves dont la satisfaction générale était la plus élevée et la plus basse. Cette différence pourrait toutefois être attribuée au plus grand nombre d'étudiantes dans l'échantillon. Deux des éléments de l'échelle *Environnement du Cégep* affichaient une importante corrélation avec la satisfaction générale : la *Disponibilité des ordinateurs dans le Cégep* (pour les étudiants seulement) et la *Disponibilité du matériel de cours* (pour les étudiantes seulement).

*10. Les scores du SSI et du QEP (qui mesurent les facteurs postérieurs à l'entrée au collégial) devraient améliorer les prédictions d'attrition et de rendement scolaire que nous avons développées à l'aide de caractéristiques antérieures à l'entrée au collège, telles que les résultats scolaires au secondaire et les variables démographiques.*

Même si les résultats ne peuvent être considérés comme concluants étant donné la petite taille de l'échantillon de répondants au QEP, les données suggèrent que l'échelle *Situation personnelle* du QEP et la variable de satisfaction générale du SSI ont des capacités similaires de prédiction du maintien aux études. Aucun des deux ne constitue un prédicteur puissant, mais les deux produisent à eux seuls des résultats similaires aux prédictions basées sur les résultats scolaires au secondaire.

### **Recommandations**

- Nous devons procéder avec précaution en interprétant la satisfaction étudiante en tant qu'indicateur clé de la performance. Puisque les étudiants semblent attribuer des scores de satisfaction plus bas que ceux des étudiantes, il est possible que les

comparaisons (entre institutions comme entre différents programmes) soient faussées par les différentes proportions d'étudiants des populations collégiales.

- Même si les étudiants ont eu tendance à attribuer des scores de satisfaction plus bas que ceux des étudiantes, l'aspect relié à la nouveauté de l'équipement de laboratoire a affiché une différence plus importante que la moyenne et préoccupe peut-être plus les étudiants que les étudiantes, aussi bien pour les élèves ayant une incapacité que pour les autres. Cet aspect devrait donc faire l'objet d'une attention particulière. Naturellement, les résultats peuvent varier d'une institution à une autre.
- Des différences de satisfaction plus fortes que la moyenne ont également été constatées entre les étudiants et étudiantes ayant une incapacité, sur des aspects tels que l'information sur ce qui se passe sur le campus, l'engagement de l'institution envers les élèves à temps partiel, la flexibilité des politiques de changement de cours (abandon/ajout), la façon dont les services d'orientation aident les nouveaux élèves à s'adapter au collège, et la façon dont le personnel des services de recrutement et d'admission est sensible aux requêtes et besoins spéciaux des élèves. Les scores de satisfaction des étudiants étaient plus bas pour tous ces éléments. Il serait important d'étudier ces différences pour mieux comprendre pourquoi la perception des étudiants et des étudiantes diffère sur ces aspects.
- Les résultats ont clairement montré que la majorité des élèves ayant une incapacité inscrits aux services adaptés offerts sur le campus étaient plus satisfaits, et trouvaient leurs études plus faciles que les élèves ayant une incapacité qui ne s'y étaient pas inscrits. Il faudrait donc sensibiliser les élèves ayant une incapacité à l'existence des services qui leur sont offerts. Il apparaît donc important de trouver de nouveaux moyens de promouvoir les services adaptés afin de les rendre plus attrayant.
- Les besoins des étudiants ayant un trouble d'apprentissage devraient être étudiés plus en détail, car ceux-ci constituent le moins satisfait des groupes étudiés. Et ce, même en y incluant les étudiants inscrits aux services adaptés offerts sur le campus.

- Puisque l'*Efficacité de l'enseignement* s'est révélée de première importance pour tous les groupes étudiés, que cet aspect affichait l'un des plus grands « écarts de performance » (différence entre l'importance et la satisfaction), et qu'il constituait un important facteur de la réponse des élèves à la question *Si c'était à refaire, vous inscririez-vous dans cet établissement?*, il faudrait lui accorder une attention spéciale afin d'assurer de hauts niveaux de satisfaction.

Puisque le taux de maintien aux études n'augmente guère au-dessus d'un certain taux de satisfaction à l'échelle SSI, les éléments ayant obtenu un score de moins de cinq devraient devenir prioritaires. Ils peuvent varier selon l'institution. Selon la présente étude, les éléments les moins satisfaisants sur l'échelle de l'*Efficacité de l'enseignement*, pour les étudiants comme pour les étudiantes, étaient liés aux relations avec le corps enseignant (L'enseignant comprend les circonstances de vie uniques de chaque élève; L'enseignant se préoccupe de mes problèmes scolaires; L'enseignant tient compte des différences entre les élèves en donnant un cours).

- La plus grande part de variabilité dans la mesure de satisfaction indirecte (si c'était à refaire, l'élève s'inscrirait-il dans cet établissement) provenait de l'aspect le plus étroitement relié à la satisfaction générale : *L'expérience d'étudier sur ce campus est agréable*. Cela valait pour les étudiants et les étudiantes, ayant une incapacité ou pas. Un accueil mettant les élèves à l'aise, un personnel et des enseignants attentionnés et coopératifs, la création d'un sens d'appartenance et d'un environnement favorisant la croissance intellectuelle des élèves, tous ces éléments ont contribué à une expérience collégiale positive pour les élèves. Le maintien d'un taux de satisfaction élevé sur ces aspects est important, car ce sont les facteurs qui influencent le plus pour les élèves la perception d'un collège offrant une expérience éducative positive et agréable. La façon dont les élèves relatent leurs expériences collégiales à leurs proches aura, ultimement, un impact sur la réputation de l'institution dans la collectivité.

- La *Disponibilité des ordinateurs dans le cégep* (pour les étudiants ayant une incapacité seulement) et la *Disponibilité du matériel de cours* (pour les étudiantes ayant une incapacité seulement) sont importantes pour ces deux groupes car ces éléments sont les plus reliés à la satisfaction générale. Il est donc nécessaire de les gérer de façon à répondre aux besoins de ces groupes. Les besoins des deux groupes peuvent être satisfaits grâce à l'utilisation de la technologie adaptée.
- Un élément du QEP (*Disponibilité de tutorat à l'extérieur du cégep*, non associé aux échelles *Situation personnelle* ou *Environnement du Cégep*) était fortement relié à la satisfaction générale pour les élèves ayant une incapacité. Ces élèves devraient être sensibilisés aux bénéfices du tutorat privé et il faudrait leur rendre facilement accessible l'information sur la disponibilité de ce type de service. De plus, des programmes de tutorat pourraient être disponibles à même l'institution à laquelle appartient l'élève. De tels programmes pourraient être centrés sur l'acquisition de stratégies d'apprentissage permettant aux élèves ayant une incapacité de surmonter les défis occasionnés par celle-ci.

## **Satisfaction and College Success**

### *A Comparison by Sex and Disability*

#### **Executive Summary**

##### **Objectives**

We evaluated students' satisfaction with aspects of college life and its relation to grades and retention. We compared scores of males and females as well of students with and without disabilities. We also explored the relationship between personal and college related obstacles and facilitators, on the one hand, and satisfaction and academic success on the other. The goals of our research were (1) to determine whether males and females with and without disabilities differ in what they consider important aspects of college life and how satisfied they are with these aspects, (2) to investigate whether satisfaction with diverse aspects of college life is linked to the perceived ease or difficulty experienced with one's studies, (3) to determine whether satisfaction and perceptions of difficulty are able to reliably predict grades and whether students will complete their studies, and (4) based on the findings, to recommend interventions that will ameliorate attrition and poor academic grades for males and females with and without disabilities.

##### **Method**

Included in the study were 6065 students enrolled in two and in three year college diploma programs. Three hundred and ninety-four had a disability (Females: N = 220; Males: N = 174) and 5671 had no disabilities (Females; N = 3479; Males: N = 2192). Of the 394 students with disabilities, 192 (49%) had registered with the college's disability service provider.

We examined feedback provided by students on two survey instruments: the Noel-Levitz Student Satisfaction Inventory (SSI: Shreiner & Juillerat, 1994) and the College/Cegep Experience Questionnaire (CEQ: Fichten, Jorgensen, Havel & Barile, 2006).

On the SSI students rate the extent to which they feel they are satisfied that their institutions are meeting their expectations in a variety of areas. A seven point satisfaction scale is used: (*Not at all satisfied (1); Somewhat dissatisfied (2); Dissatisfied (3); Neutral*



(4); *Somewhat satisfied* (5); *Satisfied* (6); *Very satisfied* (7). They also rate the importance of the same areas using a seven point importance scale ranging from *Not at all important* (1) to *Very important* (7). Satisfaction items can be analyzed on an item-by item basis. The measure also provides twelve scale scores and a single overall satisfaction score. A "performance gap" score is calculated by subtracting satisfaction from importance scores to give a measure of how close the institution comes to meeting students' expectations. A larger gap is interpreted as students' expectations are not being met, a smaller gap indicates that students' expectations are closer to being met, and a negative gap suggests that students' expectations are being exceeded. In addition, two summary items were used in our analyses: *Rate your overall satisfaction with your experience here thus far* (7 point satisfaction scale) and *All in all, if you had to do it over again, would you enroll here?* (7 point scale – *definitely not to definitely yes*).

SSI data from the Community College and the Canadian National data sets were provided by Noel-Levitz Inc. Data on participants' disability status was not available. Therefore, we were only able to use data relating to students' disabilities when examining our college's results.

Two scales (Personal Situation and Cegep Environment) of the CEQ were used in the present study along with a total scale score. Higher scores indicate that the aspects evaluated made students' academic lives easier, and lower scores indicate the aspects evaluated made students' academic lives harder.

## **Findings and Conclusions**

The following summarizes the findings related to the questions raised by our hypotheses.

1. *Do males and females differ in what they believe are important aspects of the college experience?*

Our hypothesis that males and females would differ on what aspects of their college experience they consider to be important was not supported. Although there was an overall tendency for males to score importance items lower than females, there was a strong correlation between male and female scores on the importance scales, and this was true for

both students with and without disabilities. All groups ranked *Instructional Effectiveness* highest in importance. However, one obvious difference between the sexes was the relatively higher importance assigned to *Safety and Security* by females in the Community College sample. In addition, males with disabilities ranked *Campus Support Services* higher and *Admissions and Financial Aid* lower than did females with disabilities.

2. *Do students with and without disabilities differ in what they believe are important aspects of the college experience?*

Our hypothesis that students with and without disabilities will not differ in what they believe are important aspects of the college experience was supported. The relative importance of the scale items for students with disabilities in our sample correlated strongly with those of students without disabilities. This was true for both sexes.

3. *Are females (both those with and without disabilities) more satisfied with their college experiences than their male counterparts?*

We found that, generally, males across colleges in North America had satisfaction scores that were below those of their female counterparts. These differences persisted even when we co-varied grades with satisfaction in our study sample. However, males and females were more or less satisfied with the same things and SSI satisfaction scores were highly correlated for all groups examined. However, the fact that (1) male overall satisfaction fell below female satisfaction for all scales and samples tested, (2) the peaks and troughs of satisfaction on the twelve scales were similar, and that (3) the average item and scale scores were highly correlated suggest that the difference in satisfaction between the sexes may, in fact, be a reflection of a general tendency by males to score items lower than females, rather than these being due to real differences in the sexes in the areas with which they were satisfied or dissatisfied. It is noteworthy that satisfaction with equipment in the lab facilities being current had a larger than average difference, and may be an area of greater concern for male than for female students, both with and without disabilities

Larger than average differences in satisfaction were also found between males and females with disabilities on items relating to knowledge concerning what's happening on campus,

the institution's commitment to part-time students, the reasonableness of course change (drop/add) policies, how new student orientation services help students adjust to college, and how student recruitment and admissions personnel respond to prospective students' unique needs and requests. Females were more satisfied than males.

4. *Do students with disabilities express the same level of satisfaction with their college experience as those without disabilities?*

Our hypothesis that students with disabilities would express the same level of satisfaction with their college experiences as those without disabilities was not supported. Overall, males and females with disabilities expressed lower levels of satisfaction than their non-disabled peers on the global satisfaction variable as well as on five of the twelve subscales. However, this was dependent on whether or not the student had registered for campus disability services.

5. *Are students with disabilities who register for disability related services from the college more satisfied than either students with disabilities who do not register or students without disabilities?*

Registering for disability related services on campus appears to have a different association with satisfaction depending on sex and the nature of students' disabilities. Generally, satisfaction scores of females with both learning disabilities (LD/ADD) and with disabilities other than LD/ADD were similar to those of non-disabled females. Indeed, the satisfaction scores of females who had registered for disability related services was higher than those of females with disabilities who did not register. Thus, it seems, that for females with disabilities, registering for disability related services 'levels the playing field' relative to females without disabilities.

However, the pattern for males with LD/ADD seems to suggest that they were less satisfied than males without disabilities, regardless of whether or not they had registered for disability related services. Males with disabilities other than LD/ADD, on the other hand, not only had satisfaction levels equivalent to that of their non-disabled peers, but in certain areas they expressed even greater satisfaction. Males with disabilities other than LD/ADD

who had registered for disability related services were more satisfied with many aspects of their college life compared to both unregistered males and to males without disabilities.

6. *Is low student satisfaction with the college experience related to lower retention rates for all sub-groups in the study?*

Students who were more satisfied tended to have higher retention rates. Between those with the lowest and highest overall satisfaction, the difference in retention rate averaged about 10%. This was true for both males and females with and without disabilities. With the exception of males with disabilities, this difference in retention disappeared when grades were used as a covariate. Thus, it is difficult to tell whether it was higher grades or higher satisfaction that was associated with higher retention.

However, for males with disabilities, both satisfaction and grades made separate contributions, although in the logistic regression grades dominated. Even here, the changes were small, with overall satisfaction adding little to the ability to discriminate between the two groups once grades were taken into consideration. The relationship was not linear. The upward trend in satisfaction tended to flatten at satisfaction scores above five. Thus, once a certain level of satisfaction was reached, there was no further improvement in the retention rate. Although only a weak predictor of retention for all groups, it was a better predictor of retention for students with disabilities than for their non-disabled peers.

We used the item, *All in all, if you had to do it over, would you enroll here again?* as an indirect measure of satisfaction, since dissatisfied students are unlikely to respond positively to this question. Although the twelve SSI satisfaction scale variables and many items had relatively high correlations with responses to this question, the strongest correlation proved to be with SSI overall satisfaction. Moreover, most of the variability in the decision to enroll again question, for all groups, was accounted for by one item: *It is an enjoyable experience to be a student on this campus.* Making students feel welcome on campus, caring and supportive service staff and faculty, creating a sense of belonging and an environment where students can experience intellectual growth all contributed to students having an enjoyable experience on campus.

7. *Is low satisfaction with Instructional Effectiveness the strongest predictor of academic performance?*

The data did not support the hypothesis that satisfaction with *Instructional Effectiveness* would be the strongest predictor of academic grades. Global satisfaction was more strongly correlated with grades than was satisfaction with *Instructional Effectiveness*. None of the satisfaction variables we tested were strong discriminators between those with high and low grades. When the scale variables were tested, *Instructional Effectiveness* did not enter the model for males, but it did enter for females. The scale variables operating together had were best able to discriminate between those with high and low grades. However, even in this case the association was weak.

8. *Do students with the largest "performance gap" between the aspects of college life they consider important and their satisfaction with these aspects have the highest rate of attrition?*

For the SSI scales where performance gap sizes (a larger gap means students' expectations are not being met) showed a correlation with retention rate, the correlations were weak. The scales that showed differences between low and high gap sizes depended on sex and disability. For students without disabilities, *Instructional Effectiveness* had the strongest correlation for females and *Admissions and Financial Aid* for males. The only scale showing a significant correlation for students with disabilities was *Safety and Security*, and this for females only.

The difference in retention rates between low and high gaps on the *Admissions and Financial Aid* scale was 8% for males without disabilities. There was an even larger difference for females with disabilities (20%). The difference for males with disabilities, although large (15%), was not significant as the sample size was small. The difference of 2.1% for females without disabilities was not significant, although the direction of the difference was the same as for the other groups.

The gap on the *Instructional Effectiveness* scale, which was significantly correlated with retention for females without disabilities only, showed a difference in retention of 5.9%.

This became non-significant when co-varied with grades. However, the *Admissions and Financial Aid* gap variable remained significant for males without disabilities and for females with disabilities, even when adjusted for grades.

9. *Do students who have higher overall satisfaction scores on the SSI experience their college studies as easier (i.e., do they have higher scores on the College/Cegep Experience Questionnaire (CEQ))?*

There was support for our hypothesis that there would be a correlation between CEQ scores and SSI overall satisfaction. When the CEQ scale scores were plotted for each level of the SSI overall satisfaction variable for all students in the sample, both the average *Cegep* and *Personal* scale averages increased at higher levels of overall satisfaction (i.e., students who found their experiences more facilitating were more satisfied).

When CEQ scores of students with low and high levels of overall satisfaction were compared, there were significant differences for both males and females without disabilities on the CEQ *Personal* scale and for females without disabilities only on the CEQ *Cegep* scale. Moreover, the difference between high and low overall satisfaction on the *Personal* scale was larger for males than that for, indicating a potentially stronger association between *Personal* factors and the satisfaction of males compared to females.

The CEQ scale items showing the highest correlations with overall satisfaction for males without disabilities were *Previous Educational Experience* ( $r = .34$ ) and *Friends* ( $r = .33$ ), followed by *Level of Personal Motivation* ( $r = .30$ ). All of these are on the *Personal* scale. Males who found these factors more facilitating were more satisfied. Although the overall *Cegep* scale average was not significantly correlated with overall satisfaction for males, two items on the scale were correlated with this: *Attitudes of Professors* ( $r = .241$ ) and *Attitudes of Students* ( $r = .279$ ).

The CEQ items showing the highest correlation with overall satisfaction for females without disabilities were *Willingness of Professors to Adapt Courses to My Needs* ( $r = .27$ ) and *Attitudes of Non-teaching Staff* ( $r = .23$ ). Both these items are on the *Cegep* scale. The

most important *Personal* scale items for females were *Financial Situation* ( $r = .209$ ) and *Paid Employment* ( $r = .210$ ).

Although it was not possible to do a comparison of students with disabilities by sex due to the small sample size, an overall evaluation of students with disabilities was undertaken. The outcome suggests that CEQ *Cegep* factors may be more important than CEQ *Personal* factors for the satisfaction of students with disabilities, as only the *Cegep* scale means showed a significant difference between those with low and high overall satisfaction. However, this may have been due to the larger number of females in the sample. Two individual items on the *Cegep* scale showed significant correlations with overall satisfaction: *Availability of Computers on Campus* (for males only) and *Availability of Course Materials* (for females only).

10. *Both SSI and CEQ scores (which measure post-college entry factors), will improve the prediction of attrition and academic performance that we developed using pre-college entry characteristics such as high school grades and demographic variables.*

Although the results are inconclusive due to the small sample size of CEQ respondents, the data suggest that the CEQ *Personal* scale and the SSI overall satisfaction variable are similar in their ability to predict retention. Neither are strong predictors, but both produce results on their own that are similar to using high school grades.

### **Recommendations**

- Care is required when interpreting student satisfaction as a key performance indicator. Since males appear to score satisfaction lower than females, comparisons between institutions or different academic programs may be biased due to different proportions of males in the population.
- Although males tended to score satisfaction lower than females, the item relating to equipment in lab facilities being current had a larger than average difference and may be of greater concern for males than females, for both students with and without

disabilities. Consequently, this area should be a focus of attention. Of course, this may vary from institution to institution.

- Larger than average differences in satisfaction were also found between males and females with disabilities on knowing what's happening on campus, the institution's commitment to part-time students, the reasonableness of course change (drop/add) policies, how new student orientation services help students adjust to college, and how student recruitment and admissions personnel respond to prospective students' unique needs and requests. Males scored lower in all these areas. It is important to focus on these differences in order to develop an understanding of why male and female perceptions differ in these areas.
- There was clear evidence that the majority of students with disabilities who register for campus disability services were more satisfied, and found their studies easier, than students with disabilities who did not register. Consequently, students with disabilities need to be made aware of the services available to them. It may be necessary to find new ways of promoting services to students with disabilities in order to make them more appealing.
- The needs of males with learning disabilities should be studied more carefully, as they were the least satisfied of the groups we studied. This was true even for those males who had registered for campus disability related services.
- As *Instructional Effectiveness* ranked highest in importance for all groups we studied, and had one of the largest "performance gaps" (i.e., difference between importance and satisfaction), and was an important factor in the students response the question asking whether they would enroll again at the institution, this area needs to be given special consideration in order to ensure high levels of satisfaction in this area.

Since retention rates do not increase to any great extent when satisfaction reaches above a certain level on the SSI scale, items that have scores below five need to be a



priority. These may vary depending on the institution. In the present study, the items with the lowest satisfaction on the *Instructional Effectiveness* scale for both males and females were related to interactions with faculty (Faculty are understanding of students' unique life circumstances; Faculty are interested in my academic problems; Faculty take into consideration student differences as they teach a course).

- Most of the variability in the indirect measure of satisfaction (i.e., whether the student would enroll again if given the opportunity) was accounted for by one item which also had the highest correlation with overall satisfaction: *It is an enjoyable experience to be a student on this campus*. This was true for males and females with and without disabilities. Making students feel welcome on campus, caring and supportive service staff and faculty, creating a sense of belonging and an environment where students can experience intellectual growth, all contributed to overall satisfaction and students having an enjoyable experience on campus. Maintaining high satisfaction in these areas is important, as these are the most important factors influencing students' perceptions of their college as providing a positive and enjoyable educational experience. How students relate these experiences to friends and family will, ultimately, have an impact on the institution's reputation within the community.
- *Availability of computers on campus* (for males with disabilities only) and *Availability of course materials* (for females with disabilities only) were important for these two groups as these had the strongest relationship with overall satisfaction. These areas need to be managed in a way that meets the needs of these groups. Both can be tied together through the use of adaptive technology.
- One CEQ item (related to private tutoring outside the college, and not associated with either the *Personal* or *Cegep* scales) was strongly related to overall satisfaction for students with disabilities. Students with disabilities should be made aware of the benefits of private tutoring and information concerning the availability of this service needs to be made readily available to them. Programs of one-on-one tutoring on

campus can be developed or expanded with a focus on learning strategies that help students overcome the challenges associated with their disability.

## **Acknowledgements**

We would like to express our appreciation for the generous support of la Programme d'aide à la recherche sur l'enseignement et l'apprentissage (PAREA, Quebec) and Dawson College, without which this research would not have been possible.

# Satisfaction, Perceptions of Difficulty and Academic Achievement

## A Comparison by Sex and Disability

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## 1 Background

Colleges and other post-secondary institutions are interested in student satisfaction as they believe it has a positive influence on retention and academic performance, and that it impacts on recruitment and motivation. The use of satisfaction as a tool in retention management is largely rooted in a business model of customer satisfaction where attempts are made to maximize revenues by maximizing the duration of a supplier's relationship with individual customers. If this perspective is brought to bear on higher education, then what is applicable to consumers generally, can more specifically be applied to students. (Douglas, McClelland & Davies; 2007; Kara & de Shields Jr., 2004; Bolton 1998). Archambault (2008) reviews the evolution of various theoretical frameworks from which the service quality model in higher education has evolved. However, some argue that as students are partners in the learning relationship the supplier customer business model may not apply, or at least is not as clear cut as in other service relationships (Yorke, 1999).

Betz et al (1969) in reviewing the early research studies prior to 1969 concluded that research on student satisfaction was non-systematic and provided little basis for generalizations and conclusions. In addition the instruments used in the studies had unknown psychometric properties. Since then a number of instruments have been developed and validated to measure student satisfaction for different institution types and purposes. (Examples include the Student Experience in the Research University (SERU) survey (Chatman, 2009; Stebleton, Huesman Jr. & Kuzhabekova., 2010) designed specifically for research universities; the Student Satisfaction Inventory (SSI), published by Noel-Levitz (Shreiner & Juillerat, 1994) and designed for universities and colleges, with a version modified to for use in Canadian two-year colleges.

A study conducted by Kara and de Shields (2004) argues that the satisfaction - intention - retention link should be carefully studied and managed as dissatisfied students could cut the number of courses they take, or drop out of college altogether. Their study was based largely on the social psychology models of Ajzen's theory of planned behavior ((TPA) (Ajzen, 1991, 2002)). The theory proposes that attitudes predict intentions which, in turn, predict behavior. Applied to the student retention problem, Kara and de Shields (2004)

hypothesize that students' satisfaction leads to intentions to stay which in turn results in improved retention. Their study focused on the concepts of Faculty (Understanding, Accessible Helpful, Provide Feedback), Classes (Real World Relevance, Scheduling), and Academic Advising (Understanding, Accessible, Helpful, Reliable, Responsive). They proposed that these factors were important, and a student's level of satisfaction with these aspects of their college experience would influence, therefore, the intention to stay or leave. Although the study indicated that students' college experiences were positively related to their satisfaction and intention to stay at college or university, their data did not address the actual retention part of their hypothesis.

Hatcher et al. (1992) used an investment model, usually applied to predicting satisfaction, commitment and turnover in business organizations, to examine students' commitment to college and their enrollment behavior. Investment model variables (rewards, costs, alternative value, investment size) were seen to predict satisfaction and commitment. Commitment was predicted to influence behavior (ie whether the student would re-enroll). In their model a distinction is made between satisfaction and commitment. Satisfaction was defined as the "*positive affect that the student associates with their college or university*", whereas institutional commitment "*refers to a student's intention to remain enrolled, independent of his or her affective evaluation of the school*". Satisfaction was seen to influence commitment along with the attractiveness of available alternatives as well as investment size (the amount of time and resources invested in being a student). The results of the Hatcher et al. study showed that (a) institutional commitment was positively correlated with enrollment behavior and (b) satisfaction, alternatives available to the student, and investment size each made independent contributions to the prediction of commitment. Satisfaction was found to be significantly correlated with rewards, costs, alternative value and investment size. An interesting finding was that cost did not make a significant contribution to retention. Reenrollment was best predicted by high scores on rewards and investment size and low scores on alternative value. However, the best of the models they tested accounted for less than one-third of the variance in enrollment behavior. Moreover, the study was conducted at a four year comprehensive institution and the sample size was small (N = 174) and did not permit the analysis of subgroups. Because it was a



single institution study it was unclear as to how effective the model would be in other settings.

Despite the widely held belief that satisfaction and retention are linked, there is little empirical evidence to demonstrate whether improving satisfaction is effective in terms of predicting the retention of students. Schreiner (2009) used the Student Satisfaction Inventory (SSI) published by Noel-Levitz and developed by Schreiner and Juillerat (1994) to examine whether student satisfaction was predictive of retention in four year institutions (beyond what could be predicted based on student demographic and institutional characteristics). They conducted a study of over 27,000 students at 65 four-year institutions. Two methods were used to determine the extent to which student satisfaction predicted subsequent retention. The first was a logistic regression analysis, using students' enrollment status (either enrolled or not enrolled) four to twelve months after they completed the SSI. They found that the factors that predict retention differed by students' level of advancement in their studies. First-year student retention was best predicted by the Campus Climate scale and Overall Satisfaction, in that order. In particular, the best predictors for first year students included advisor availability, feeling a sense of belonging, and perceiving and feeling that the campus is a safe place. However, by the time students reached their senior year, satisfaction contributed little to retention. Demographic characteristics did not predict much of the variance in retention either, a finding consistent with our previous study where a wide range of demographic variables were tested in logistic regression models of retention for students in their first year of college (Jorgensen, Fichten & Havel, 2009). However, the Schreiner study found that these variables were more predictive for students in more senior years.

The second approach used in the Schreiner (2009) study used a method commonly employed in consumer research, and explored the relationship between students' satisfaction levels and whether they felt they had chosen the right institution (ie in retrospect, would they 'repurchase' an education at the same institution). Since retention is complex and can be impacted by factors beyond the control of the institution, it is likely that even some satisfied students may leave before completing their program of studies.

Alternatively, students may be dissatisfied with their institution and continue with their studies if they are motivated enough to do so (Pattengale, 2006). However, if students have positive feelings (ie were satisfied with their experiences), then it is likely they would make the same decision to enroll at the institution if they had to choose again. This is important for the institution's reputation and its future ability to recruit and retain students. This indirect link to satisfaction was also tested in the Schreiner study. Using as the criterion variable, the item: *All in all, if you had it to do it over again, would you enroll here?* a set of hierarchical multiple regression analyses were run. They found that, after correcting for student characteristics and institutional features, 35 percent of the variance in students' responses to this item was accounted for by their responses to eight satisfaction scales. The Campus Climate scale was the best predictor of a student's intention to enroll again.

Douglas and Mclelland (2007) also used a customer loyalty approach. To identify factors most likely to have either a positive or negative impact on the loyalty behaviors of students (e.g. intent to repurchase, actual repurchase and referrals and endorsements), they used Critical Incident Technique (CIT), an approach often used in service quality research and which differs from that of traditional student feedback questionnaires. The underlying philosophy of this approach is that the customers (in this case students) are the best judges of service quality. As students interact with teachers, administrators and managers, it is the sum of these interactions that influences their overall impression and evaluation of services. However, not all interactions lead to a change in loyalty to the institution and separating those satisfiers and dissatisfiers that are critical is important in order to avoid inappropriate allocation of resources. Students were invited to describe incidents they thought were critical, and likely to change their loyalty behaviors. Using a sample of 163 university students who were invited to fill in an open-ended questionnaire, the study found three themes to be important aspects of the teacher, learning and assessment as well as the ancillary services areas. These were responsiveness (e.g. no run around, helpful office staff), communication (e.g. interactions with tutors) and access (e.g. to library, communications technology, child care).

Hagedorn, Moon, Maxwell and Pickett, as part of the Transfer and Retention of Urban Community College Students (TRUCCS) project (1999 – 2006), attempted to isolate and define the factors that predict academic success from the community college perspective. They examined the link between aspects of student life and community college course completion, which they used as a measure student persistence. Their model built on the theoretical work of Fishbein and Ajzen (1975) as well the Quality of Student Life construct of Benjamin (1994). Using the Benjamin typology, they classified their model's constructs and items into four categories: 1) conditioning (e.g., poverty, age, sex, English ability); 2) independent (e.g., High school and college GPA, obstacles); 3) mediating (e.g., reasons for coming to college, academic attitude) and 4) dependent variable (persistence, student life - of which quality is a feature). An interesting and counterintuitive finding of their study related to the independent scale variable labeled “obstacles.” While being the strongest negative predictor of student life (direct effect =  $-.571$ ), it was a positive predictor of course completion (direct effect  $+.541$ ). Thus, while obstacles may have been related to a problematic student life, these did not interfere with course completion.

The reciprocity of the relationship between satisfaction and academic grades for college students was examined by Bean and Bradley (1986) using path analysis. They developed a model that would allow them to assess the reciprocity between satisfaction and academic performance (GPA) by sex, and identify the factors that were most important to each. Seven variables believed to influence satisfaction were included in the model. These were institutional fit, academic integration, utility (perception of the benefits of education), course difficulty, social life, membership of campus based organizations and class level. The study found that for females the relationship was reciprocal, and the effect of GPA on satisfaction was stronger than the effect of satisfaction on GPA. For males they found a non-reciprocal relationship, where there was no effect of satisfaction on GPA and only a slight effect of GPA on satisfaction.

Designing a methodology suitable for measuring satisfaction of a diverse student body is difficult as students respond to their environment in a variety of ways. To date, most studies undertaken that have examined satisfaction as well as other variables and their impact on retention have tended to aggregate data in ways that may mask important differences that exist among different groups that make up increasingly diverse multi-

cultural populations. For example, Stebleton, Huesman, Jr. and Kuzhabekova (2010) found that satisfaction and sense of belonging of immigrant students was lower than that of their non-immigrant peers. Donahue & Wong (1997) found support for the notion that traditional and nontraditional (aged over 25) students differ in the pattern of correlations between satisfaction with the college experience and achievement motivation. Moro-Egido & Panades (2008) found differences in satisfaction depending on whether or not students studied full or part-time. Moreover, differences in student satisfaction by sex and disability have not been explored in any detail. One Quebec study that we could find was undertaken by L'Association Québécoise Inter-Universitaire des Conseillers aux Etudiants Ayant des Besoins Spéciaux (l'AQICEBS) (2008) and examined satisfaction of students with disabilities in Quebec universities in 2007 - 2008. However, it did not break down the data by sex. As pointed out by Albert (2010), it may prove useful to disaggregate the data and examine the attrition of different groups that may have different needs, and require different strategies, rather than adopting a retention effort with a one-size-fits-all mentality.

## **2 Main Objectives of the Study**

This investigation takes a more disaggregated approach in examining the link between satisfaction and a student's likelihood of persisting at Cegep, by examining both sex and the presence or absence of a disability. The impact of personal and college factors are also explored. The models we developed in our previous research used only pre-entry data and were confined to first year college students (Jorgensen, Fichten, & Havel, 2009). Here, we expand on our earlier work by examining post-entry factors related to satisfaction with the college environment as well as obstacles and facilitators of college success. More specifically, the goals of our proposed research are 1) to determine whether our subgroups differ in their satisfaction and importance ratings concerning a number of aspects of college life, 2) to investigate whether low satisfaction scores are linked to how easy or difficult students experienced their college studies to be, 3) to determine if satisfaction/perceptions of difficulty are able to reliably predict retention, and 4) based on our findings, recommend interventions that will ameliorate attrition and poor academic performance for the targeted sub-groups.

Our hypotheses are as follows:

- 1) Males and females will differ in what they believe are important aspects of the college experience.
- 2) Students with and without disabilities will not differ in what they believe are important aspects of the college experience.
- 3) Females (both those with and without disabilities) will be more satisfied with their college experiences than their male counterparts.
- 4) Students with disabilities will express the same level of satisfaction with their college experience as those without disabilities.
- 5) Students with disabilities who are registered for disability related services from the college will be more satisfied than either students with disabilities who are not registered, or students without disabilities.
- 6) Low student satisfaction with their college experience will be related to higher attrition rates for all sub-groups in the study.
- 7) Low satisfaction with *Instructional Effectiveness* will be the strongest predictor of attrition and academic performance.
- 8) Students with the largest gap between the aspects of college life they consider important and their satisfaction with the extent to which they believe the college meets their expectations in this area, will have the highest rate of attrition.
- 9) Students who have higher overall satisfaction scores on the SSI will experience their college studies as easier (i.e., will have higher scores on the Cegep Experience Questionnaire (CEQ)).
- 10) Both SSI and CEQ scores, which measure post-entry factors, will improve the models of attrition and academic performance that we developed using pre-entry characteristics.

### **3 Method**

The study was conducted at an English Cegep in Quebec that offers two-year diploma programs designed to prepare students for university, and three year career diploma programs in the areas of health science, engineering, theatre and design that train students for entry into the workforce on completion of their diploma. It enrolls between 7000 –

8000 full-time students per year and another 1500 – 2000 students in its continuing education programs. This study includes only full-time students enrolled in diploma programs.

### **3.1 The Survey Instruments**

Two survey instruments were used in the study, the Noel-Levitz Student Satisfaction Inventory (SSI) and the College (Cegep) Experience Questionnaire (CEQ) which was developed and used in our previous research (Fichten, Jorgensen, Havel & Barile, 2006; Jorgensen, Fichten & Havel, 2007).

#### *Student Satisfaction Inventory.*

The Student Satisfaction Inventory (SSI) is published by Noel-Levitz (Shreiner & Juillerat, 1994) and was administered on-line through the Noel-Levitz website. A copy of the survey can be obtained from the Noel-Levitz website:

<http://survey.noellevitz.com/index.cfm?sAction=survey&z=1298477951>

Students are asked to rate the extent to which they feel they are satisfied that their institutions are meeting their expectations in a variety of areas using a seven point satisfaction scale (*Not at all satisfied (1); Not very satisfied (2); Somewhat dissatisfied (3); Neutral (4); Somewhat satisfied (5); Satisfied (6); Very satisfied (7)*). They are also asked to rate the importance of the same areas using a seven point importance scale ranging from *Not at all important (1) to Very important (7)*. A performance gap score can then be calculated for each student's response by subtracting the satisfaction score from the importance score to give a measure of how close the institution comes to meeting students' expectations. A larger gap is interpreted as students' expectations are not being met, a smaller gap indicates that students' expectations are closer to being met, and a negative gap suggests that students' expectations are being exceeded.

Apart from the individual items and twelve satisfaction scales, two of the summary items were used in our analyses:

*Rate your overall satisfaction with your experience here thus far (7 point satisfaction scale).*

*All in all, if you had to do it over again, would you enroll here? (7 point scale – Definitely not – Definitely yes)*

Psychometric characteristics of the scale and the utility for a community college sample cited in both Bryant (2006) and Brackette (2008) have been shown to be excellent. For example, the SSI two-year college version has a Cronbach's coefficient alpha of .97 for the importance scores and .98 for the satisfaction scores. The instrument has a three-week, test-retest reliability coefficient of .85 for the importance scores and .84 for the satisfaction scores. A series of validation studies, cited in Brackette (2008) indicate excellent validity. The survey was administered at Dawson College in 2001, 2002, 2004 and 2009 and the response rates ranged between 20% - 25% of full-time diploma students.

For the purposes of our study we used seventy three-items that were relevant to the study. The ten institution specific items were omitted. As the study focused on students in diploma programs, Item 3 relating to non-diploma programs was left out. Items 17 & 19 were not included in the Canadian two - year version. These items were left out of the scales as well. A list of these items can be found in Appendix 1, and a list of the twelve scales resulting from aggregation of the items can be found in Appendix 2.

#### *The College/Cegep Experiences Questionnaire (CEQ)*

The content of the College/Cegep Experiences Questionnaire / Questionnaire sur les expériences au Cegep (CEQ) is both theoretically and empirically based. Questions were formulated to allow for both item-by-item evaluation as well as evaluation using subscales and a total score. Of the thirty-two items on the scale, twenty-five are applicable to both students with and without disabilities and six are applicable only to students with disabilities. Because the measure was designed to reflect both the key concepts of Fougeyrollas' (2010) PPH model (i.e., personal and environmental obstacles and facilitators) as well as the realities of Cegep students, who encounter personal obstacles and facilitators of their academic success as well as within the Cegep and in the community, we grouped items

into three conceptual subscales: These were 1) *Personal Situation* (9 items including 1 that was applicable to students with disabilities only); 2) *Cegep Environment* (13 items including 1 that was applicable to students with disabilities only) and 3) *Government and Community Supports and Services* (9 items, including 4 that were applicable to students with disabilities only). A total scale score labeled '*Index of Difficulty*' or IDF was also calculated using the twenty-five items that were common to students with and without disabilities. The scale values ranged from 1 – 6 as follows:

*1 (Much harder); 2 (Moderately harder); 3 (Slightly harder); 4 (Slightly easier); 5 (Moderately easier); 6 (Much easier).*

The survey was administered to recent graduates, as well as to a sample of students enrolled at Dawson College in 2004 and 2005. Details of its use and administration can be found in our previous studies (Fichten, Jorgensen, Havel & Barile, 2006; Jorgensen, Fichten & Havel, 2007).

The survey results are stored in databases held at Dawson College. For the purposes of this study the archived CEQ databases were accessed and linked to the SSI databases to identify those students who replied to both the SSI and the CEQ (N = 432). Since we combined CEQ survey data from two survey years, slight adjustments had to be made to the items in the *Cegep* scale as the wording was slightly different; and this is described in one of our previous studies: Jorgensen, Fichten & Havel, 2007. As there were only a small number of students who replied to the *Government and Community Supports* scale on the CEQ, who also replied to the SSI, this study focuses primarily on the *Personal* and *Cegep* scales. The index of difficulty was calculated including only these two scales. The CEQ items and scales included in the study are shown in Appendix 3.

### **3.2 The Survey Populations**

All students who responded to one of the four Noel-Levitz Student Satisfaction Inventories conducted on campus (2001, 2002, 2005, 2009) and who were enrolled in a diploma program at the time they were surveyed are included in the study sample (N = 6065).



For the purposes of this study, students with disabilities were those students who could be identified because they had registered with the campus disability services provider, or they self-reported their disability on the Noel-Levitz Student Satisfaction surveys conducted by Dawson College. The question concerning disability was one of the institution specific questions allowed to be added to the survey. In order to register with the campus disability services provider documentation relating to the nature of a student’s disability is required. Details relating to students’ disabilities are held in a database maintained by the disability services provider. The information relating to the nature of disabilities for registered students was obtained from this source. Table 1 shows a sample breakdown by sex, disability and disability services registration.

**Table 1. Students Enrolled in Diploma Programs Who Replied to the SSI: Breakdown by Sex and Disability Services Registration.**

	1	2	3	
	Registered	Not Registered	No Disabilities	Total
Female	115 <i>60%</i>	105 <i>52%</i>	3479 <i>61%</i>	3699 <i>61%</i>
Male	77 <i>40%</i>	97 <i>48%</i>	2192 <i>39%</i>	2366 <i>39%</i>
Total	192	202	5671	6065

The sample is aggregated into three groups: 1) With disabilities and registered with the disability service provider, 2) With disabilities and not registered with the disability service provider, and 3) No disabilities. Of the 394 students with disabilities identified for inclusion in the study, 192 (49%) had registered with the disability services provider.

The proportion of females and males in the group of students with disabilities who registered for campus based disability services (60% females; 40% males) was similar to that of students without disabilities. However, the students with disabilities who self-reported their disabilities, and did not register for services, consisted of a slightly higher proportion of males (48%).

The breakdown by disability type is shown in Table 2. For the purposes of comparing satisfaction by disability type, we considered two groups: 1) Students with a learning disability and/or attention deficit disorder (LD/ADD) and 2) Students with disabilities other than LD/ADD referred to as 'Other' disabilities. It should be noted that the percentage of the sample falling in the 'Not listed' category is quite high. This is due to the fact we were only able to include only the five disability classifications on the SSI, and these are shown in the Table 2. A more granular classification was possible for students who registered with the disability services provider, as details of the type of disability are stored in a disabilities database. For the registered students who fell in the 'Not listed' disabilities category, 54% of females and 39% of males had chronic medical problems, and it is likely that this is the same for the unregistered group. Students with multiple disabilities were included with the 'Other' group.

About half the students with disabilities who registered with the campus services provider had a documented learning disability or attention deficit disorder or both (LD/ADD), and this was true of both males and females. For unregistered students 19% of females and 24% of males self-reported LD/ADD as their disability, a much lower proportion than that of registered females and males.

The average age of the students in the sample at the time they were surveyed fell between 20 and 21, and this was true regardless of sex, disability type and registration status, with the exception of the thirty-eight male students with 'Other' disabilities who were registered for services. The average age of this group of students was 23.

### **3.3 Determining the Retention Status of Students**

The study population was extracted from the databases, and consisted of all students in diploma programs who responded to the SSI survey in 2001, 2002, 2005, 2009 (N = 6065). Of these, 5671 had no disability, 192 had a disability and were registered for disability related services, and 202 had a disability but had not registered for services. The enrollment status for each of these students was examined in the autumn semester 2009 and the student was deemed to have been retained if they were still enrolled or had graduated.

**Table 2. Disability Sample by Classification of Disability Type And Disability Services Registration.** (*Registered: Students with disabilities who registered with the campus-based disability services provider*).

<b>Females</b>						
Disability	Registered	Not Registered	Total	% Registered	% Not Registered	% Total
1 Visual	4	41	45	3%	39%	20%
2 Mobility	6	2	8	5%	2%	4%
3 Hearing	7	1	8	6%	1%	4%
4 Learning/ADD	57	20	77	50%	19%	35%
5 Not listed above	41	41	82	36%	39%	37%
Total Females	115	105	220	100%	100%	100%
Other (than LDADD)	58	85	143	41%	59 %	100%

<b>Males</b>						
Disability	Registered	Not Registered	Total	% Registered	% Not Registered	% Total
1 Visual	1	34	35	1%	35%	20%
2 Mobility	1	5	6	1%	5%	3%
3 Hearing	3	6	9	4%	6%	5%
4 Learning/ADD	39	23	62	51%	24%	36%
5 Not listed above	33	29	62	43%	30%	36%
Total Males	77	97	174	100%	100%	100%
Other (than LDADD)	38	74	112	34%	66%	100%

<b>Females + Males</b>						
Disability	Registered	Not Registered	Total	% Registered	% Not Registered	% Total
1 Visual	5	75	80	3%	37%	20%
2 Mobility	7	7	14	4%	3%	4%
3 Hearing	10	7	17	5%	3%	4%
4 Learning/ADD	96	43	139	50%	21%	35%
5 Not listed above	74	70	144	39%	35%	37%
Grand Total	192	202	394	100%	100%	100%
Other (than LDADD)	96	159	255	38%	62%	100%

If they had not graduated, or were no longer enrolled at the college at this time, they were deemed to have left their studies at the college. Students who may have left after they replied to the survey, but returned to study at a later date and either completed their diploma or were still enrolled in the autumn semester of 2009, were considered retained. However, it was not possible to determine whether students went on to study at another educational institution, and it is likely that some did so.

### **3.4 Academic Performance - Grades Analysis**

The CRC score (cote de rendement au collégiale), a weighted grade average, was used as the academic performance variable. Although the CRC has a theoretical range of between 0 and 50, in practice, averages tend to range between 15 – 36. We used the students' accumulated CRC as a measure of academic performance. Some students did not have a CRC recorded as they dropped out before they obtained a grade. We defaulted the CRC scores for these students to zero. The modified variable is referred to as CRCM.

### **3.5 Statistical Analyses**

ANOVA and MANOVA were used to compare variable means among the targeted groups. Linear regression modeling and Pearson correlation coefficients compared the strength of the linear relationship between variables.

Binary logistic regression modeling was used to compare how well satisfaction, as well as other variables, predicted retention. We used the Nagelkerke  $R^2$  to compare the strength of association between the independent (e.g., satisfaction) and dependent (e.g., retention) variables. Often described as a pseudo  $R^2$ , it has a theoretical range between 0 - 1, with higher values indicating a stronger association between the variables in question. It serves as a measure of effect size. From the logistic regression models we generated Receiver Operator Characteristics curves (ROCs) from probabilities generated by the models. If we use the rough guide provided by Tape (2008) to evaluate the areas under the curves (AUCs), they were rated as shown in Table 3. The AUC is measure of how well the dependent variable(s) are able to discriminate between the levels of the binary variable (e.g., between retained and not retained).

**Table 3. Rating of Areas Under the ROC Curves Generated from the Logistic Regression Models.**

<b>Area</b>	<b>Rating</b>
.50 - <.60	Fail
.60 - .69	Poor
.70 - .79	Fair
.80 - .89	Good
>=.90	Excellent

#### **4 Comparison of Male and Female Student Satisfaction**

This section of the report addresses the following hypothesis:

*Females (both those with and without disabilities) will be more satisfied than their male counterparts with their college experiences.*

To examine the question of differences in male and female satisfaction with college services, we compared scores of males and females with and without disabilities based on the following SSI variables:

1. The global or overall satisfaction variable (OS)
2. The scores for each of the twelve SSI scales
3. An item by item comparison of satisfaction scores

Comparisons using these were carried out for males and females in this study (by disability), as well as for the Canadian National two-year and Community College data sets provided by Noel-Levitz..

##### **4.1 Comparison of Female and Male Satisfaction - Overall Satisfaction (OS)**

*Canadian National and Community College Data Sets Compared to the Study Group*

We compared overall satisfaction (OS) by sex using a one-way ANOVA for Dawson College and for the Canadian National Two-Year and Community College data sets

separately. Male satisfaction tended to be lower than that of females for students in this study, as well as for the Canadian and Community College comparisons. The Dawson College comparison was statistically significant ( $p < .05$ ). We were unable to determine the statistical significance of the Canadian and Community College samples as unit record data was not available. However, as the sample sizes were larger, and the differences are of the same order of magnitude as for the Dawson sample, it is likely that they are. These differences are shown in Table 4, and graphically in Figure 1. The differential between sexes, which ranged between 0.23 - 0.25, was relatively consistent across the three groups compared.

**Table 4. Comparison of Mean Satisfaction Scores on the Global Satisfaction Item by Sex.** (Male scores minus Females scores).

	Females	Males	Difference	p
<b>1. *Cegep (Dawson)</b>	<b>5.74</b>	<b>5.50</b>	<b>-0.23</b>	< .001
Without Disabilities	5.75	5.54	-0.21	<.001
With Disabilities	5.54	5.09	-0.45	.009
<b>2. Canadian National</b>	<b>5.65</b>	<b>5.40</b>	<b>-0.25</b>	na
<b>3. Community College</b>	<b>5.56</b>	<b>5.33</b>	<b>-0.23</b>	na

*\*Dawson data are based on four survey sessions for students in 2 and 3 year diploma programs who replied to the global satisfaction item. (No Disabilities: Females N = 3391; Males N = 2134; With Disabilities: Females = 216; Males = 172).*

Because the average Cegep grade (CRCM) was lower for males than females it could be argued that the difference in satisfaction was related to the lower grades of males. However, using grades as a covariate in the one-way ANOVA revealed that for students in this study, the difference in satisfaction between the sexes persisted, although grades did have some effect as indicated by the lower F values when the covariate was used (Table 5).

#### *Students with Disabilities*

As was the case for students without disabilities, males with disabilities were less satisfied than their female counterparts (Figure 1). The difference in means between males and females on the OS variable averaged 0.45. This difference was statistically significant

(Table 5) and was larger than for students without disabilities (Mean difference = 0.21). What is also clear from Figure 1 is the low satisfaction of males with disabilities relative to the other groups. As was the case for students without disabilities, the sex difference in satisfaction persisted even when grades were used as a covariate (Table 5).

#### **4.2 Comparison of Female and Male Satisfaction by SSI Scale**

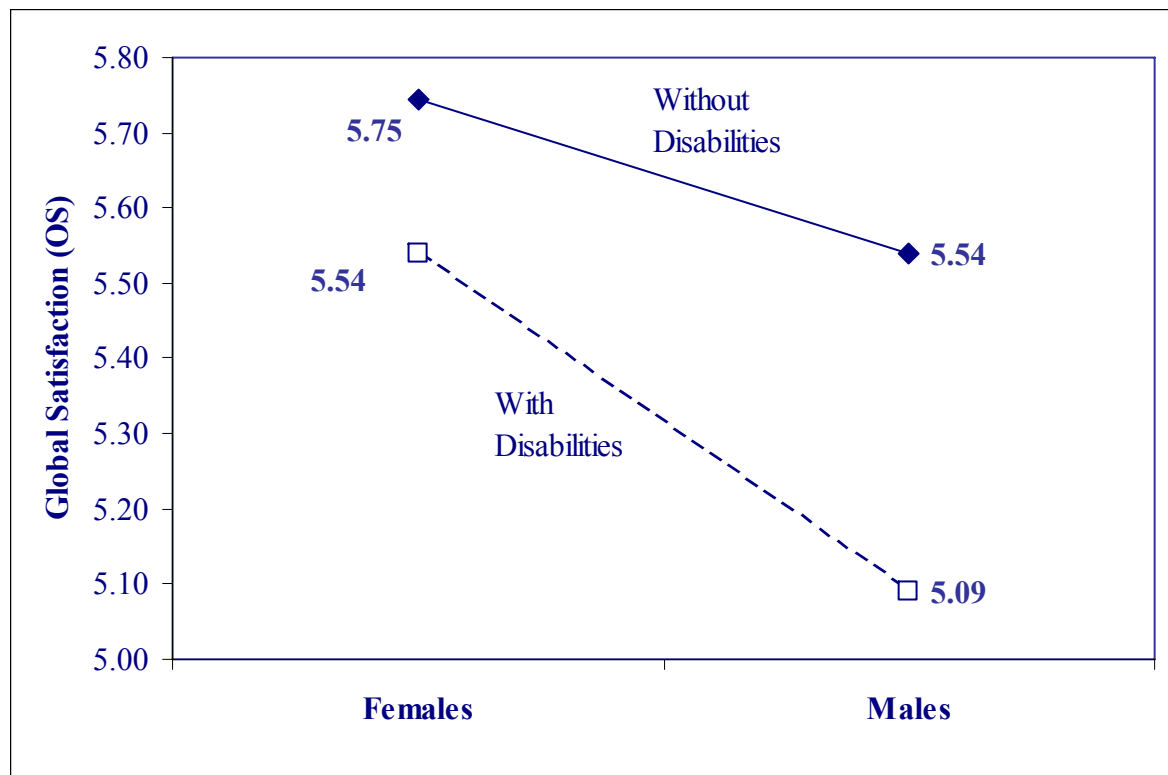
Using MANOVA with mean replacement (2 Sex X 12 SSI Scales), we compared satisfaction by sex on the twelve SSI scales for students with and without disabilities. The results showed that males without disabilities had significantly lower scores than females (Wilks'  $\lambda = 0.98$ ,  $F(12, 5658) = 9.63$ ,  $p < 0.001$ ), and the scale comparisons showed that the differences between the sexes was significant at  $p < .001$  for eleven of the twelve scales and at  $p < .01$  for the remaining scale. Differences ranged from 0.10 to 0.23. Although the results of the MANOVA for students with disabilities was not statistically significant, the differences between the sexes were of the same order of magnitude as those of students without disabilities (ranging from 0.09 to 0.22), and the male and female plots were similar in shape (Figure 2).

When Canadian Two-Year and Community College females were compared to males by scale, the male plots also fell below those of females on all scales, and differences ranged between 0.02 - 0.26 for the 2-year Canadian, and between 0.03 - 0.53 for the Community College comparisons (Figure 3). Despite these differences in satisfaction, it is clear from Figure 2 and Figure 3 that male and female scale scores are correlated for all groups. The Pearson correlation coefficients are shown in Table 6, and the female scores plotted against male scores are shown in Figure 4 with the regression line shown.

**Table 5. Overall Satisfaction in Dawson Diploma (DEC) Programs by Sex and Disability – With and Without the Grade Covariate**

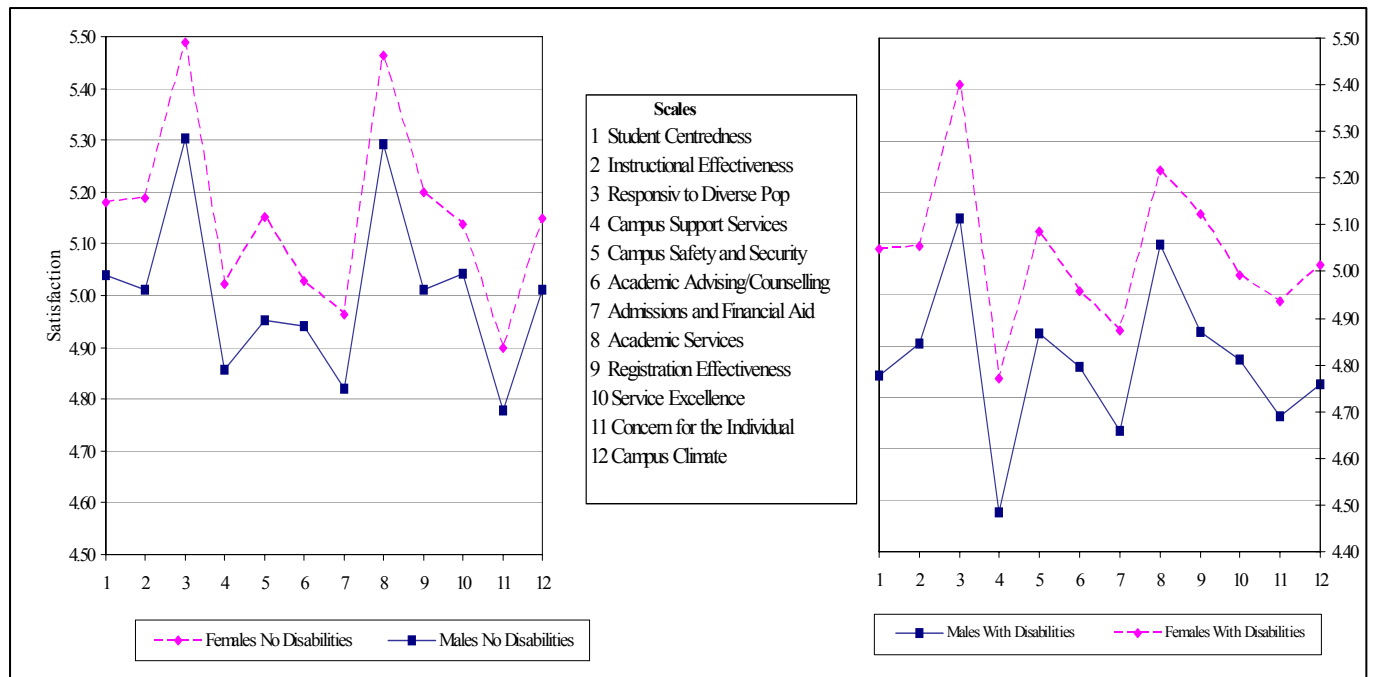
Group							Statistics						
	Females			Males			No Covariate				With Grade Covariate		
	N	Mean	SD	N	Mean	SD	Diff	F	df	sig	F	df	sig
No Disabilities	3391	5.75	1.29	2134	5.54	1.46	-0.21	32.0	1, 5523	<.001	26.58	1, 5522	<.001
With Disabilities	216	5.54	1.52	172	5.09	1.86	-0.45	6.85	1, 386	0.009	5.01	1, 385	.026
<b>Total DEC</b>	<b>3607</b>	<b>5.74</b>	<b>1.30</b>	<b>2306</b>	<b>5.50</b>	<b>1.50</b>	<b>-0.23</b>	<b>39.94</b>	<b>1, 5911</b>	<b>&lt;.001</b>	<b>32.78</b>	<b>1, 5910</b>	<b>&lt;.001</b>

**Figure 1. Male and Female Overall Satisfaction (OS) by Sex and Disability.**

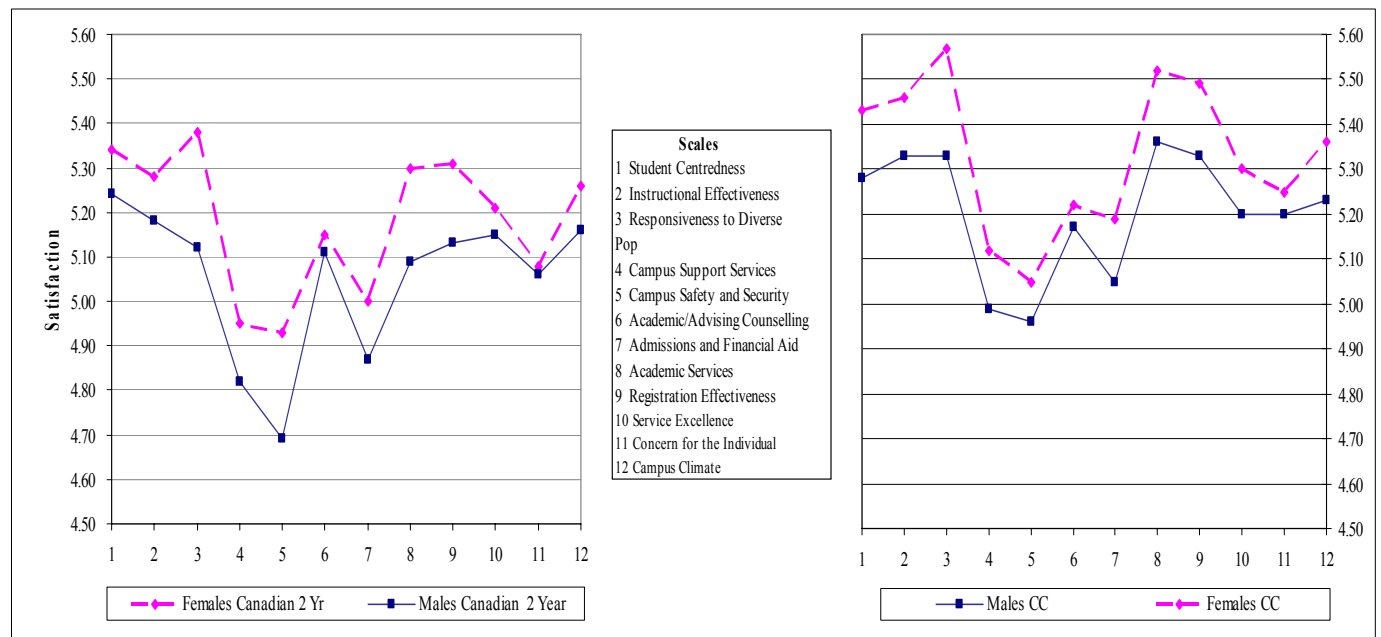




**Figure 2 Satisfaction by Scale for Dawson College Males and Females With and Without Disabilities.** (Without Disabilities. Females:  $N = 2688$ ; Males = 1710); With Disabilities (Females:  $N = 185$ ; Males = 151).



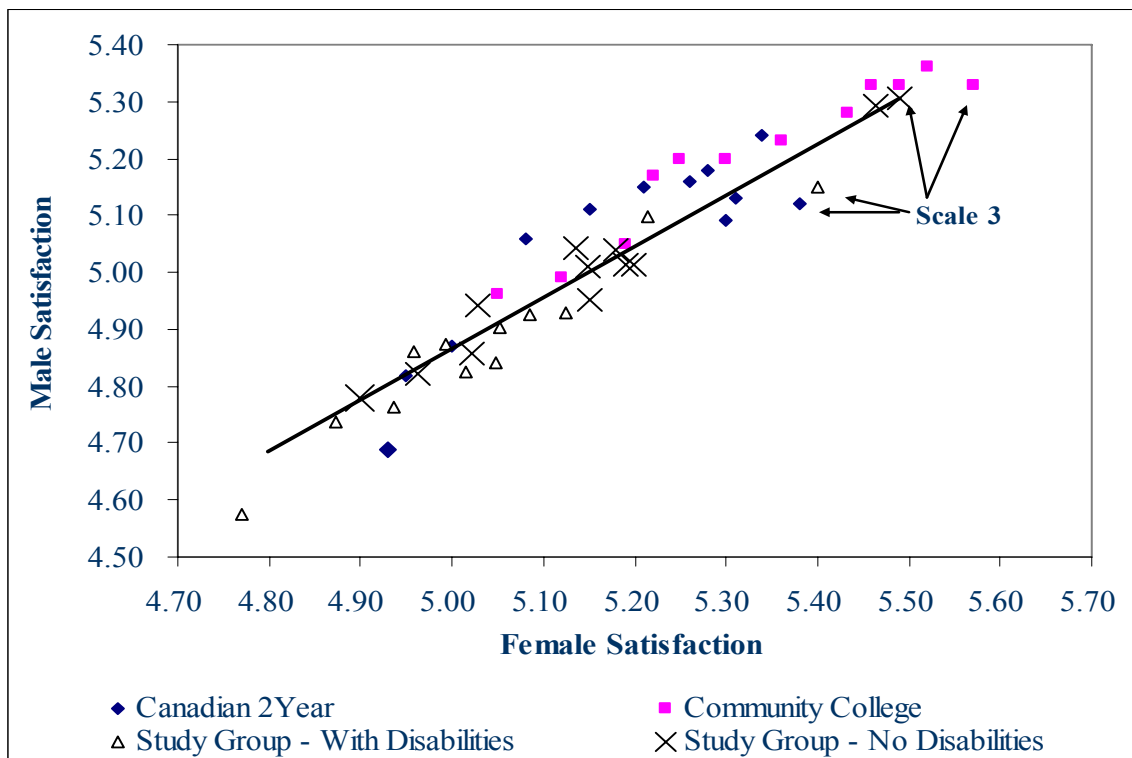
**Figure 3. Satisfaction of Canadian National and for Community College Females and Males by Scale.**



**Table 6. Pearson Correlations Between the Average Male and Female Satisfaction Scores on the Twelve SSI Scales.**

Group	N	Correlation	
		r	p
Study Group – No Disabilities	12	.982	<.001
Study Group – With Disabilities	12	.964	<.001
Community College	12	.961	<.001
Canadian Two -Year	12	.888	<.001

**Figure 4. Correlation of Male and Female SSI Scale Scores by Subgroup.**



### 4.3 Comparison of Female and Male Satisfaction by SSI Item

A total of seventy-three item satisfaction scores were compared. Because there was a wide variation in the number of responses to each of the SSI items, we did not use MANOVA with mean replacement. We, therefore, compared the differences in male and female item satisfaction scores using ANOVA. Although Bonferroni corrections should be applied to the alpha level due to multiple comparisons, because of small sample sizes for students with disabilities we considered differences to be significant wherever  $p < .05$ . However, the number of items with  $p < .001$ ,  $p < .010$  and  $p < .050$  are shown in Table 8. Differences in mean satisfaction between females and males for the four samples, for all items are provided in Appendices 4 – 7.

#### *Differences in Satisfaction by Item for Female and Male Students Without Disabilities*

Males (without disabilities) had significantly lower satisfaction scores on fifty-eight of the seventy-three items evaluated in our study sample, and forty-six of these were lower at  $p \leq .001$ . If we ignore statistical significance, a total of seventy items fell below the zero difference line when female scores were subtracted from male scores (Figure 5). As can be seen from Figure 5, Item 42 (*The equipment in the lab facilities is kept up to date*) had a larger than average difference, and may be an area of concern for males more so than for females. The item also showed an important difference between males and females with disabilities (Figure 7).

#### *Canadian Two-year and Community Colleges*

We did not have the unit record data for the Canadian Two-Year or US Community College data. However, as a difference of 0.08 was the lowest difference in item satisfaction between females and males that proved to be statistically significant in our study, we used a difference of 0.10 to approximate the number of items that were likely to be statistically significant using the larger Canadian Two-Year and US Community College samples. Since even smaller differences are expected to be statistically significant due to the larger sample sizes, this would provide a conservative estimate. On the basis of this assumption, of the seventy-three items evaluated, we estimated that at least forty-six of the Canadian Two-Year Colleges and fifty-three of the US Community Colleges items had

differences that were statistically significant, with males having lower satisfaction scores on these items. For our study sample there were no items where males had significantly higher scores than females. Only three items on the Canadian Two-Year Colleges and one item on the Community Colleges data had differences where male satisfaction scores were estimated to be significantly higher than females. Table 8 provides a summary. However, despite the differences in satisfaction between males and females, the seventy-three item scores were highly correlated for all groups (Table 7). Figure 6 plots the 73 female scores against those of males and shows a tight clustering of points around the regression line. Appendix 4 shows the female/male comparison with the probabilities for each item. Appendix 6 and Appendix 7 list the differences in item satisfaction scores between the sexes for US Community College and Canadian Two Year data respectively.

**Table 7. Pearson Correlations Between Male and Female SSI Satisfaction Item Scores.** ( $N = 73$  items).

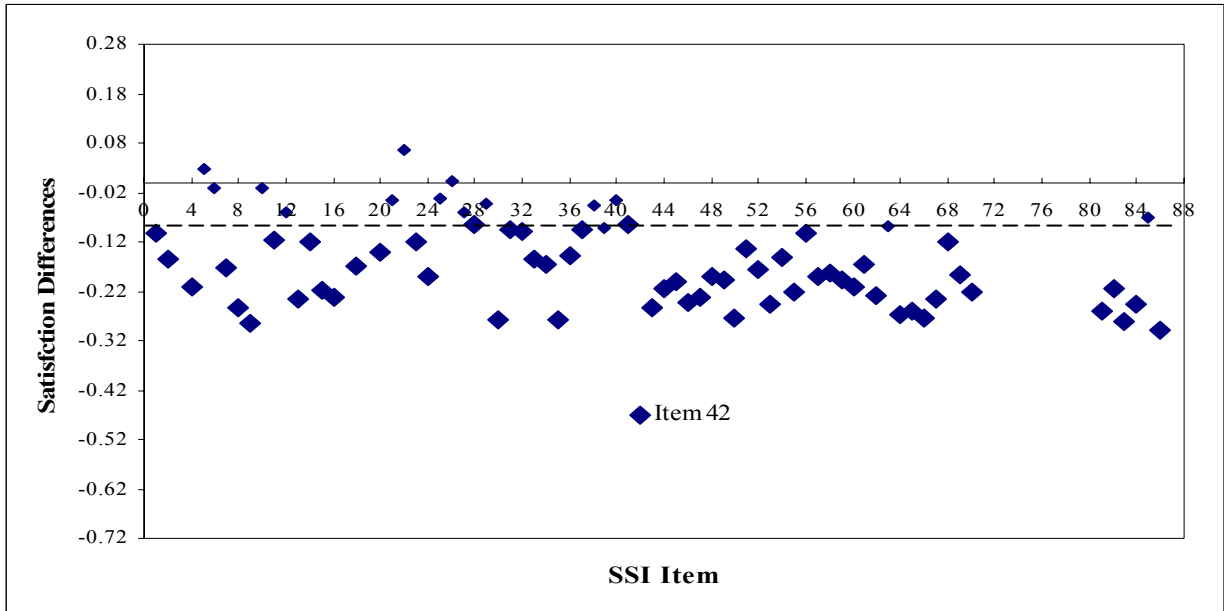
<b>Group</b>	<b>r</b>	<b>p</b>
Canadian two-year	.95	<.001
Community College	.96	<.001
Study Sample Without Disabilities	.97	<.001
Study Sample With Disabilities	.87	<.001

*Differences in Satisfaction by Item for Females and Males With Disabilities*

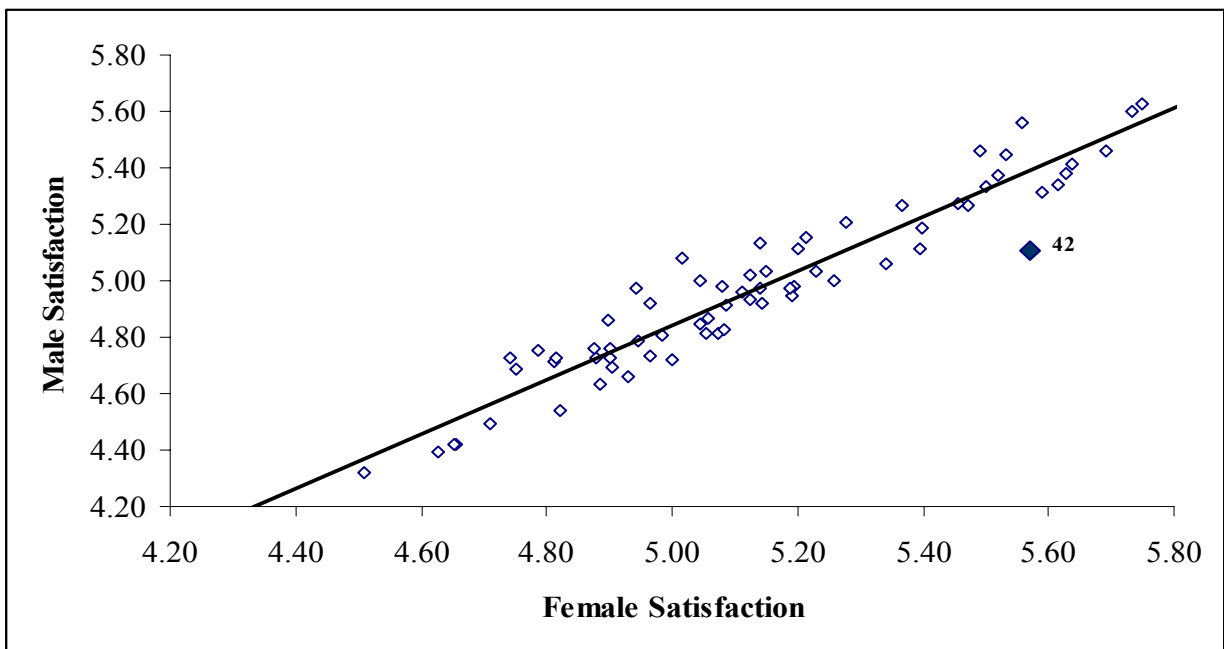
We also compared item satisfaction scores for females and males with disabilities using ANOVA. Although Bonferroni corrections should be applied to these multiple comparisons, because of the small sample size, we considered differences significant if  $p < .05$ . We found that ten of seventy-three items had statistically significant satisfaction scores that were lower for males with one having a difference of .60 and having  $p < .001$  - *Item 44 (I generally know what is happening on campus)*. Due to the smaller sample size compared to students without disabilities, a larger difference was required to show statistical significance. For example, whereas differences of .08 or greater were, for the most part, significant for students without disabilities, the smallest difference that was significant for students with disabilities was  $\pm 0.32$ . Thirty-five items had male scores that were lower than female scores by at least 0.20. Larger than average item scores between males and females with disabilities were: *Item 44 (I generally know what's happening on this*

*campus*), *Item 81 (Institution's commitment to part-time students)*, *Item 43 (Class change (drop/add) policies are reasonable)*, *Item 59 (New student orientation services help students adjust to college)*, *Item 49 (Student recruitment and admissions personnel respond to prospective students' unique needs and requests)*. Figure 7 shows the differences between the sexes and highlights items that were statistically significant. The correlation between male and female item scores was high, although not as high as for students without disabilities (Table 7). Figure 8 shows the correlation of item scores for males and females with disabilities in our sample. Appendix 5 shows the female/male comparison with the probabilities for each item.

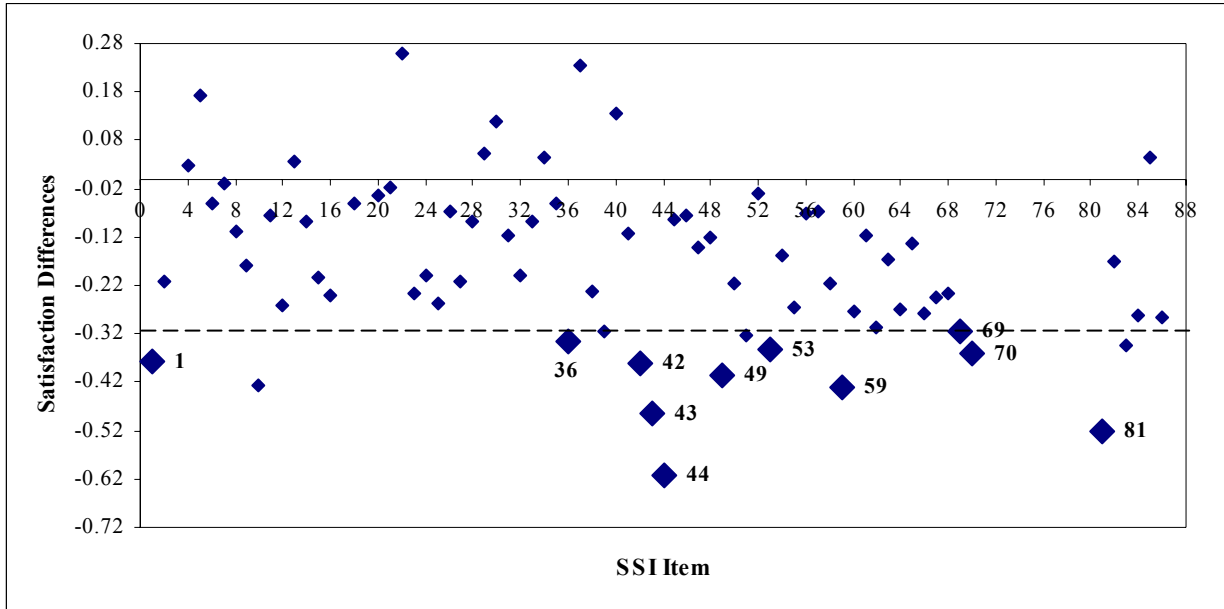
**Figure 5. Differences in Satisfaction by SSI Item Between Males and Females Without Disabilities.** (Female scores are subtracted from male scores; Items showing statistical significance are shown with larger symbols; Horizontal line is cutoff below which most items were likely to be statistically significance. Each point represents one of the 73 items evaluated).



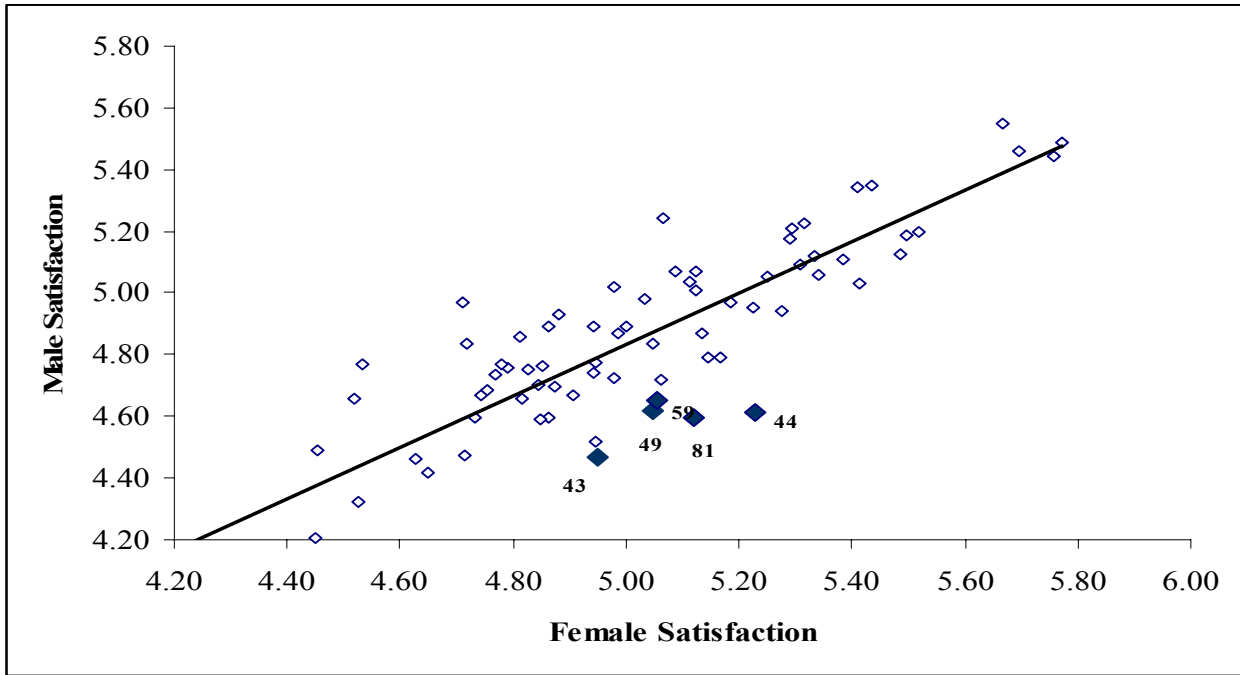
**Figure 6. Correlation: Satisfaction by SSI Item for Males and Females Without Disabilities.** (Outliers are numbered).



**Figure 7. Differences in Satisfaction by Item Between Males and Females With Disabilities.** (Female scores are subtracted from male scores; Items showing statistical significance are shown with larger symbols; Horizontal line is cutoff below which most items were likely to be statistically significant. Each point represents one of the 73 items evaluated).



**Figure 8. Male and Female Satisfaction for SSI Items – Males and Females With Disabilities Showing Outliers.** Each point represents one of the seventy-three items evaluated.



**Table 8. Summary of the Comparisons Between Male and Female Satisfaction by SSI Item and Scale** (*Male scores minus female scores; 73 items and 12 scales were evaluated; na = not available; est = estimated*).

<b>No. Items = 73</b>	<b>Items Males Lower (Sig p &lt;= .001)</b>	<b>Items Males Lower (Sig p &lt;.01)</b>	<b>Items Males Lower (Sig p &lt;.05)</b>	<b>Items Males Higher (Sig p &lt;.05)</b>	<b>Items With - 0.20 Diff or Greater</b>	<b>Highest Positive Difference</b>	<b>Highest Negative Difference</b>	<b>Average Difference</b>
Study Sample (No Disabilities)	46	6	6	0	29	0.07	-0.47	-0.16
Study Sample (With Disabilities)	1	0	9	0	35	0.26	-0.61	-0.17
Canadian Two-Year	na	na	46 (est)	3	22	0.15	-0.43	-0.15
Community College	na	na	53 (est)	1	15	0.12	-0.29	-0.14

<b>No. Scales = 12</b>	<b>Items Males Lower (Sig p &lt;= .001)</b>	<b>Items Males Lower (Sig p &lt;.01)</b>	<b>Items Males Lower (Sig p &lt;.05)</b>	<b>Items Males Higher (Sig p &lt;.05)</b>	<b>Items With - 0.20 Diff or Greater</b>	<b>Highest Positive Difference</b>	<b>Highest Negative Difference</b>	<b>Average Difference</b>
Dawson (No Disabilities)	11	1	0	0	1	na	-0.20	-0.15
Dawson (With Disabilities)	0	0	0	0	3	na	-0.25	-0.17
Canadian Two-Year	na	na	12 (est)	0	3	na	-0.26	-0.13
Community College	na	na	12 (est)	0	3	na	-0.53	-0.16

*Range of N for item comparisons: Females No Disabilities 1052 – 3437; Females With Disabilities 56 – 215; Males No Disabilities 698 - 2155; Males With Disabilities 56 – 170. (Scale comparisons: Females: No Disabilities N = 3479, With Disabilities N = 220; Males: No Disabilities N = 2192, With Disabilities N = 174).*



#### **4.4 Summary - Differences in Satisfaction by Sex**

One of our hypotheses was that females (both those with and without disabilities) would be more satisfied than their male counterparts with their college experiences. We did find that generally, males across colleges in North America had satisfaction scores that were below those of their female counterparts. These differences persisted even when we co-varied grades with satisfaction in our study sample. When the mean satisfaction on the twelve SSI survey scales was plotted by sex, although the male line fell below the female line for all scales and samples examined, males and females were more or less satisfied with the same things i.e. the peaks and troughs of satisfaction across the scales, for the most part, were the same for both sexes, and scale and item satisfaction scores were highly correlated for all groups examined. The fact that (1) male overall satisfaction fell below female satisfaction for all scales and samples tested, (2) the peaks and troughs of satisfaction on the twelve scales were similar, and (3) the average item and scale scores were highly correlated, suggests that the difference in satisfaction between the sexes may, in fact, be a reflection of a general tendency by males to score items lower than females, rather than real differences in the sexes in the areas with which they were satisfied or dissatisfied. However, the item relating to equipment in the lab facilities being current had a larger than average difference, and may be an area of concern for males more so than females for both students with and without disabilities

Larger than average differences in satisfaction were also found between males and females with disabilities with items relating to knowledge concerning what's happening on campus, the institution's commitment to part-time students, the reasonableness of class change (drop/add) policies, how new student orientation services help students adjust to college, and how student recruitment and admissions personnel respond to prospective students' unique needs and requests.

## **5 Comparing the Satisfaction of Students With and Without Disabilities**

This section of the report addresses the following hypothesis:

*Students with disabilities will express the same level of satisfaction with their college experience as those without disabilities*

Students with and without disabilities were compared on the global satisfaction variable (OS) as well as the twelve SSI scale variables.

### **5.1 Students With and Without Disabilities – Global Satisfaction**

A one way ANOVA showed students with disabilities had significantly lower scores on the OS variable compared to students without disabilities ( $F(1, 5911) = 19.81, p < .001$ ) and this was consistent across sex. The 0.45 difference in satisfaction between males with and without disabilities was statistically significant ( $F(1, 2304) = 14.10, p < .001$ ), as was the smaller difference of 0.21 between females ( $F(1, 3605) = 5.10, p = .024$ ). These differences are shown graphically in Figure 1.

### **5.2 Students With and Without Disabilities - Comparing the Twelve SSI Scale Variables**

We used MANOVA with mean replacement for the twelve scale variables to compare differences in scale means by disability for each sex. The overall MANOVA comparing students with and without disabilities was statistically significant. The separate comparisons by sex were also significant. The statistics related to the tests can be found in Table 9.

There were no statistically significant differences between students with and without disabilities on six of the twelve scales. Of the remaining six scales, one was significantly lower for males with disabilities only, one was significantly lower for females with disabilities only, and the remaining four were significantly lower for both sexes. Overall, five scale variables showed significantly lower scores for males and females with disabilities compared to their non-disabled peers.

**Table 9. Outcomes of the MANOVA Comparing Mean Differences by Disability on Twelve SSI Scale Variables**

<b>Groups Compared</b>	<b>N</b>	<b>Wilks' <math>\lambda</math></b>	<b>F</b>	<b>df</b>	<b>Sig</b>
Females With Disabilities	220	0.99	3.45	12, 3686	<.001
Females No Disabilities	3479				
Males With Disabilities	174	0.99	1.92	12, 2353	.028
Males No Disabilities	2192				
Total With Disabilities	394	0.99	4.99	12, 6052	<.001
Total No Disabilities	5671				

Table 10 shows differences in means for the twelve scales, and those scales that showed statistically significant differences for either one or both sexes. A complete listing of differences between females with and without disabilities can be found in Appendix 8, and the male comparison in Appendix 9. The largest difference between males with and without disabilities was on the *Campus Support Services* (0.27) and *Student Centeredness* (0.20) scales. For females the largest differences were for the *Academic Services* (0.25) and *Campus Support Services* (0.24) scales.

**Table 10. Satisfaction by SSI Scale, Comparing Students With and Without Disabilities.**

*(b : significant for both sexes; m : significant for males only; f : significant for females only; n : not significant for either sex).*

Scale	Scale Description	No Disabilities			With Disabilities			Statistics				
		N	M	SD	N	M	SD	Diff	df	F	Sig	
4	Campus Support Services	5671	4.96	1.17	394	4.70	1.35	-0.26	1, 6063	18.23	<.001	b
8	Academic Services	5671	5.40	0.94	394	5.17	1.10	-0.23	1, 6063	21.60	<.001	b
1	Student Centeredness	5671	5.13	1.05	394	4.96	1.19	-0.17	1, 6063	9.07	0.003	m
10	Service Excellence	5671	5.10	0.94	394	4.94	1.05	-0.16	1, 6063	10.04	0.002	b
12	Campus Climate	5671	5.10	0.94	394	4.93	1.07	-0.16	1, 6063	10.77	0.001	b
2	Instructional Effectiveness	5671	5.12	0.97	394	4.99	1.09	-0.13	1, 6063	6.72	0.010	f
3	Responsiveness to Diverse Populations	5671	5.42	1.10	394	5.32	1.32	-0.10	1, 6063	2.68	0.102	n
7	Admissions and Financial Aid	5671	4.91	1.08	394	4.82	1.14	-0.09	1, 6063	2.64	0.104	n
9	Registration Effectiveness	5671	5.13	0.98	394	5.04	1.08	-0.09	1, 6063	2.88	0.090	n
6	Academic Advising/Counseling	5671	5.00	1.18	394	4.92	1.30	-0.08	1, 6063	1.59	0.208	n
5	Safety and Security	5671	5.07	1.12	394	5.02	1.21	-0.06	1, 6063	1.00	0.318	n
11	Concern for the Individual	5671	4.85	1.13	394	4.86	1.27	0.01	1, 6063	0.01	0.909	n
<b>Average</b>			<b>5.10</b>			<b>4.97</b>		<b>-0.13</b>				

### 5.3 Summary – Satisfaction by Disability

Our hypothesis that students with disabilities will express the same level of satisfaction with their college experiences as those without disabilities was not supported, as both males and females with disabilities expressed lower levels of satisfaction than their non-disabled peers on the global satisfaction variable (OS), as well as five of the twelve scale variables. Both sexes had large differences in satisfaction compared to their non-disabled peers on the *Campus Support Services* scale. For males *Student Centeredness* and for females *Academic Services* also had differences in satisfaction that equaled or exceeded 0.20.

## 6 Disabilities, Services Registration and Satisfaction

In this section we test the following hypothesis:

*Students with disabilities who were registered for disability related services from the College will be more satisfied than either students with disabilities who were not registered, and/or students without disabilities.*

To test this hypothesis we compared students on the basis of their service registration status for the OS indicator, the twelve satisfaction scales as well as seventy-three individual satisfaction items. Consequently, the following three groups were compared by registration status for both females and males: (1) With disabilities and registered with the campus disabilities services provider; (2) With disabilities, but not registered with the campus disabilities services provider (self-reports); (3) No disabilities.

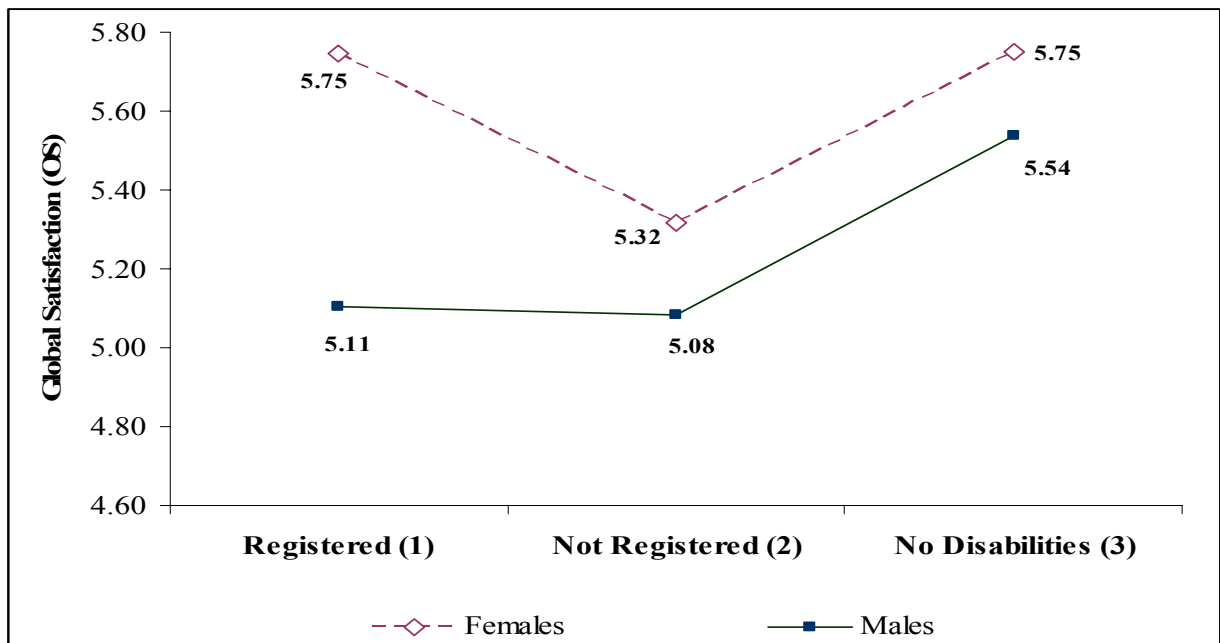
As can be seen from Table 2, approximately 50% of both males and females who registered for services had LD/ADD, whereas only 19% of unregistered females and 24% of unregistered males had this recorded as their disability. Therefore, differences between registered and unregistered students, if they do exist, may be a reflection of this difference in disability profiles between the two groups. For this reason, we also compared the satisfaction of unregistered and registered males and females by disability type.

## 6.1 Overall Satisfaction and Service Registration

A one-way ANOVA of OS by service registration was significant for both females ( $F(2, 3696) = 5.70$ ),  $p = .030$  and males ( $F(2, 2363) = 7.31$ ),  $p = .001$ . However, the post hoc comparisons showed that the result for females differed from that of males. Females who registered for disability related services were as satisfied as females without disabilities. However, females with disabilities who did not register had an OS score that was significantly lower than those of the other two groups. On the other hand, registered and unregistered males with disabilities had similar overall satisfaction scores regardless of whether they registered for disability services, while the average score of males without disabilities was significantly higher than that of both male disability groups. This can be seen in Figure 9, where the averages for the OS indicator are shown by sex and service registration.

**Figure 9. Service Registration and Overall Satisfaction (OS) by Sex.**

*1 = Registered with the disability services provider; 2 = Not registered with the disability service provider; 3 = Without disabilities. (Uses mean replacement for missing OS values).*



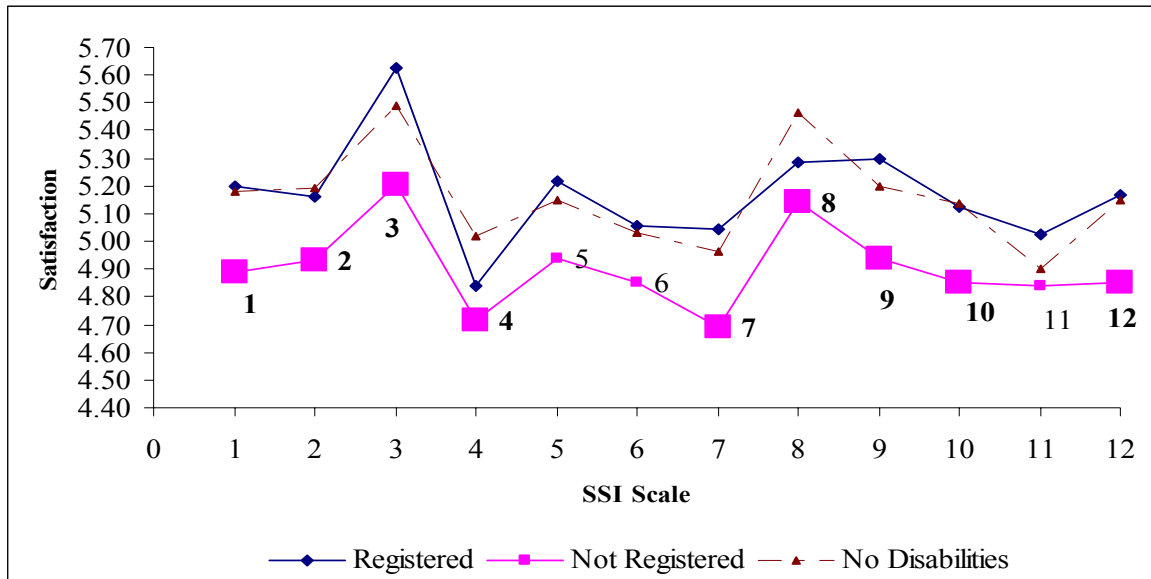
*Sample sizes: F Without disabilities,  $N = 3479$ ; F With disabilities and registered,  $N = 115$ ; F With disabilities and not registered,  $N = 105$ ; M Without disabilities,  $N = 2192$ ; M With disabilities and registered,  $N = 77$ ; M With disabilities and not registered  $N = 97$ .*

Consequently, these data seem to suggest that registration with the disability services provider may have resulted in improved overall satisfaction for females with disabilities, but not males. Both females and males with disabilities who did not register with the service provider had scores that were significantly below those of their non-disabled peers (lower by between 0.43 to 0.46). However, in order to further investigate whether there were differences between males and females depending on whether they registered for disability related services on campus, we also compared the groups on the basis of the twelve satisfaction scales and individual items scores.

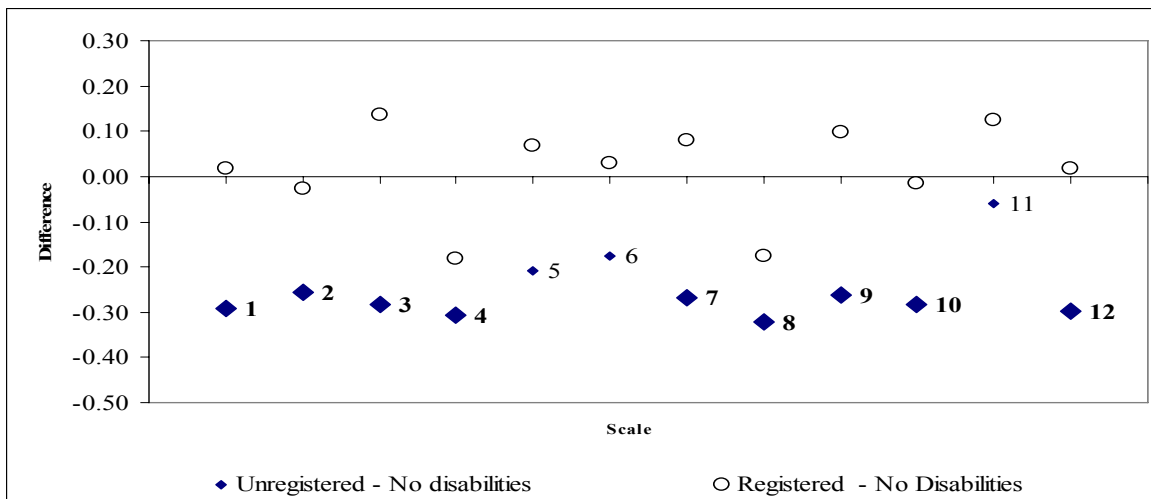
## **6.2 Satisfaction by SSI Scale and Disability Services Registration – Comparison to Students Without Disabilities**

We compared the average satisfaction scores by scale and service registration for males and females using MANOVA with mean replacement (12 Satisfaction scales X 3 Services registration). The test was significant for both males (Wilks'  $\lambda = 0.99$ ,  $F(24, 4704) = 1.53$ ,  $p = 0.047$ ) and females (Wilks'  $\lambda = 0.98$ ,  $F(24, 7370) = 2.61$ ,  $p < .001$ ). The post-hoc tests (Tukey HSD) showed that there were no significant differences in satisfaction on any of the scales between students without disabilities, and students with disabilities who registered with the campus disability services provider, and this was true for both females and males. However, when the mean satisfaction between students with disabilities who did not register with the service provider and those without disabilities were compared, there were significant differences for nine of the twelve scales for females (Figure 10 and Figure 11) and six of the twelve scales for males (Figure 12 and Figure 13), with both unregistered males and females with disabilities having lower satisfaction on these scales.

**Figure 10. Satisfaction by SSI Scale Comparing Females Who Registered for Disability Services with Those Who Did Not Register.** (Scales where the differences in satisfaction between unregistered females and females without disabilities were statistically significant ( $p < .05$ ) are highlighted using larger symbols and scale numbers are shown in bold;  $N = 12$  scales).



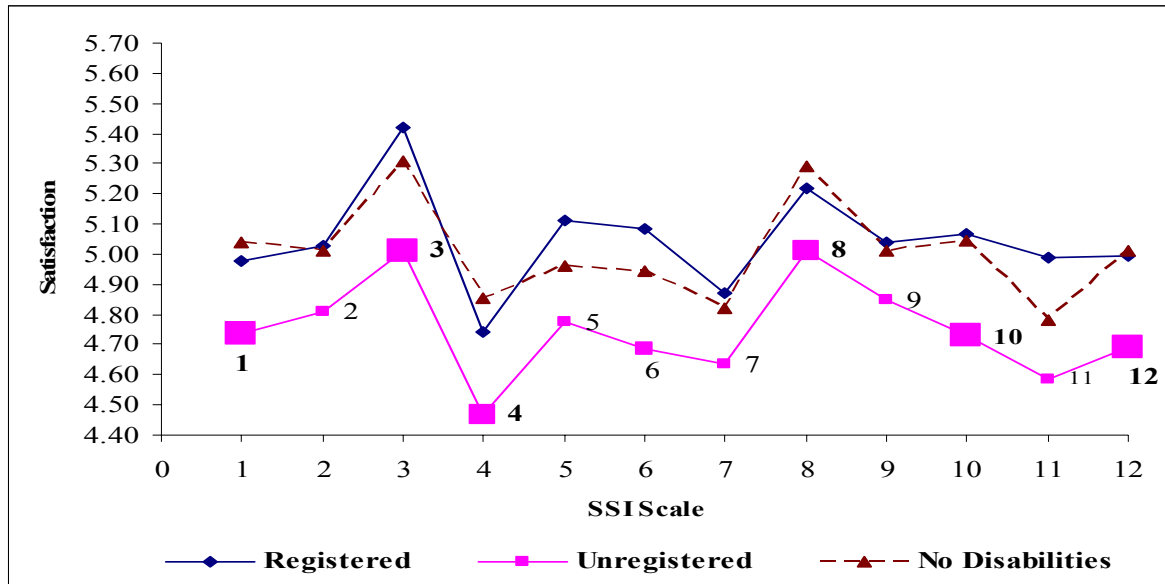
**Figure 11. Differences in Satisfaction Between 1) Unregistered Females With Disabilities and Females with No Disabilities and 2) Registered Females With Disabilities and Females with No Disabilities.** (Scales where the differences in satisfaction between unregistered females and females without disabilities were statistically significant ( $p < .05$ ) are highlighted using larger symbols and scale numbers are shown in bold;  $N = 12$  scales).



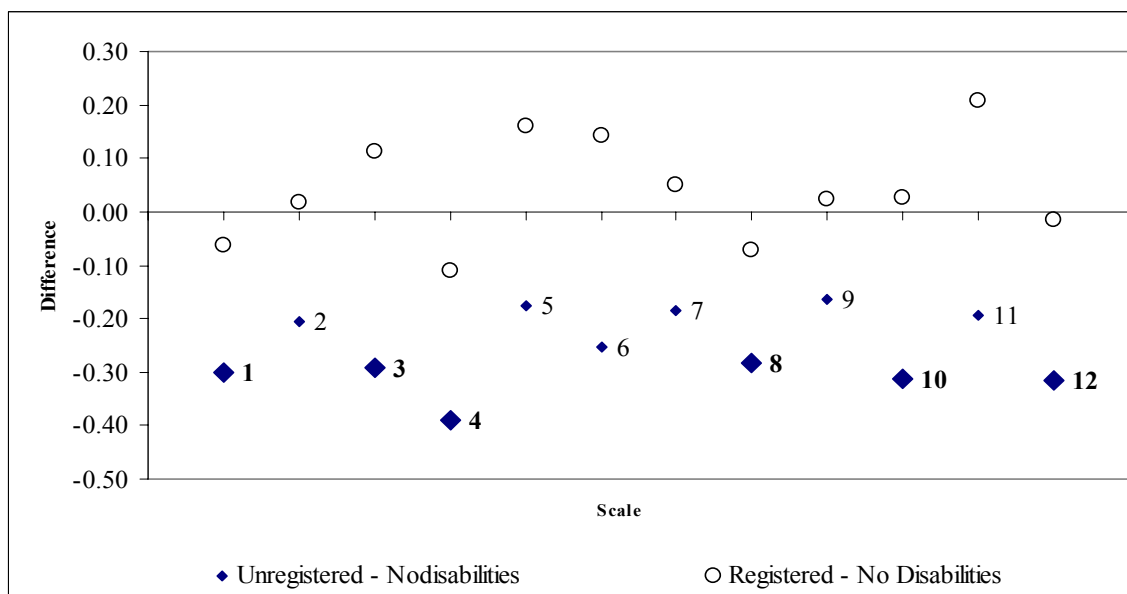
Scales showing significant differences: 1. Student Centeredness; 2. Instructional Effectiveness; 3. Responsiveness to Diverse Populations; 4. Campus Support Services; 7. Admissions and Financial Aid; 8. Academic Services; 9. Registration Effectiveness; 10. Service Excellence; 12. Campus Climate.



**Figure 12. Differences in Satisfaction Between Males Who Registered for Services and Those Who Did Not Register.** (Scales where the differences in satisfaction between unregistered males and males without disabilities were statistically significant ( $p < .05$ ) are highlighted using larger symbols and scale numbers are shown in bold;  $N = 12$  scales).



**Figure 13. Differences in Satisfaction Between 1) Unregistered Males With Disabilities and Males With No Disabilities 2) Registered Males With Disabilities and Males With No Disabilities** (Scales where differences between unregistered males and males without disabilities were statistically significant ( $p < .05$ ) are highlighted using larger symbols, and scale numbers are shown in bold;  $N = 12$  scales).



Scales showing significant differences: 1. Student Centeredness; 3. Responsiveness to Diverse Populations; 4. Campus Support Services; 8. Academic Services; 10 Service Excellence; 12 Campus Climate.

For the scales that were not significantly different, unregistered students had lower scores than either registered students or students without disabilities. In other words, both males and females with disabilities who registered for campus-based disability services were as satisfied as their non-disabled peers, while males and females with disabilities who did not register with the disability services provider were less satisfied with many aspects of their college experience. The six scales that showed significant differences for males, were also among the nine that were significant for females. These differences in satisfaction between registered and unregistered students persisted even when grades (CRCM) were used as a covariate.

### **6.3 Comparison of Registered and Unregistered Students With Disabilities by SSI Scale**

When a direct comparison was done between students who did and those who did not register for disability services, four of the twelve scales had significant differences at  $p < .05$  for females and none were significant for males at  $p < .05$ , even though the magnitude of the differences were similar to those of females. Differences of the same order of magnitude as that for females tended to have a  $p$  value  $< .10$  for males. For this reason we chose  $p < .10$  to judge the significance of the differences in means between registered and unregistered students on the twelve scales. Table 11 shows the differences in means between registered and unregistered males and females and the associated  $p$  values.

The largest difference between registered and unregistered students for both sexes was on the *Responsiveness to Diverse Populations* scale. Females who registered for services had significantly higher levels of satisfaction ( $p < .10$ ) on the *Student Centeredness*, *Responsiveness to Diverse Populations*, *Admissions and Financial Aid*, *Registration Effectiveness*, *Service Excellence* and *Campus Climate* scales.

**Table 11. Differences in Satisfaction Between Unregistered and Registered Females and Males With Disabilities.** (Shaded items represent the scales that showed statistically significant differences in scale means when the satisfaction scores for registered students were subtracted from those of unregistered students at  $p < .10$ ).

Scale	Females			Males		
	Rank	Diff	p	Rank	Diff	p
1 Student Centeredness	5	-0.31	.07	8	-0.24	.32
2 Instructional Effectiveness	8	-0.23	.18	10	-0.22	.32
3 Responsiveness to Diverse Populations	1	-0.42	.01	1	-0.41	.06
4 Campus Support Services	12	-0.13	.70	7	-0.28	.28
5 Safety and Security	6	-0.28	.15	5	-0.34	.14
6 Academic Advising/Counseling	9	-0.21	.40	2	-0.40	.08
7 Admissions and Financial Aid	2	-0.35	.04	8	-0.24	.34
8 Academic Services	11	-0.15	.47	11	-0.21	.35
9 Registration Effectiveness	3	-0.36	.01	12	-0.19	.44
10 Service Excellence	7	-0.27	.08	4	-0.34	.06
11 Concern for the Individual	10	-0.19	.44	2	-0.40	.06
12 Campus Climate	4	-0.32	.03	6	-0.30	.11

Females registered for services:  $N = 115$ ; Females not registered for services:  $N = 105$ ; Females No Disabilities:  $N = 3479$ . Males registered for Services:  $N = 77$ ; Males not registered for services:  $N = 97$ ; Males No Disabilities:  $N = 2192$ .

On the other hand, males who registered for services had higher levels of satisfaction ( $p < .10$ ) on the *Responsiveness to Diverse Populations*, *Academic Advising/Counseling*, *Concern for the Individual* and *Service Excellence* scales.

#### 6.4 Differences in Satisfaction by SSI Item and Service Registration

For the seventy-three items compared we did not use mean replacement as there were many items where there were missing values for 10% or more of survey respondents. This meant we could not use MANOVA as the analysis would have eliminated too many students from

the sample. Instead we used a series of ANOVA's for each item (Item Satisfaction X 3 Service Registration) to compare differences in satisfaction means among groups. A list of the numbered items included in the analysis can be found in Appendix 1, and these numbers are used to highlight the items that showed differences. Bonferroni corrections would normally be applied to the alpha level due to multiple comparisons, which would mean that only items with  $p < .001$  would be significant. Because of the small sample sizes for students with disabilities, we considered differences to be significant at  $p < .05$  in order not to miss important differences. However, all items deemed significant are shown with their associated p levels.

#### 6.4.1 Female Satisfaction by SSI Item

The outcomes of the ANOVAs for females for the seventy-three items we compared are shown in Table 12. As already mentioned, although Bonferroni corrections should be applied to the alpha level due to multiple comparisons, because of small sample sizes for students with disabilities we considered differences to be significant at  $p < .05$ . However, the number of items with  $p < .001$ ,  $p < .010$  and  $p < .050$  are shown in Table 12.

**Table 12. Females - Registration With the Campus Based Disability Service Provider and Satisfaction – Item Breakdown.**

Comparisons	Sig Lower	Sig Higher	Not Sig	Total Items	Sig p < .05	Sig p < .01	Sig p < .001	Total Sig	Total Lower	Total Higher
Unregistered - Registered	14	0	59	73	10	3	1	14	63	10
Unregistered - No Disabilities	16	0	57	73	7	7	2	16	71	2
Registered - No Disabilities	2	3	68	73	4	1	0	5	43	30

#### *Registered Females and Females Without Disabilities*

When females who were registered with the service provider were compared to females without disabilities, two of the items were significantly lower and three significantly higher than the corresponding items for their non-disabled peers. For the remaining 68 items there were no significant differences. If we ignore significances, a total of 30 items had higher and 43 lower satisfaction for the registered females compared to females without

disabilities (Table 12). Items where satisfaction was significantly higher are highlighted in Figure 14, and were as follows: *The personnel involved in registration are helpful (Item 5,  $p < .05$ ); Classes are scheduled at times that are convenient for me (Item 8,  $p < .05$ ), I am able to register for classes I need with few conflicts (Item 15,  $p < .05$ )*. Items with lower satisfaction were *Library resources and services are adequate (Item 14,  $p < .01$ ) and Policies and procedures regarding registration and course selection are clear and well-publicized (Item 35,  $p < .001$ )*.

#### *Unregistered Females and Females Without Disabilities*

When females who were not registered with the service provider were compared to their non-disabled peers, there were sixteen items where satisfaction was significantly lower and none of the items had substantially higher satisfaction. However, if we ignore significance, a total of seventy-one items had satisfaction scores that were lower for unregistered females, with only two items having higher satisfaction (Table 12). Figure 15 plots the seventy-three differences, and highlights the sixteen that were statistically significant using the criteria  $p < .05$ . These items are listed in Table 13. The two items that were significant at  $<.001$  were *Item 21 (There are a sufficient number of study areas available)* and *Item 65 (Students are notified early in the term if they are doing poorly in a class)*.

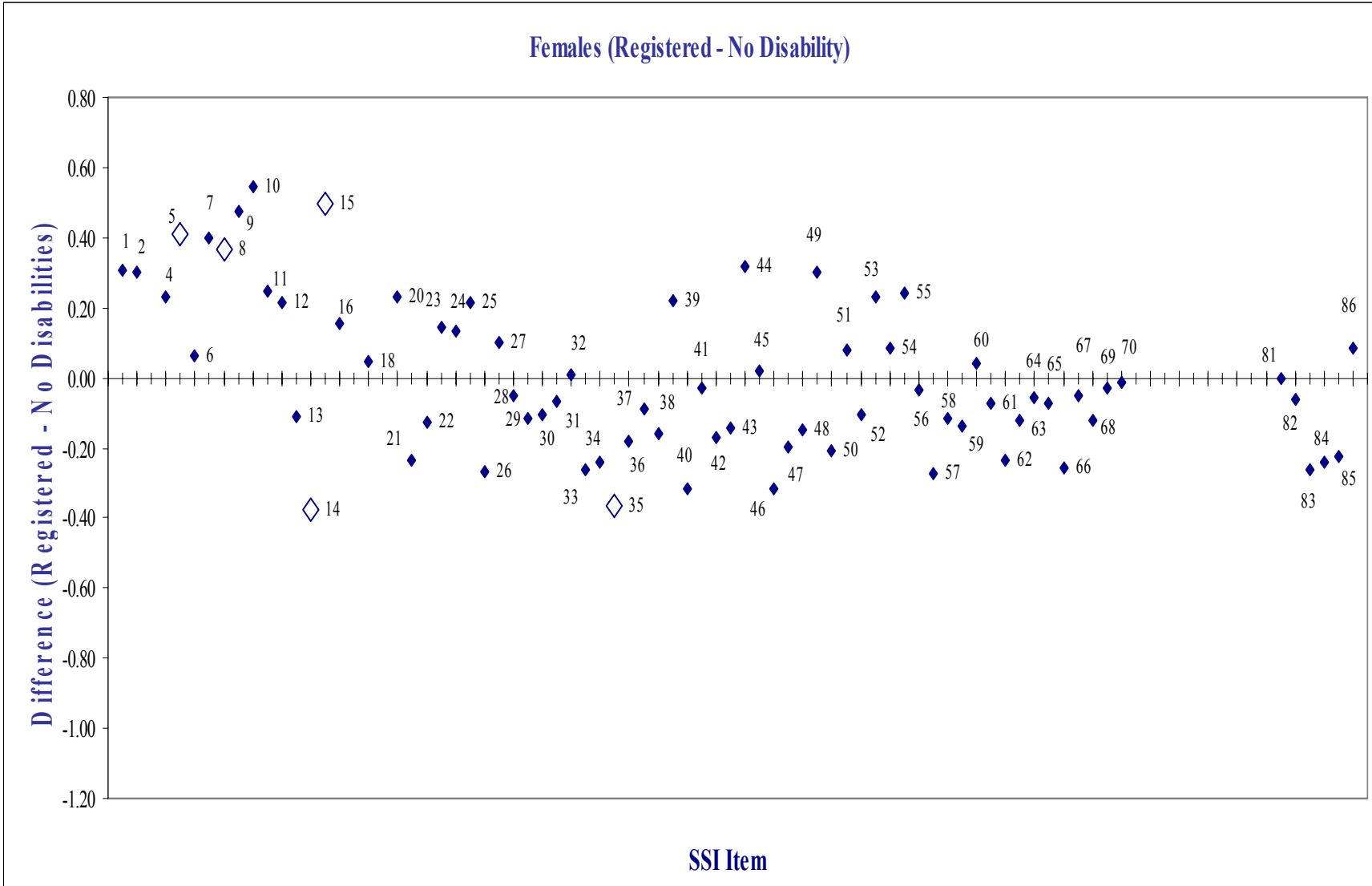
#### *Unregistered and Registered Females With Disabilities*

It is also interesting to compare unregistered to registered females, as it is this comparison that is most likely to be a direct reflection of the benefits accrued to students who register with the disability services provider. Using the  $p < .05$  cutoff, this comparison resulted in fourteen items with a significant difference in satisfaction that was lower for unregistered females, and none that were higher. The fourteen items showing differences are listed in Table 13. If we ignore statistical significance, a total of sixty-three of the seventy-three items evaluated registered lower mean satisfaction for unregistered females. Figure 16 plots the differences in satisfaction between registered and unregistered females for all seventy-three items, and highlights the fourteen that were statistically significant.

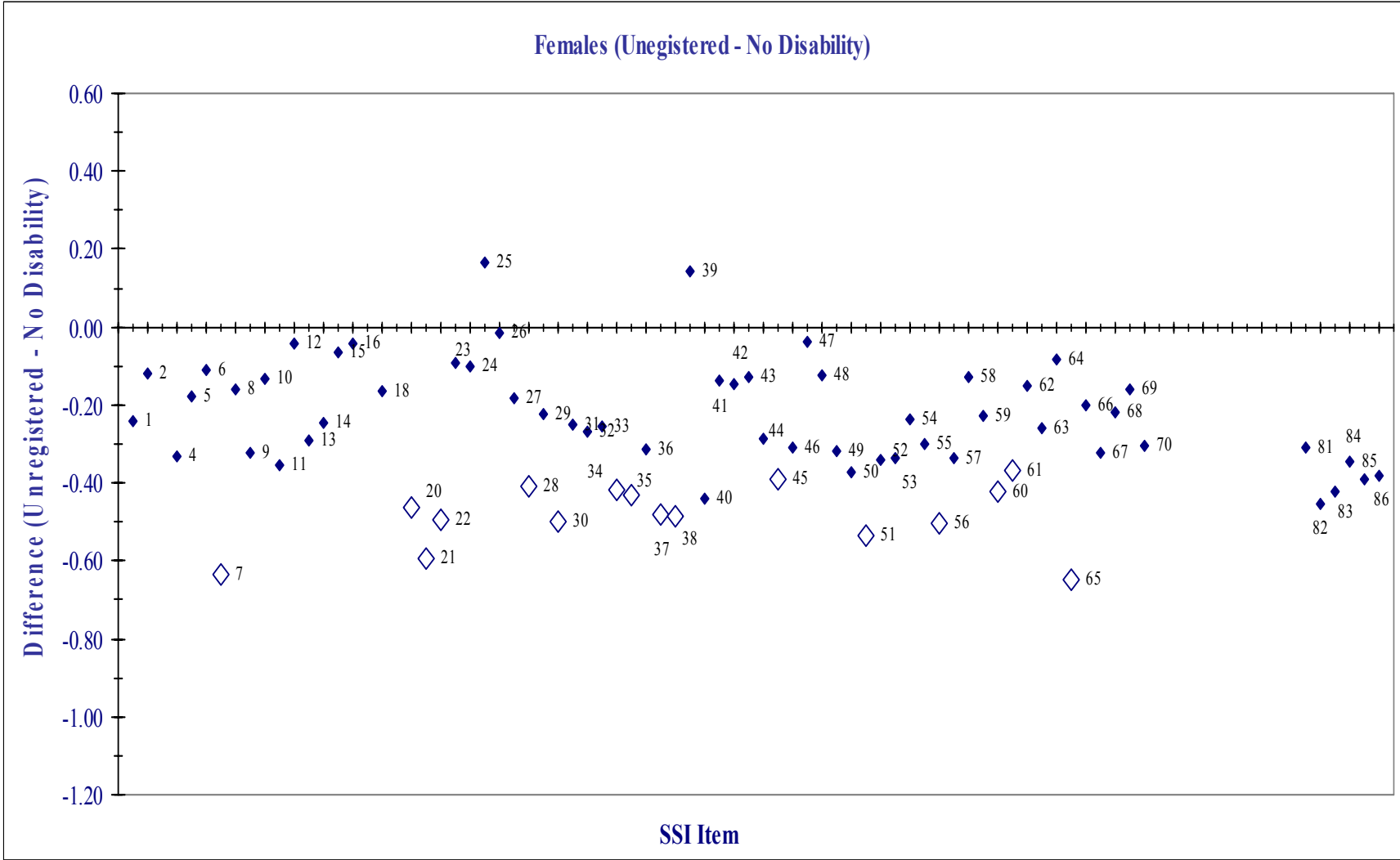
**Table 13. SSI Items That Were Significantly Lower for Females Who Did Not Register With the Disability Service Provider, Compared to a) Females Without Disabilities and b) Registered Females.** ( $\sqrt{\phantom{x}}$   $p < .05$ ;  $\sqrt{\sqrt{\phantom{x}}}$   $p < .01$ ;  $\sqrt{\sqrt{\sqrt{\phantom{x}}}}$   $p < .001$ ). *Shaded items were also significant in the male comparison.*

Item Description	(a) Females No Disabilities (16 items)	(b) Registered Females (14 Items)
1 Most students feel a sense of belonging here.		√
4 Security staff are helpful.		√
5 The personnel involved in registration are helpful.		√
7 Adequate financial aid is available for most students at this institution.	√√	√√√
8 Classes are scheduled at times that are convenient for me.		√
9 Internships/work study or practical experiences are provided in my diploma program.		√
11 Security staff respond quickly in emergencies.		√
20 Student awards/financial aid staff are helpful.	√	√
21 There are a sufficient number of study areas available.	√√√	
22 People on this campus respect and are supportive of each other.	√√	
28 It is an enjoyable experience to be a student on this campus.	√	
30 The career/placement services office provides students with the help they need to get a job.	√	
34 Computer labs are adequate and accessible.	√	
35 Policies and procedures regarding registration and course selection are clear and well-publicized.	√	
37 Faculty take into consideration student differences as they teach a course.	√√	
38 The student centre/lounge areas are comfortable places for students to spend their leisure time.	√√	
44 I generally know what's happening on this campus.		√√
45 This institution has a good reputation within the community.	√	
49 Student recruitment and admissions personnel respond to prospective students' unique needs and requests.		√√
51 There are convenient ways of paying my tuition/registration and other institutional fees.	√√	√√
53 The assessment and course placement/equivalence granting procedures are reasonable.		√
55 Student success/academic support services adequately meet the needs of students.		√
56 The business/administration office is open during hours which are convenient for most students.	√√	
60 Billing policies are reasonable.	√	
61 Faculty are usually available after class and during office hours.	√√	
65 Students are notified early in the term if they are doing poorly in a class.	√√√	√

**Figure 14. Differences in SSI Item Satisfaction Between Females Who Registered With the Disability Services Provider and Females Without Disabilities.** (Statistically significant items are shown with larger, un-shaded symbols).

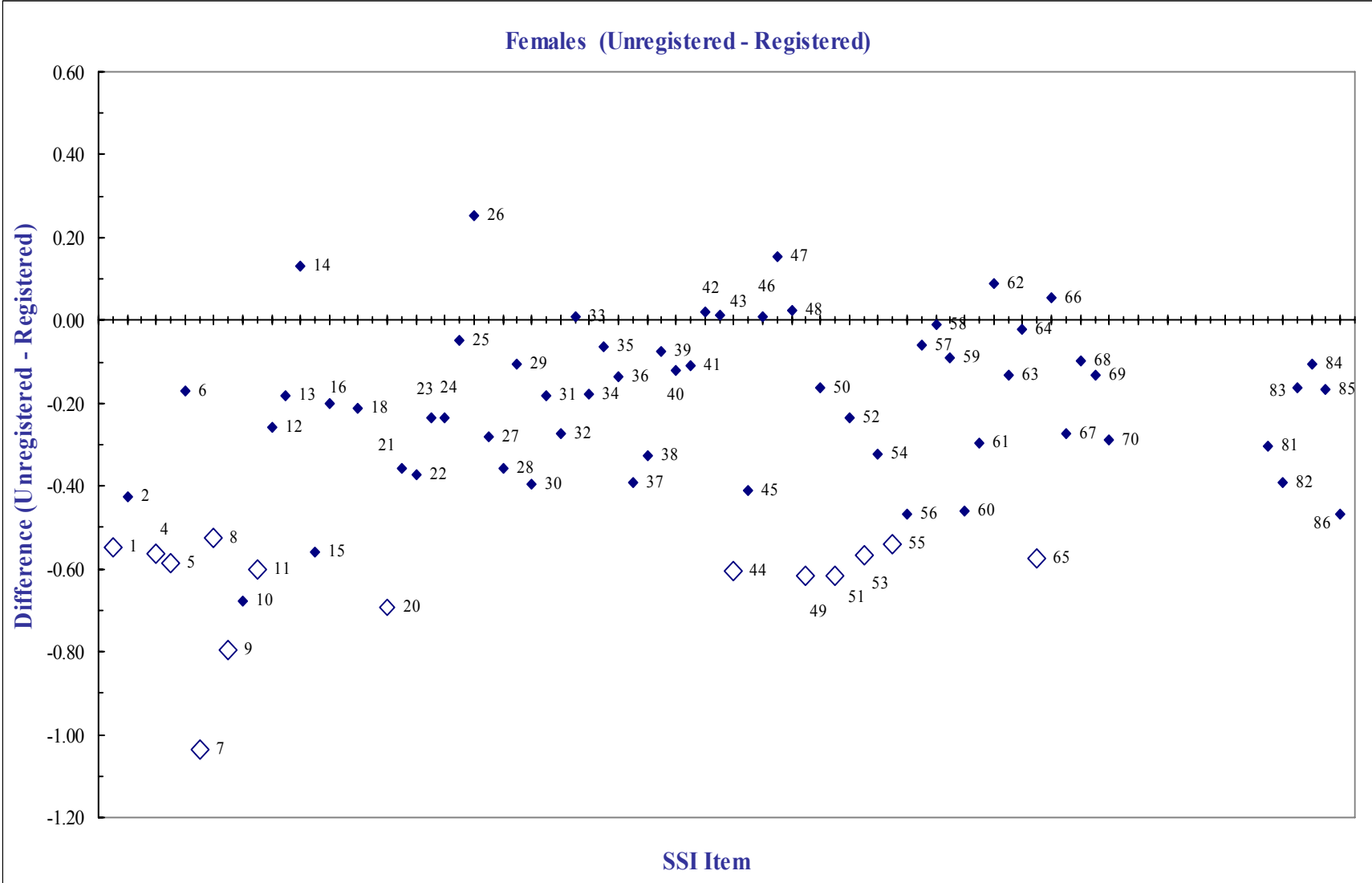


**Figure 15. Differences in SSI Item Satisfaction Between Females Who Did Not Register With the Disability Services Provider and Females Without Disabilities.** (Statistically significant items are shown with larger, un-shaded symbols).





**Figure 16. Differences in SSI Item Satisfaction Between Females Who Did Not Register With the Disability Services Provider and Females Who Did Register.** (Statistically significant items are shown with larger, un-shaded symbols).



### 6.4.2 Male Satisfaction by SSI Item

The outcomes of the ANOVAs for males on the seventy-three items compared by service registration are shown in Table 14.

**Table 14. Number of SSI Items Showing Lower and Higher Averages Comparing Males by Disability Services Registration.**

Comparison Males	Sig Lower	Sig Higher	Not Sig	Total Items	Sig p < .05	Sig p < .01	Sig p < .001	Total Sig	Total Lower	Total Higher
Unregistered - Registered	8	0	65	73	7	1	0	8	66	7
Unregistered - No Disabilities	15	0	58	73	8	5	2	15	68	5
Registered - No Disabilities	1	2	70	73	3	0	0	3	32	41

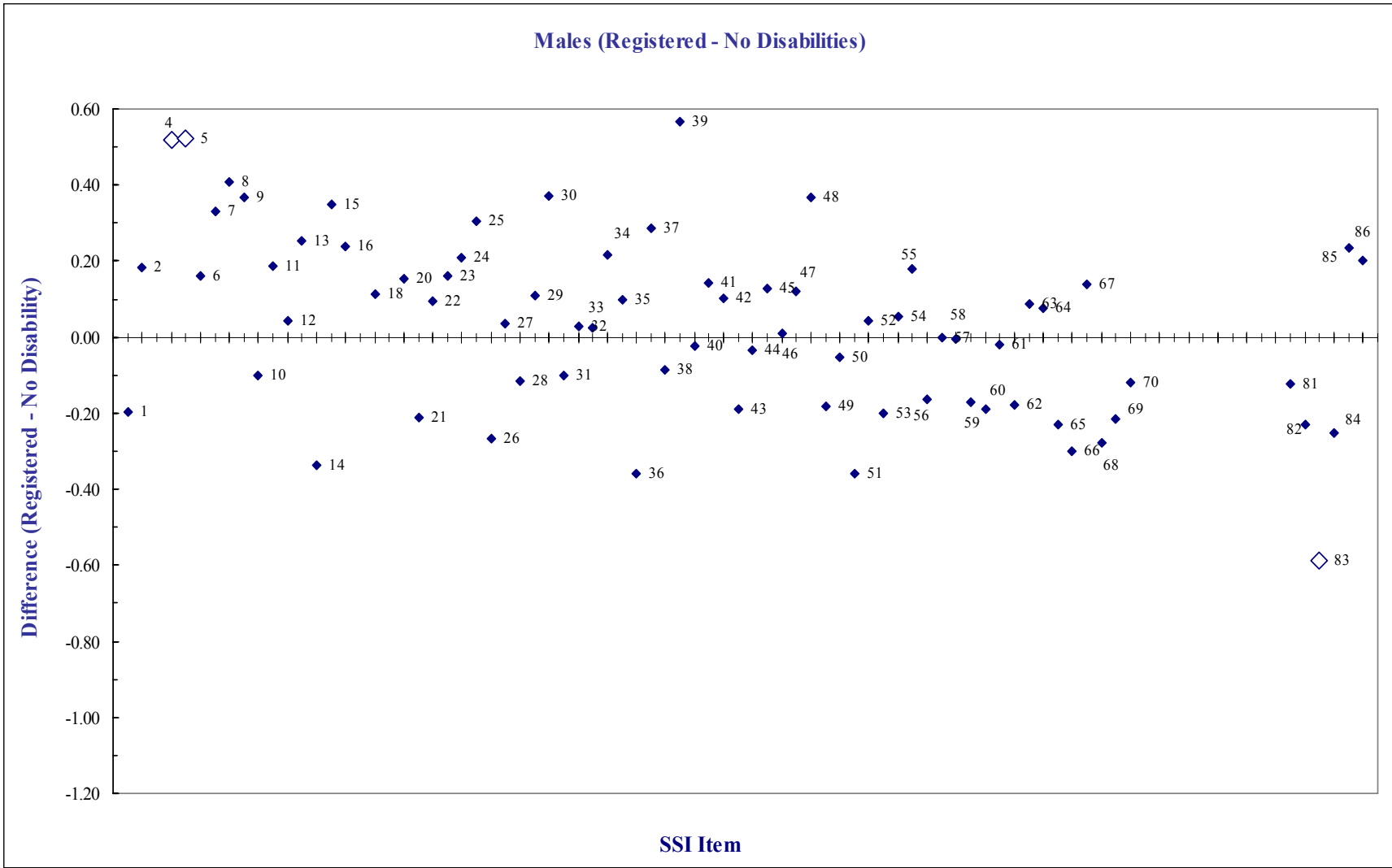
#### *Registered Males and Males Without Disabilities*

Again we used  $p < .05$  as the cutoff for the level of significance, despite multiple comparisons, but indicate the p levels for relevant items. When males who were registered for services were compared to males without disabilities, one of the satisfaction items was significantly lower and two significantly higher than the corresponding items for their non-disabled peers. For the remainder of the seventy-three items there were no significant differences (Table 14). If we ignore statistical significances, a total of forty-one items were higher and thirty-two lower for the registered males (Figure 17). Items where satisfaction was significantly higher for registered males were *The personnel involved in registration are helpful (Item 5)*, as was the case for registered females, and *Security staff are helpful (Item 11)*. The one item with significantly lower satisfaction, and this item was also lower in the female comparison, was, *Library resources and services are adequate (Item 14)*.

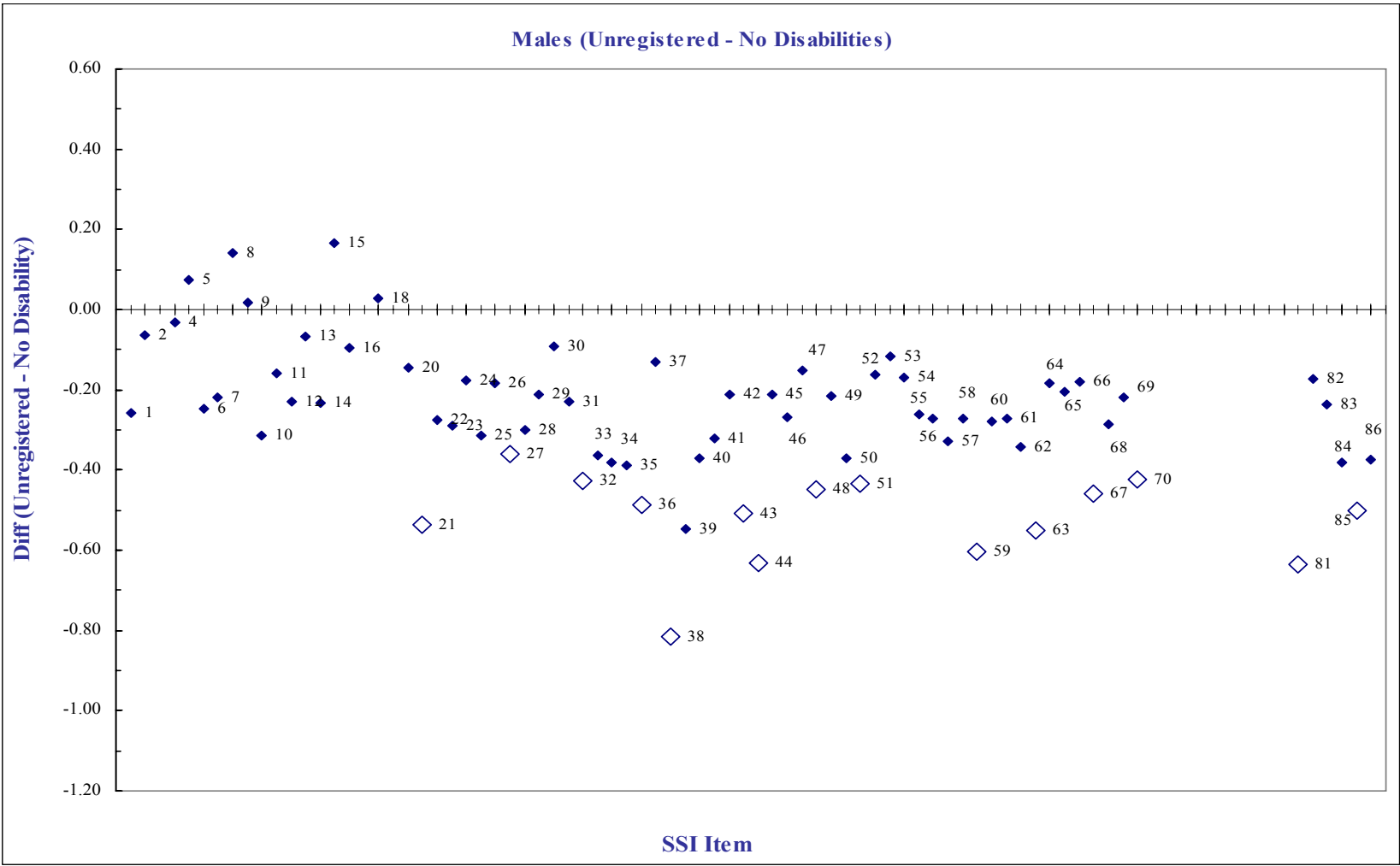
#### *Unregistered Males and Males Without Disabilities*

When males who were not registered for disability services were compared to their non-disabled peers, fifteen of the seventy-three satisfaction items were significantly lower and none were significantly higher. Figure 18 plots the seventy-three differences, and highlights the fifteen that were significant using the  $p < .05$  cutoff. These are listed in Table 15 with the associated probabilities.

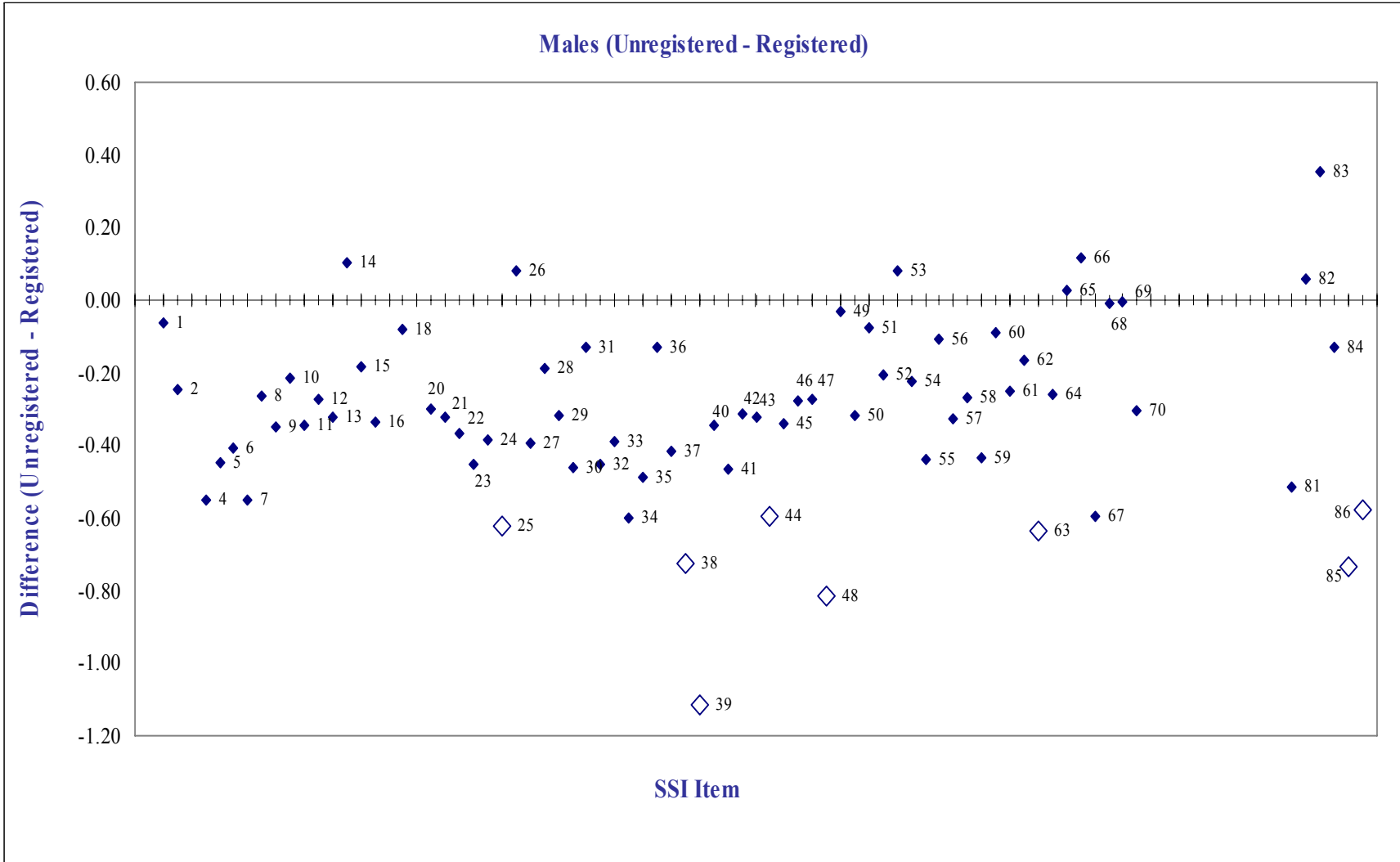
**Figure 17. Differences in SSI Item Satisfaction Between Males Who Registered With the Disability Services Provider and Males Without Disabilities.** (Statistically significant items are shown with larger, un-shaded symbols).



**Figure 18. Differences in SSI Item Satisfaction Between Males Who Did Not Register With the Disability Services Provider and Males Without Disabilities.** (Statistically significant items are shown with larger, un-shaded symbols).



**Figure 19. Differences in SSI Item Satisfaction Between Males Who Did Not Register With The Disability Services Provider and Males Who Did Register.** (Statistically significant items are shown with larger, un-shaded symbols).



However, if we ignore statistical significance, a total of sixty-eight items were lower for unregistered males and only five were higher (Table 14).

**Table 15. SSI Items With Satisfaction Scores Lower for Males With Disabilities Who Did Not Register With the Disability Services Provider Compared to a) Males With No Disabilities and b) Males Who Did Register** ( $\sqrt{\quad}$  p < .05;  $\sqrt{\sqrt{\quad}}$  p < .01;  $\sqrt{\sqrt{\sqrt{\quad}}}$  p < .001).  
(Shaded items were also significant in the female comparison).

SSI Item	Comparison Group	
	(a) Males No Disabilities (15 items)	(b) Registered Males (8 items)
21 There are a sufficient number of study areas available.	$\sqrt{\sqrt{\quad}}$	
25 Academic advisors/counsellors are concerned about my success as an individual.		$\sqrt{\quad}$
27 The campus staff are caring and helpful.	$\sqrt{\quad}$	
32 Academic advisor/counsellors are knowledgeable about my program requirements.	$\sqrt{\quad}$	
36 Students are made to feel welcome on this campus.	$\sqrt{\sqrt{\quad}}$	
38 The student centre/lounge areas are comfortable places for students to spend their leisure time.	$\sqrt{\sqrt{\sqrt{\quad}}}$	$\sqrt{\quad}$
39 The amount of student parking space is adequate.		$\sqrt{\quad}$
43 Class change (drop/add) policies are reasonable.	$\sqrt{\quad}$	
44 I generally know what's happening on this campus.	$\sqrt{\quad}$	$\sqrt{\quad}$
48 Personal counselling staff care about students as individuals.	$\sqrt{\sqrt{\sqrt{\quad}}}$	$\sqrt{\quad}$
51 There are convenient ways of paying my tuition/registration and other institutional fees.	$\sqrt{\quad}$	
59 New student orientation services help students adjust to college.	$\sqrt{\sqrt{\quad}}$	
63 I seldom get the "run-around" when seeking information on this campus.	$\sqrt{\sqrt{\quad}}$	$\sqrt{\quad}$
67 Channels for expressing student complaints are readily available.	$\sqrt{\quad}$	
70 I am able to experience intellectual growth here.	$\sqrt{\quad}$	
81 Commitment to: Part-time students?	$\sqrt{\sqrt{\quad}}$	
85 Commitment to: Commuters?	$\sqrt{\quad}$	$\sqrt{\quad}$
86 Commitment to: Students with special needs?		$\sqrt{\quad}$

### *Unregistered and Registered Males With Disabilities*

A direct comparison of registered and unregistered males resulted in eight items that were statistically significant, with lower satisfaction for unregistered males (Table 15), and none that were higher. If we ignore statistical significance a total of sixty-eight items had lower mean satisfaction for unregistered males (Table 15). Figure 19 plots the differences in satisfaction between registered and unregistered males, and highlights the eight that were significant using  $p < .05$  as the cutoff. Only *Item 44 (I generally know what's happening on this campus)* was common to the female comparison.

## **6.5 Summary Students With and Without Disabilities, Satisfaction and Service Registration**

Compared to students without disabilities, students with disabilities had lower satisfaction on many items, and this was consistent across sex. However, students who registered with the disability services provider showed improved satisfaction on many items and scales compared to unregistered students, and this was true for both sexes. Where differences in item satisfaction between registered and unregistered students were significant using  $p < .05$  as the cutoff, items tended to differ by sex with some exceptions. Consequently, our hypothesis that students with disabilities who were registered for disability related services from the College would be more satisfied than either students with disabilities who were not registered, and/or students without disabilities was only partially supported. Females who registered with the College's disability services provider had item satisfaction scores that were either equivalent to females without disabilities, or in some cases higher. Females with disabilities who did not register had satisfaction scores that were significantly lower in many areas. This is consistent with our findings on the overall satisfaction variable, which showed registered females to be as satisfied as their non-disabled peers and to be more satisfied than unregistered females.

Males who registered also showed similarities in a number of areas with males who did not register, and on some items the satisfaction was higher than that of their non-disabled peers. This was not consistent with the findings with respect to the OS variable, as this

showed that both registered and unregistered males were less satisfied than their non-disabled peers.

However, as there was a much higher proportion of students with LD/ADD who registered with the service provider than those who self-reported LD/ADD as their disability, this may have had an impact on our findings. We examine these differences by comparing students with LD/ADD to students with a disability other than LD/ADD in the following section.

## **7 Differences in Overall Satisfaction by Service Registration and Disability Type**

Approximately fifty percent of students who registered with the disability service provider had LD/ADD recorded as their disability, compared to less than twenty-five percent of students who did not register. Therefore, differences in satisfaction between the registered and unregistered students could simply be a reflection of the different proportions of students with LD/ADD in the samples. The aim of the analyses that follow is to examine whether registering for disability related services had different outcomes depending on disability type. We compared students without disabilities, students with LD/ADD and the remaining students with disabilities who were classified as ‘Other’, meaning having a disability other than LD/ADD. The mean differences among the three groups (Registered, Not registered, No disabilities) by disability type were compared for the twelve scales for both females and males using MANOVA, followed by post-hoc comparisons (Tukey – HSD). Item differences were compared using one-way ANOVA, as was done in the previous item comparisons.

### **7.1 Females With LD/ADD and Service Registration**

#### *SSI Scale Satisfaction and Disability Services Registration - Females With LD/ADD*

Using MANOVA and mean replacement, the differences in mean satisfaction among the twelve SSI scales were compared for females with LD/ADD who registered for services (N = 57), females with LD/ADD who did not register for services (N = 20) and females without disabilities (N = 3479). The initial MANOVA was significant (Wilks'  $\lambda = 0.98$ ,  $F(24, 7084) = 2.29$ ,  $p < .001$ ).

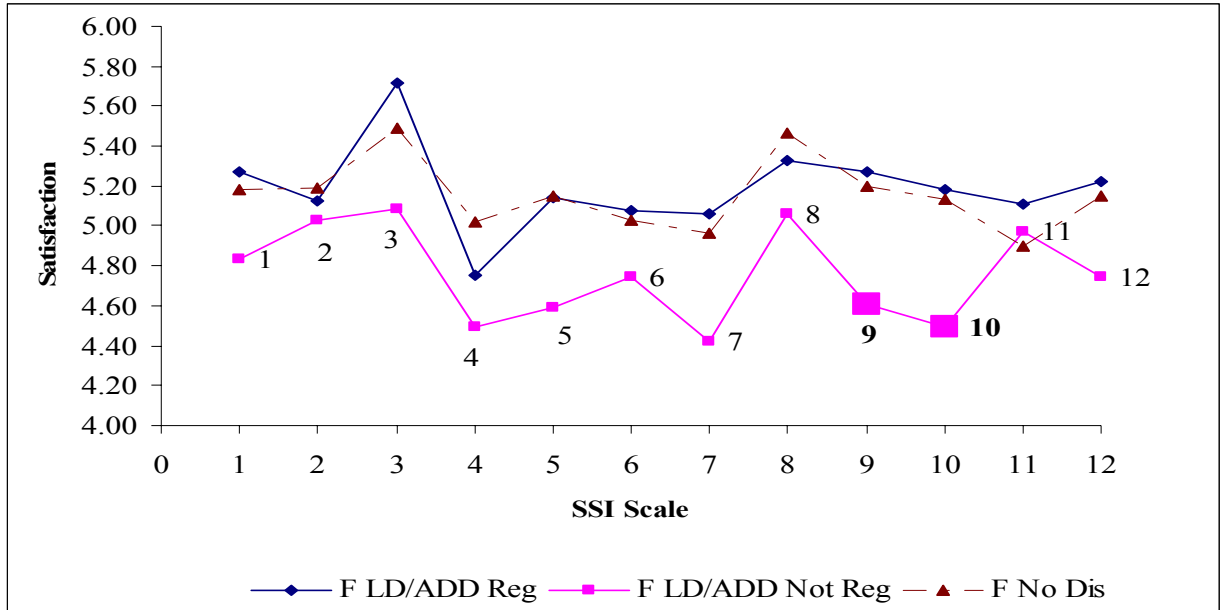


The post-hoc tests (Tukey HSD) indicated that females with LD/ADD who registered for services appeared as satisfied as their non-disabled peers. There were no significant differences between these two groups on the post-hoc comparisons. Figure 21 shows that the differences between the two groups were scattered about the zero difference line, with four falling below and eight above the line. The overall average difference for the twelve means was 0.03. The similarities in satisfaction between the registered females with LD/ADD and females without disabilities can be seen in Figure 20, which compares the means for the two groups on the twelve scales.

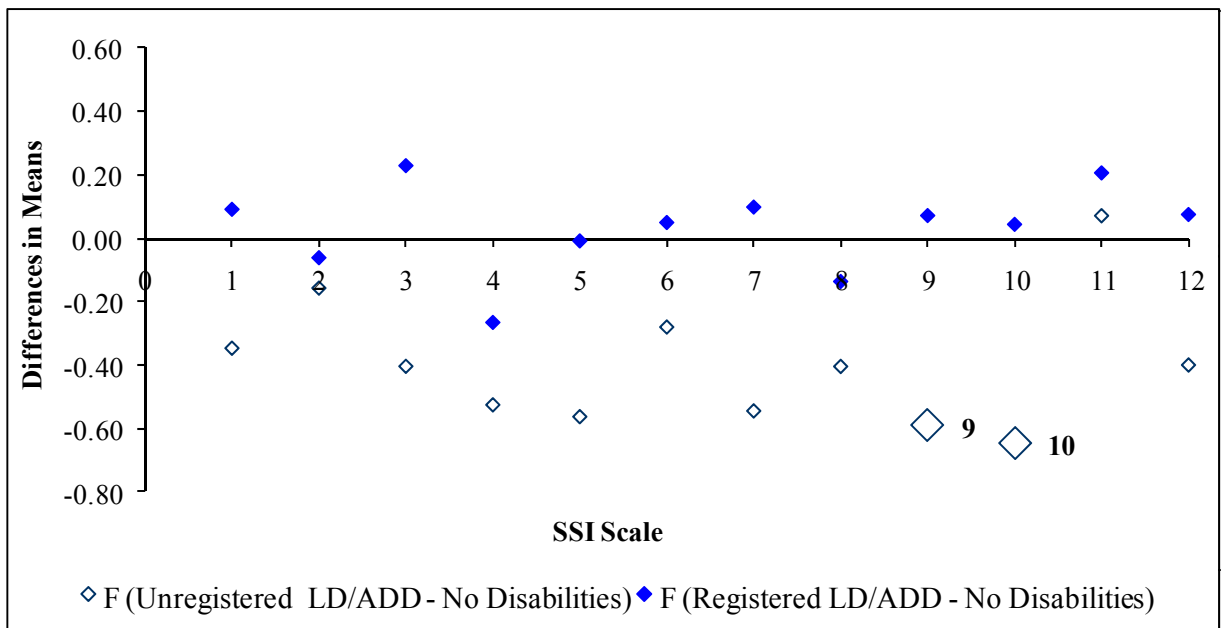
However, when the differences in means between unregistered females with LD/ADD and females with no disabilities were plotted, the *Registration Effectiveness (Scale 9)* and *Service Excellence (Scale 10)* scales showed significantly lower satisfaction for the unregistered females with LD/ADD (Figure 20). Even though only two of the scale differences were statistically significant, all the differences were below the zero reference line, as can be seen from Figure 21. The overall average difference for the twelve means was 0.40. Scale 4 (*Campus Support Services*) was significant on the initial MANOVA, but none of the post hoc tests were significant despite the relatively large difference in satisfaction of 0.53 between unregistered and registered females.

The results of the comparison of unregistered females with LD/ADD with registered females showed the same two scales to be significantly lower for the unregistered females, as was the case in the previous comparison.

**Figure 20. Mean Satisfaction by Scale Comparing Registered and Unregistered Females With LD/ADD and Females Without Disabilities.** (Scales where the differences in satisfaction between unregistered females and females without disabilities were statistically significant ( $p < .05$ ) are highlighted using larger symbols and bolded scale numbers;  $N = 12$  Scales).



**Figure 21. Differences in Mean Satisfaction by Scale Comparing Registered and Unregistered Females With LD/ADD With Females Without Disabilities.**



### *SSI Item Satisfaction and Service Registration - Females with LD/ADD*

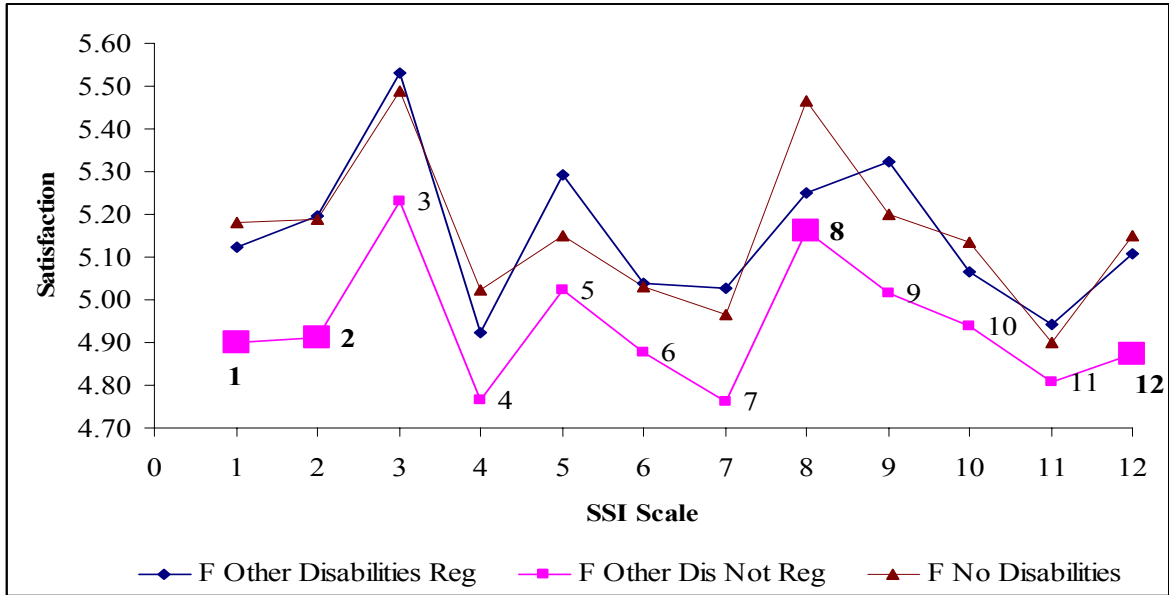
Further support for our contention that registered females with LD/ADD were as satisfied as their non-disabled peers can be seen when the differences in item satisfaction scores between the two groups are compared. Again, if a Bonferroni correction to the alpha level is applied only items with  $p < .001$  remain significant. However, in order not to miss differences which could prove important, given the small numbers of students with LD/ADD who did not register for services ( $n = 20$ ), we used .05 as the cutoff, but indicate associated  $p$  values for the relevant items in Table 16. Figure 25 shows that three of the differences in item scores between registered females with LD/ADD and females with no disabilities were higher for the registered LD/ADD group, and one lower. The seventy-three items scatter about the zero reference line, with thirty-two differences falling above and forty-one falling below the line. It could be argued, then, that although for the most part females with LD/ADD were as satisfied as their non-disabled peers, there were three areas where they were more satisfied and one where they were less satisfied. The item with the largest difference, and that was significantly lower for the registered females with LD/ADD, was *Item 66 (Program requirements are clear and reasonable (difference = -0.63;  $p = .001$ ))*. The three items with higher satisfaction for registered females are as follows:

*Item 7 - Adequate financial aid is available for most students at this institution. (difference = + 0.77;  $p = .017$ )).*

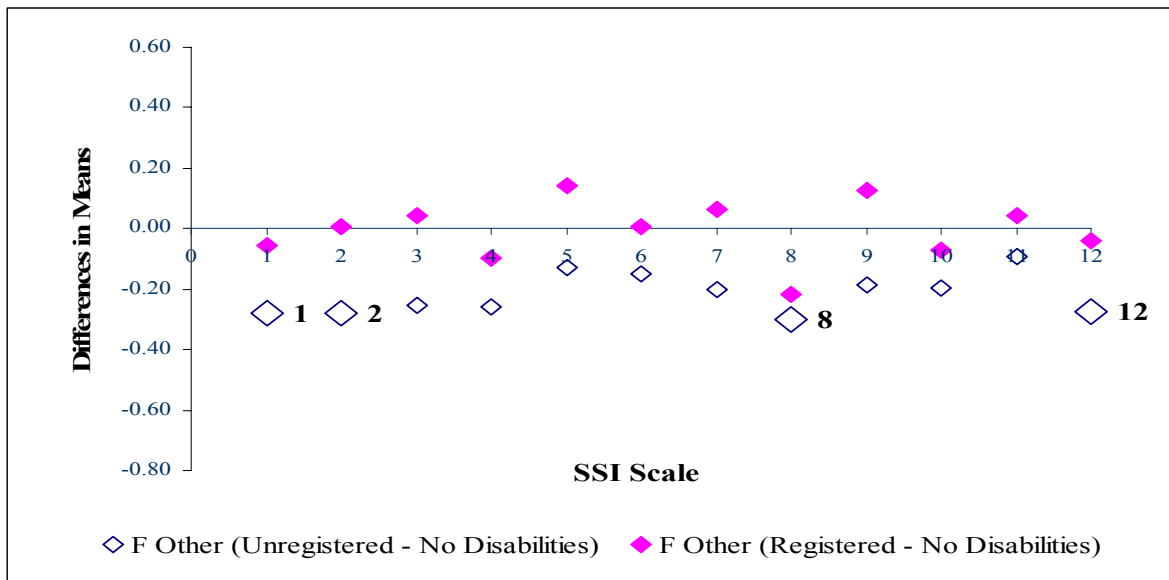
*Item 8 - Classes are scheduled at times that are convenient for me. (difference = + 0.53;  $p = .042$ ).*

*Item 49 - Student recruitment and admissions personnel respond to prospective students' unique needs and requests. (difference = + 0.49;  $p = .031$ ).*

**Figure 22. Mean Satisfaction by Scale Comparing Registered and Unregistered Females With ‘Other’ Disabilities and Females Without Disabilities.** (Scales where the differences in satisfaction between unregistered females and females without disabilities were statistically significant ( $p < .05$ ) are highlighted using larger symbols and bolded scale numbers;  $N = 12$  Scales).



**Figure 23. Differences in Satisfaction by SSI Scale – Registered and Unregistered Females with ‘Other’ Disabilities Compared to Females Without Disabilities.**



When we compared differences in item satisfaction between females with LD/ADD who did not register for services and their non-disabled peers, the majority of the item scores (59 of 73 items) were lower for the unregistered group (Figure 24). Using  $p < .05$  as the cutoff, eight items had lower satisfaction for females with LD/ADD who did not register with the service provider and these are listed in Table 16. Table 16 summarizes the SSI item differences for registered and unregistered females with LD/ADD relative to non-disabled females. Differences in satisfaction means with the associated  $p$  values are shown. The eight items that were significantly lower for unregistered females with LD/ADD, were not significantly different from females without disabilities for the registered LD/ADD females. In addition, for three items where there were no significant differences between females without disabilities and unregistered LD/ADD females, two were higher for registered LD/ADD females, while one was lower. The two items with the largest differences between unregistered LD/ADD females and females without disabilities, and that were significantly lower for the unregistered group with  $p \leq .001$ , were as follows:

*(Item 7) - Adequate financial aid is available for most students at this institution. (difference = -1.43) ( $p = .001$ ).*

*(Item 22) - People on this campus respect and are supportive of each other. (difference = -1.32) ( $p < .001$ ).*

## **7.2 Females with ‘Other’ Disabilities and Disability Service Registration**

### *SSI Scale Satisfaction and Disability Services Registration – Females With ‘Other’ Disabilities)*

Females with disabilities in the ‘Other’ category who registered for services ( $N = 58$ ) appeared as satisfied with their college experiences as their non-disabled peers ( $N = 3479$ ) (Figure 22). The overall average difference in SSI scale means was  $< 0.01$ . The scale differences scattered about the zero difference line with seven points falling above and five below the line (Figure 23). There were no statistically significant differences in mean satisfaction for any of the scales.

However, when the differences between unregistered females with disabilities in the ‘Other’ disability group (N = 85) and females with no disabilities (N = 3479) were plotted, all points fell below the zero reference line, and four of the scales showed statistically significant lower satisfaction for unregistered females. The scales with means that were significantly lower were as follows: *Student Centeredness (Scale 1)*; *Instructional Effectiveness (Scale 2)*; *Academic Services (Scale 8)*; and *Campus Climate (Scale 12)*. The overall average difference for the twelve means was 0.22, somewhat lower than that of the LD/ADD comparison.

The overall average difference between unregistered and registered females in the ‘Other’ disability category was 0.21. However, none of the differences were statistically significant even though the order of magnitude of the differences was similar to that seen between unregistered females in the ‘Other’ category and their non-disabled peers.

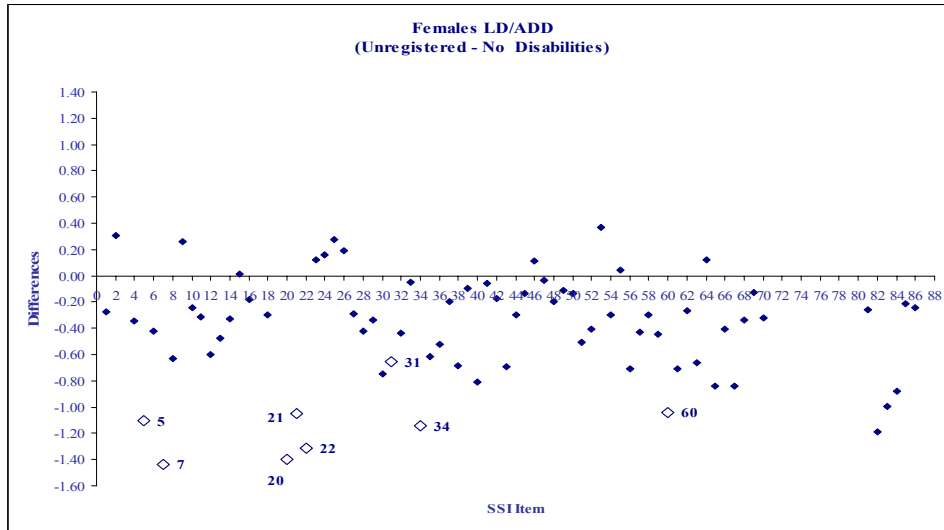
#### *SSI Item Satisfaction and Disability Services Registration – Females With ‘Other’ Disabilities*

The differences in item satisfaction scores between unregistered and registered females with ‘Other’ disabilities and females without disabilities are shown in Figure 26 and Figure 27, respectively. For the unregistered/no disability comparison it can be seen that nearly all the item satisfaction scores (68 of 73) fell below the zero reference line, and of these thirteen items were statistically significant ( $p < .05$ ), with lower satisfaction for the unregistered females (Figure 26). Table 17 lists these differences, as well as differences in item satisfaction for registered females with ‘Other’ disabilities relative to their non-disabled peers.

When the differences between registered females with ‘Other’ disabilities were compared to females without disabilities, there were no significant differences for any of the items. Differences were evenly spread, with 38 falling above and 37 below the zero reference line (Figure 27).

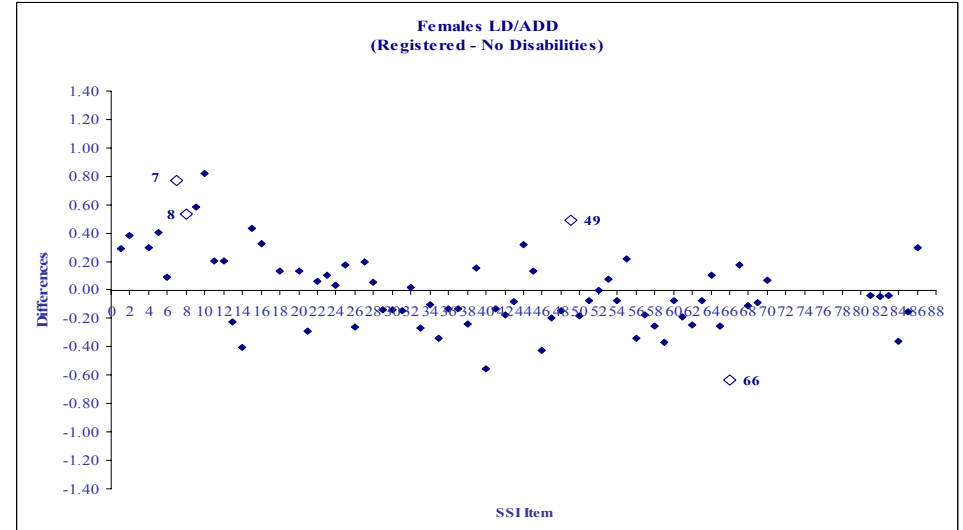
**Figure 24.**

**Females With LDADD (Unregistered – No Disabilities)**



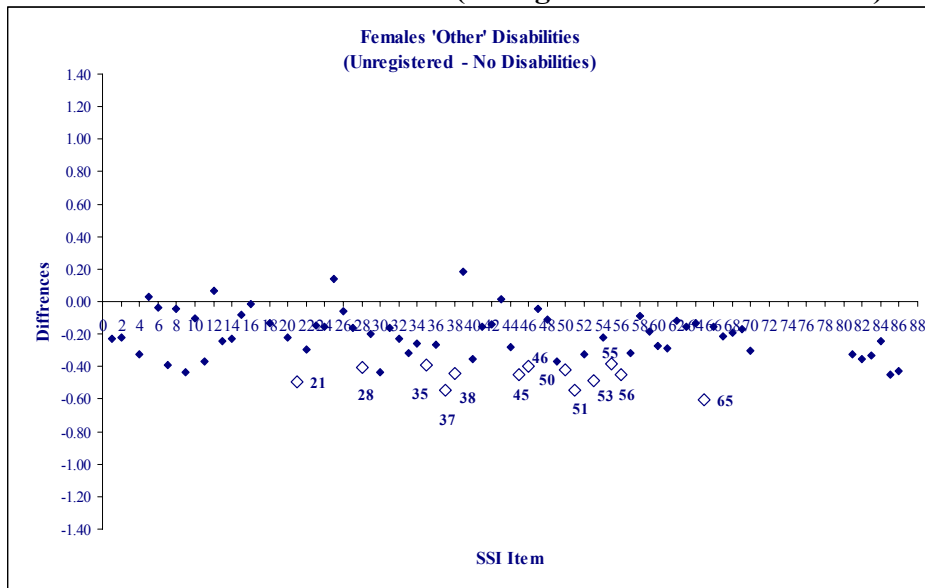
**Figure 25.**

**Females With LDADD (Registered – No Disabilities)**



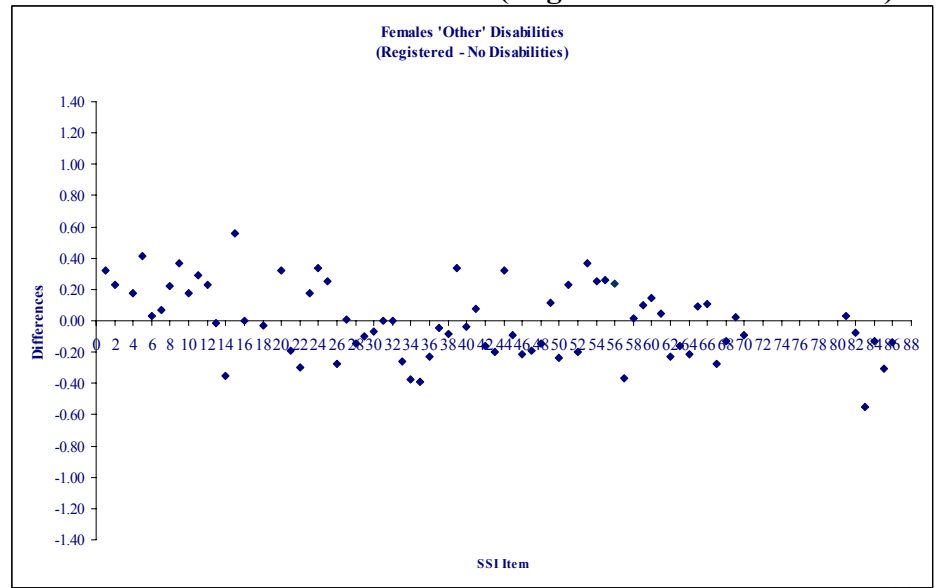
**Figure 26.**

**Females 'Other' Disabilities (Unregistered – No Disabilities).**



**Figure 27.**

**Females 'Other' Disabilities (Registered – No Disabilities).**



Females with ‘Other’ disabilities who registered with the service provider appeared as satisfied as their non-disabled peers. All thirteen items with significantly lower satisfaction scores for unregistered females (using the  $p < .05$  cutoff) relative to their non-disabled peers, were not substantially different for females who registered with the service provider (Table 17).

### **7.3 Males With LD/ADD and Service Registration**

#### *SSI Scale Satisfaction and Disability Services Registration - Males With LD/ADD*

When the mean differences in satisfaction among the twelve SSI scales were compared for males with LD/ADD who registered for services ( $N = 39$ ), males with LD/ADD who did not register ( $N = 23$ ) and males without disabilities ( $N = 2192$ ) the MANOVA was not significant. The largest difference between unregistered males with LD/ADD and males without disabilities was on the *Campus Support Services* (-.41) scale. Although not significant at  $p < .05$ , it was significant at  $p = .10$ .

The results of the plots of the differences between males with LD/ADD who registered and those who did not register with the disability services provider, and males without disabilities are shown in Figure 28. Although none of the twelve differences were statistically significant, all were in the negative direction for both registered and unregistered males with LD/ADD. The pattern, despite the lack of significance, suggests that males with LD/ADD may in fact be less satisfied than their non-disabled peers, regardless of whether or not they registered for services. The overall average difference in means for the twelve scales for the three groups were as follows 1) Males with LD/ADD who did not register with the services provider minus males who did: = -0.08; 2) Males with LD/ADD who did not register with the service provider minus males without disabilities = -0.25; 3) Males with LD/ADD who registered with the service provider minus males without disabilities = - 0.16).

#### *Males With LDD/ADD and Item Satisfaction*

Further support for our contention that both registered and unregistered males with LD/ADD are less satisfied than their non-disabled peers regardless of service registration



can be seen when the differences in item satisfaction scores are compared (Figure 30 and Figure 31). Figure 30 shows that three of the differences in item scores between unregistered males with LD/ADD and males with no disabilities are significantly lower for the LD/ADD group. However, although only three items are lower (using  $p < .05$  as the cutoff), the majority of items show negative differences. This pattern remains the same when we compare the differences between registered males with LD/ADD and the non-disabled group. This is in stark contrast to the comparison for males with other disabilities, where there are clear differences between males with ‘Other’ disabilities who did and did not register with the service provider. Table 16 summarizes the SSI item differences for registered and unregistered males with LD/ADD relative to males without disabilities.

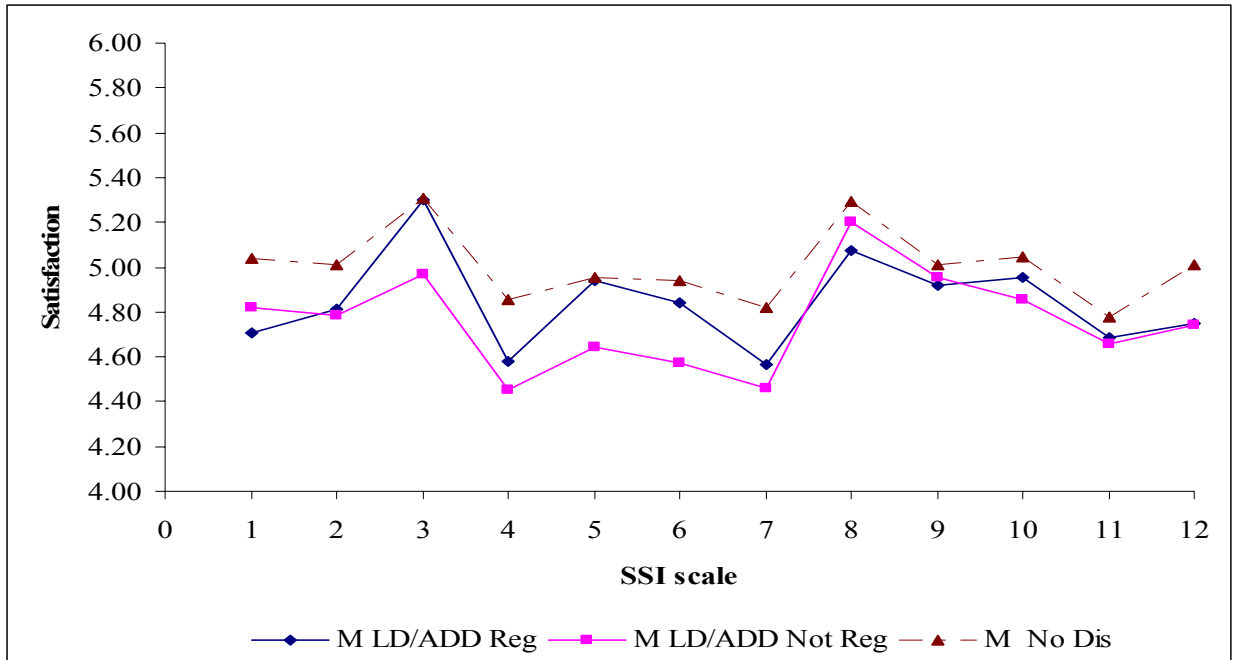
#### **7.4 Males With ‘Other’ Disabilities and Service Registration**

##### *SSI Scale Satisfaction and Disability Services Registration – Males With ‘Other’ Disabilities*

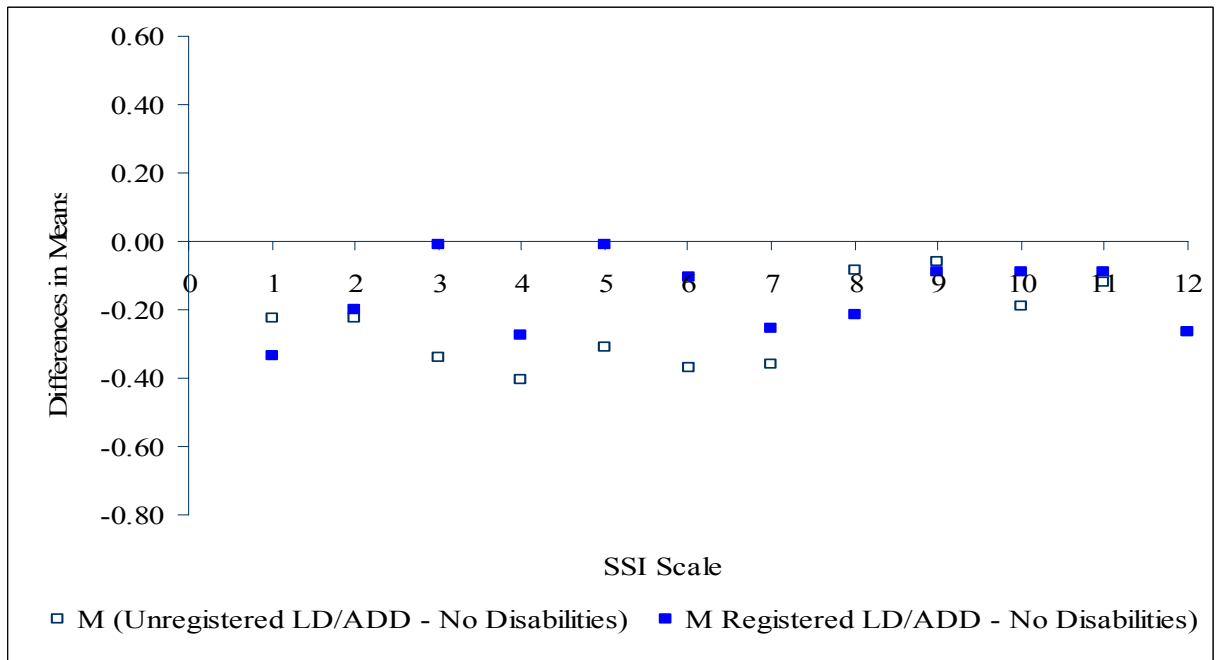
When the mean differences in satisfaction among the twelve SSI scales were compared for males with ‘Other’ disabilities who registered for services ( $N = 38$ ), males with ‘Other’ disabilities who did not register ( $N = 74$ ) and males without disabilities ( $N = 2192$ ), the initial MANOVA was significant (Wilks’  $\lambda = 0.98$ ,  $F(24, 4582) = 1.58$ ,  $p = .041$ ).

Males in the ‘Other’ disabilities category who registered for services appeared more satisfied compared to both their unregistered counterparts and to males without disabilities (Figure 34). Even though the post-hoc comparisons showed only one scale (*Scale 11 - Concern for the Individual*) to be significantly higher for the registered males with ‘Other’ disabilities compared to males without disabilities, all differences in mean satisfaction were above the zero reference line (Figure 35). On the other hand, males in the ‘Other’ disability category who did not register for services were significantly less satisfied than males without disabilities. On the post-hoc comparisons, five scales showed significantly lower satisfaction between unregistered males in the ‘Other’ disabilities category and males without disabilities. The five scales were *Scale 1 - Student Centeredness*; *Scale 4 - Campus Support Services*; *Scale 8 - Academic Services*; *Scale 10 - Service Excellence*; and *Scale 12 - Campus Climate*.

**Figure 28. Mean Satisfaction by SSI Scale Comparing Registered and Unregistered Males With LD/ADD and Males Without Disabilities.**



**Figure 29. Differences in Satisfaction by SSI Scale – Registered and Unregistered Males with LD/ADD Compared to Males Without Disabilities.**



These are shown in Figure 34 and Figure 35, with the scales showing differences highlighted. Five scales were also significantly lower for unregistered males with other disabilities compared to their registered counterparts, three of which were common to the previous comparison (*Scales 1, 10 and 12*). In addition *Scale 6 - Academic Advising/Counseling* and *Scale 11 - Concern for the Individual* were also lower.

#### *SSI Item Satisfaction and Disability Services Registration – Males With ‘Other’ Disabilities*

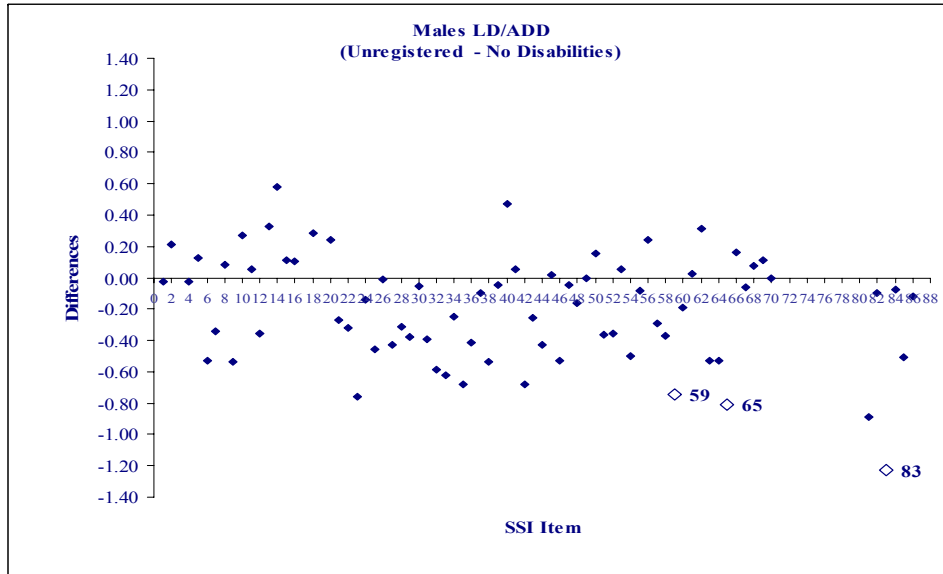
The differences in item satisfaction scores between unregistered males and registered males with ‘Other’ disabilities and students without disabilities are shown in Figure 32 and Figure 33 respectively. For the unregistered/no disability comparison it can be seen that nearly all the item satisfaction scores fell below the zero references line and, of these, seventeen showed statistically significant lower satisfaction for the unregistered group (if we use  $p < .05$  as we have done in our previous comparisons). However, when the differences for registered males were compared to males without disabilities, the majority of differences were positive, and five items had higher satisfaction scores for males who registered with the service provider. Table 17 summarizes the SSI item differences for registered and unregistered males with ‘Other’ disabilities relative to their non-disabled peers. From Table 17 it can be seen that the seventeen items that were lower for unregistered males compared to their non-disabled counterparts were comparable for registered males. On the other hand, five items that did not show a significance difference between unregistered males and males without disabilities, were higher registered males.

### **7.5 Summary – Satisfaction, Services Registration and Type of Disability**

Registering for services appears to have a different impact on satisfaction depending on sex and disability type. Although only two scales for females with LD/ADD and four scales for females with ‘Other’ disabilities showed differences that were lower for females who did not register, all differences were in the same direction.

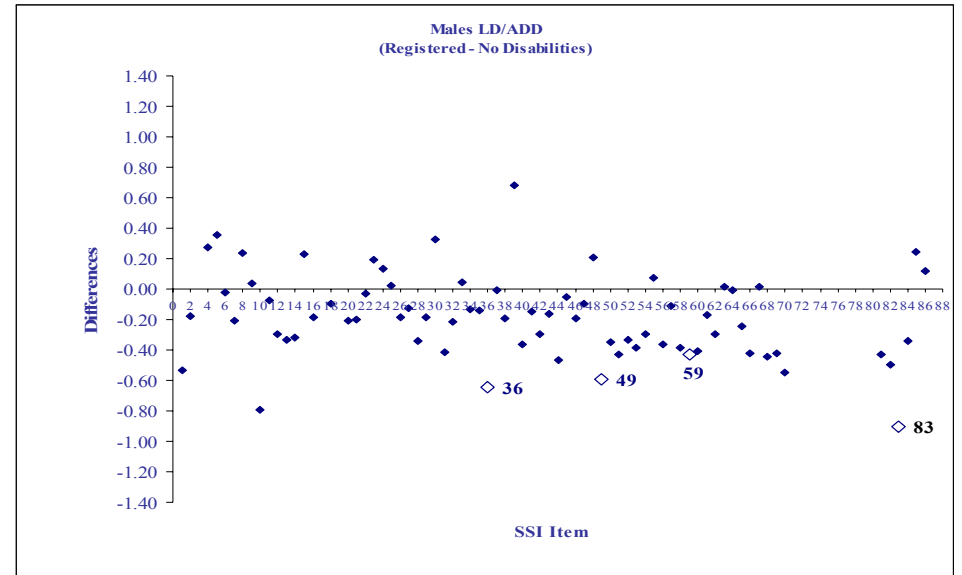
**Figure 30.**

**Males With LD/ADD (Unregistered – No Disabilities).**



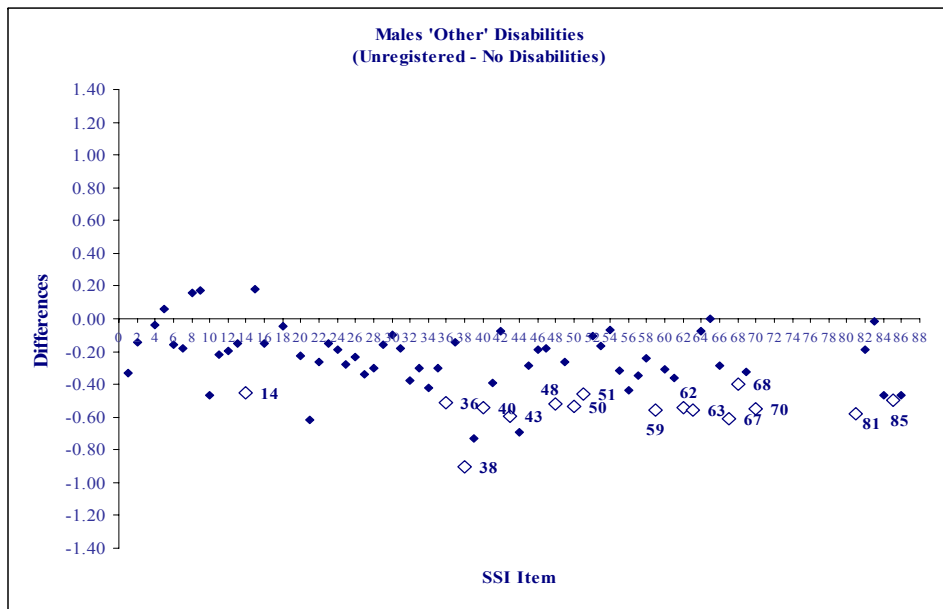
**Figure 31.**

**Males With LDADD (Registered – No Disabilities).**



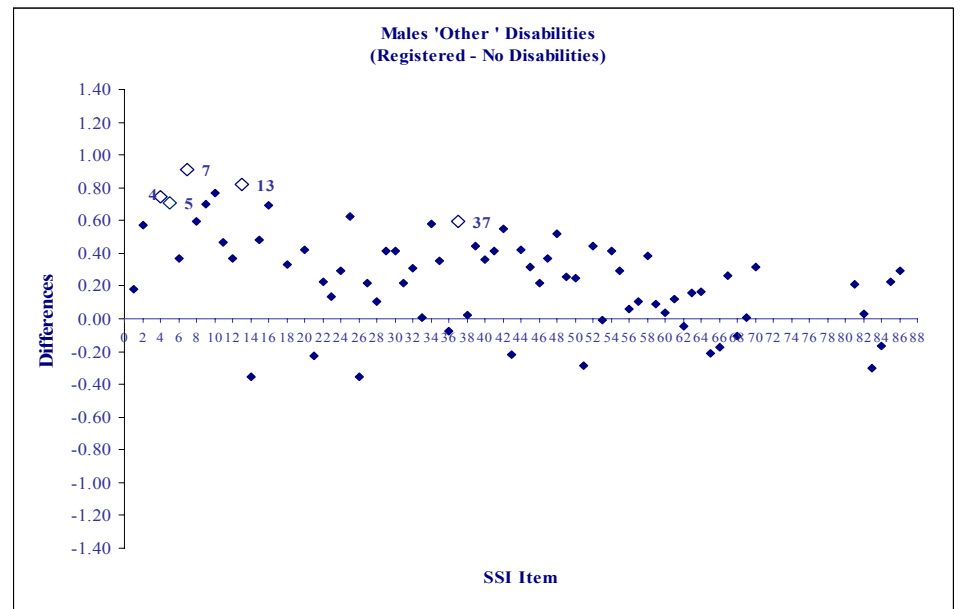
**Figure 32.**

**Males 'Other' Disabilities (Unregistered – No Disabilities).**

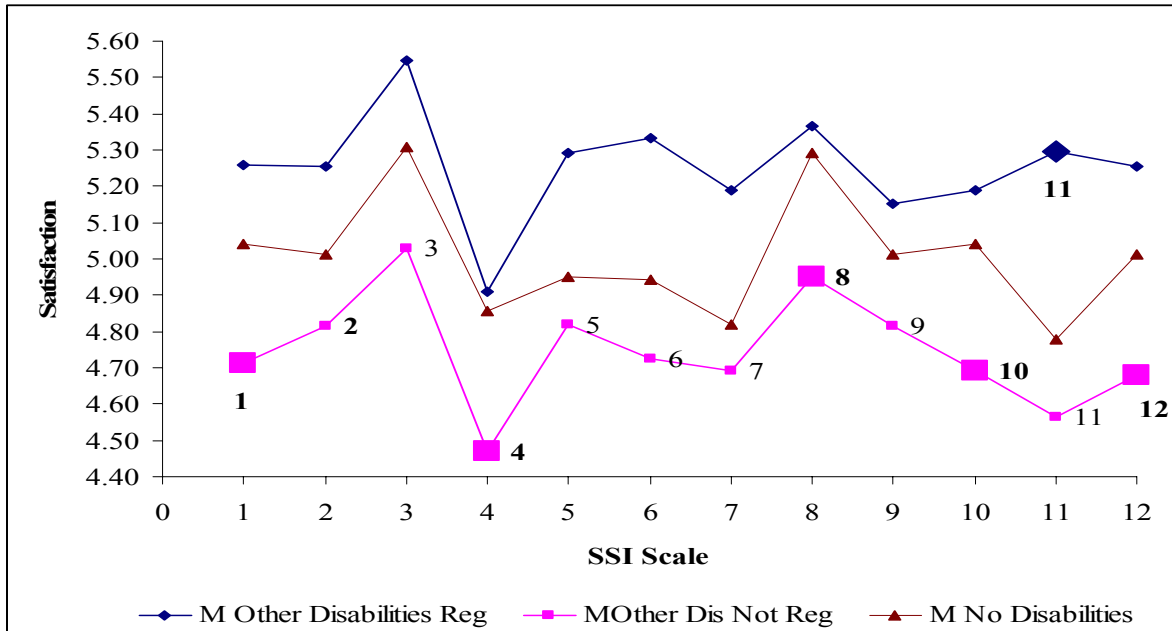


**Figure 33.**

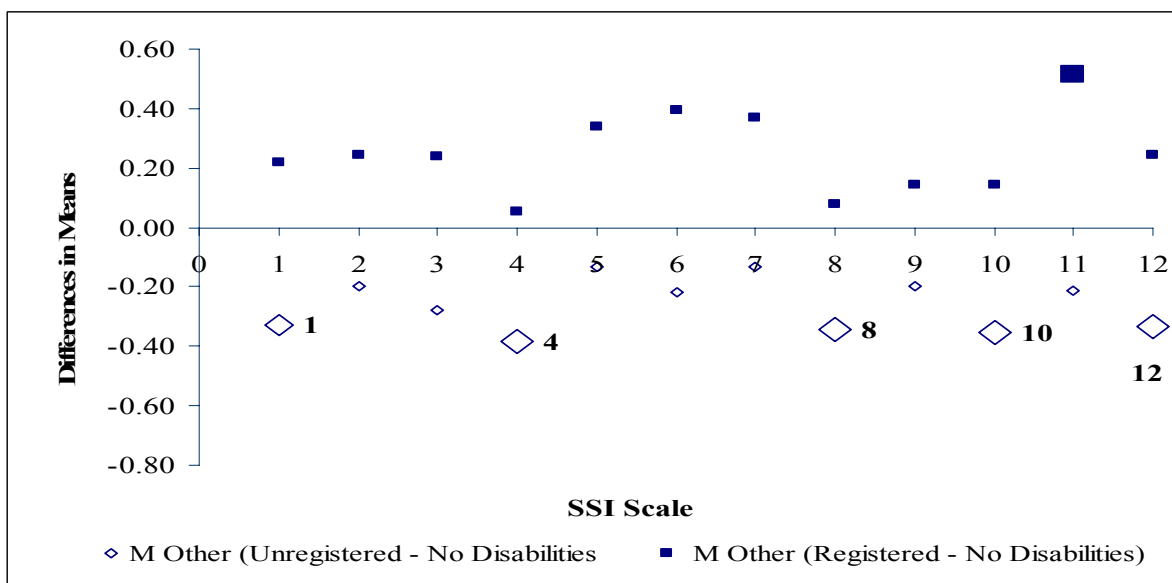
**Males 'Other' Disabilities (Registered – No Disabilities).**



**Figure 34. Satisfaction by SSI Scale – Comparing Registered and Unregistered Males with ‘Other’ Disabilities and Males Without Disabilities.** (Scales where the differences in satisfaction between registered/unregistered males and males without disabilities were statistically significant ( $p < .05$ ) are highlighted using larger symbols and bolded scale numbers).



**Figure 35. Differences in Satisfaction by SSI Scale – Registered and Unregistered Males with ‘Other’ Disabilities Compared to Males Without Disabilities.**



**Table 16. Comparison of SSI Item Satisfaction Between Registered and Unregistered Females/Males With LD/ADD and Females/Males Without Disabilities.** (Average differences in satisfaction between males and females without disabilities and the group compared are shown in brackets.. The p values are shown in brackets for items with  $p < .05$ .)

	<b>Females LD/ADD</b>		<b>Males LD/ADD</b>	
	<b>Unregistered (-0.41)</b>	<b>Registered (0.00)</b>	<b>Unregistered (-0.20)</b>	<b>Registered (-0.18)</b>
<b>Exceeded</b> Females/Males No Disabilities		7. Adequate financial ..... (+.77; p = .017) 8. Classes are scheduled ... (+ .53; p =.042) 49. Student recruitment and admissions personnel respond to prospective ....(+.49; p = .031)		
<b>The same as</b> Females/Males No Disabilities No Differences	8. Classes are scheduled at times that are convenient for me. 49. Student recruitment and admissions personnel respond to prospective .....	5. The personnel involved in registration are helpful. 20. Student awards/financial aid staff are helpful. 21. There are a sufficient number of study areas available. 22. People on this campus respect and are supportive of each other. 31. The campus is safe and secure for all students. 34. Computer labs are adequate and accessible. 60. Billing policies are reasonable.	36. Students are made to feel welcome .... 49. Student recruitment and admissions personnel respond to prospective .....	65. Students are notified early ... 59. New student orientation ....
<b>Below</b> Females/Males No Disabilities	5. The personnel involved in registration are helpful (-1.10; p = .011) 7. Adequate financial aid is available for most students at this institution. (-1.43; p = .001) 20. Student awards/financial aid staff are helpful. (-1.40; p = .002). 21. There are a sufficient number of study areas available. (-1.05; p = 010) 22. People on this campus respect and are supportive of each .. (-1.32; p < .001) 31. The campus is safe and secure for all students. (-0.66; p = .050) 34. Computer labs are adequate and accessible. (-1.14; p = .010.) 60. Billing policies are reasonable. (-1.05; p = .005)	66. Program requirements are ...(-.63; p = .001)	59. New student orientation services help students .... (- 0.75; p = .05) 65. Students are notified early in the term .....(- .81; p = .05) 83. Older, returning learners? (-1.23; p = .020)	36. Students are made to feel welcome .... (-.064; p = .015) 49. Student recruitment and admissions personnel respond ... (--- -0.59; p = .037 ) 83. Older, returning learners? (-.0.90; p = .013)

**Table 17. Comparison of SSI Item Satisfaction Between Registered and Unregistered Females /Males With ‘Other’ Disabilities and Females/Males Without Disabilities.** (Average differences in satisfaction between males and females without disabilities and the group compared are shown in brackets. Differences and p values are shown in brackets for items with  $p < .05$ ).

	Females 'Other' Disabilities		Males 'Other' Disabilities	
	Unregistered (-0.25)	Registered (0.00)	Unregistered (- 0.30)	Registered (+0.26)
Exceeded Females/Males No Disabilities				4. Security staff ... (+.75; p = .014 5. The personnel ... (+.71; p = .038) 7. Adequate finance.. (+.91; p = .014) 13. Scholarships.... (+.82; p = .031) 37. Faculty take.. (+.59; p = .035)
<b>The same as</b> Females/Males No Disabilities		21. There are a sufficient number of study areas 28. It is an enjoyable experience to be a student ... 35. Policies and procedures regarding 37. Faculty take into consideration student ... 38. The student centre/lounge areas are ... 45. This institution has a good reputation within .. 46. Faculty provide timely feedback about student 50. Tutoring services are readily available. 51. There are convenient ways of paying ..... 53. The assessment and course placement/ ... 55. Student success/academic support services ... 56. The business/administration office is open ... 65. Students are notified early in the term if they..	4. Security staff are helpful. 5. The personnel involved in registration ... 7. Adequate financial aid is available .... 13. Scholarships and bursaries are ... 37. Faculty take into consideration ...	14. Library resources and services 21. There are a sufficient number of 36. Students are made to feel 38. The student centre/lounge areas 40. Academic advisors/counsellors 43. Class change (drop/add) policies 48. Personal counselling staff care ... 50. Tutoring services are readily 51. There are convenient ways of 59. New student orientation services 62. Bookstore staff are helpful. 63. I seldom get the "run-around" .... 67. Channels for expressing student 68. On the whole, the campus is well 70. I am able to experience 81. Part-time students? 85. Commuters?
Below Females/Males No Disabilities	21. There are a sufficient ... (-.49; p = .01) 28. It is an enjoyable exp...(-.41) (p = .020) 35. Policies and proced ... (-.39; p = .049) 37. Faculty take into consid..(-.54; p = .001) 38. The student centre .. (-.44; p = .040) 45. This institution has a good (-.45; p = .010) 46. Faculty provide timely ... (-.40; p = .039) 50. Tutoring services readily .. (-.42; p = .046) 51. There are convenient ways.(-.54; p = .002) 53. The assessment and .... (-.49; p = .006) 55. Student success/academic: (-.38; p = .049) 56. The business/administ ....(-.45; p = .040) 65. Students are notified early ..(-.61; p = .003)		14. Library resources ... (-.48; p=.018) 21. There are sufficient.. (-.62; p = .002) 36. Students are made .. (-.51; p =.006) 38. The student centre.. (-.90; p < .001) 40 Academic advisors/.. (-.54; p = .05) 43. Class change (drop/.. (-.60; p =.022) 48. Personal counsel ... (-.52; p = .033) 50. Tutoring services ..(-0.53; p = .020) 51. There are convenient.. (-.46; p = .020) 59. New student orientat...(-.56; p = .008) 62. Bookstore staff...(-.54; p = .006) 63. I seldom."run-around".(-.56; p = .021) 67. Channels for express..(-.61; p = .020) 68. On ..whole, the campus (-.40; p = .022) 70. ..experience intellect (-.55; p = .004) 81. Part-time students? (-0.56; p = .030) 85. Commuters? (-.50; p = .036)	

When the seventy-three SSI items were compared we obtained similar results, with registered females with LD/ADD showing higher satisfaction than females without disabilities on three of the items, lower satisfaction on only one item, with the remainder of the items showing no difference. Females with LD/ADD who did not register showed lower satisfaction on seven items and none were higher. Females with 'Other' disabilities who registered with the service provider showed no differences in satisfaction on any of the items when compared to their non-disabled peers. However, females with 'Other' disabilities who did not register showed lower satisfaction on fourteen items. Generally, for both females with LD/ADD and females with 'Other' Disabilities, registering for services tended to ameliorate areas of dissatisfaction expressed by females with disabilities who did not register and thus tends to 'levels the playing field' relative to females without disabilities.

However, the pattern for males with LD/ADD seems to suggest that they were less satisfied than males without disabilities, regardless of whether or not they registered with the service provider. Although there were no significant differences on the scale comparisons, all differences between males with LD/ADD and males without disabilities were in the same direction, with lower satisfaction for both the registered and unregistered males. The item comparisons also supports this conclusion, with the majority of items falling below the zero difference reference line, and a number of items showing lower satisfaction for both registered and unregistered males.

On the other hand, males with 'Other' disabilities not only had satisfaction levels equivalent to their non-disabled peers, but in some areas expressed even greater satisfaction. This was seen in both the scale and item comparisons. The registered males with disabilities other than LD/ADD appeared to be the group that benefited most from registering for services, as expressed by their greater satisfaction with many different aspects of their college life compared to both unregistered males and males without disabilities.



The satisfaction of students with disabilities who did not register for services differed in a number of ways from those who did register. These differences are summarized in Table 18.

**Table 18. Number of Items Showing Differences in Satisfaction Levels for Student With Disabilities as a Function of Services Registration - Comparing Females and Males With Disabilities Relative to Their Non-disabled Peers** (*Total number of items evaluated = 73*).

<b>Differences in Satisfaction And Disabilities Services Registration</b>	<b>Females LD/ADD</b>	<b>Males LD/ADD</b>	<b>Females 'Other' Disabilities</b>	<b>Males 'Other' Disabilities</b>
Satisfaction, for unregistered students with disabilities was lower than that of students without disabilities but was equivalent to students without disabilities for those who registered.	7	2	13	17
Satisfaction, for unregistered students with disabilities was lower than that of students without disabilities, but exceeded that of students without disabilities for those who registered.	1	0	0	0
Satisfaction, for both registered and unregistered students with disabilities, was lower than that of students without disabilities.	0	1	0	0
Satisfaction for unregistered students with disabilities was equivalent to students without disabilities, but was lower than students without disabilities for unregistered students.	1	2	0	0
Satisfaction, for unregistered students with disabilities was equivalent to students without disabilities, but was higher than students without disabilities for registered students.	2	0	0	5
Satisfaction, for both registered and unregistered students with disabilities was equivalent to students without disabilities.	62	68	60	51
<b>Total Items Compared</b>	<b>73</b>	<b>73</b>	<b>73</b>	<b>73</b>

The majority of the items showed no differences in satisfaction that were statistically significant, regardless of service registration. When there were statistically significant differences among groups, generally, the differences were due to satisfaction levels that were lower for unregistered students with disabilities than for students without disabilities but did not differ from students without disabilities for students who registered for services. However, for males with ‘Other’ disabilities, five items where satisfaction levels of unregistered males were equivalent to their non-disabled peers, were higher for registered males. This tends to suggest that registering for services tends to ameliorate the areas of dissatisfaction experienced by unregistered students and levels the playing field relative to students without disabilities. There were also three instances, all for the LD/ADD group, where satisfaction levels for unregistered students were equivalent to students without disabilities, but below students without disabilities for registered students.

Our hypothesis that students with disabilities who registered with the disability services provider at the College would be more satisfied than students with disabilities who did not register was supported, with the exception of males with LD/ADD. In some instances, satisfaction of registered males and females with disabilities exceeded that of their non-disabled peers. This was especially evident for males with ‘Other’ disabilities. Although many of differences between the registered males and males without disabilities in the ‘Other’ disability group were not statistically significant, of the seventy-three items evaluated the majority of the satisfaction scores were higher for males who registered for disability services than those who did not do so. This group seems to benefit most from service registration.

## **8 Satisfaction and Academic Grades**

One of our hypotheses was that satisfaction with *Instructional Effectiveness* would be the strongest predictor of academic performance. To test this hypothesis we used the students’ accumulated CRCM, a weighted grade average described earlier, as a measure of academic performance. We examined the strength of the correlation of the CRCM with the global satisfaction (OS) variable, the *Instructional Effectiveness* scale score and the remaining eleven satisfaction scale scores (using Pearson correlation coefficients). The mean CRCMs

for seven levels of the Overall Satisfaction variable (scale range was from 1 – 7) were compared using ANOVA. Using binary logistic regression (with forward conditional entry) we then tested how well these variables were able to predict academic performance by comparing the areas under the ROC curves constructed from the probabilities generated by the logistic regression models. The binary variable in the model was  $\text{CRCM} > 26 = 1$ ;  $\text{CRCM} \leq 26 = 0$ . This split was chosen as it was approximately the score required for entrance in a Quebec university, and it resulted in a large enough number of scores at both levels of the variable for a meaningful analysis. All the logistic regression metrics used to compare the predictive value of the variables were not significant for students with disabilities, so the regression analysis limits itself to students without disabilities.

## 8.1 Correlation of Grades and Satisfaction

### *Students Without Disabilities – Overall (OS) and SSI Scales*

For both males and females without disabilities, the strength of the correlations of the CRCM with the global satisfaction (OS) variable exceeded that observed with the Instructional Effectiveness (IE) scale. Seven of the twelve satisfaction scales had weak but significant correlations with the CRCM for females, and three of the scales were significant for males. The IE scale had the strongest correlation with the CRCM for females, although the strength of the correlation with the *Student Centeredness* scale was equally high ( $r = .069$ ). *Registration Effectiveness* was the scale with the strongest correlation for males ( $r = .055$ ). The correlation coefficients for the SSI scales as well as the OS variable, are shown in Table 19. For students without disabilities, none of the scale correlation coefficients exceeded  $r = .07$ . The OS variable had somewhat stronger correlations with grades ( $r = .14$ ). However, correlations with the scale and OS variables were weak at best, and effect sizes were, therefore, low.

### *Students With Disabilities (Overall (OS) and Scale Satisfaction)*

Of the scale variables we tested for students with disabilities, only one had a significant correlation with grades, and that was the *Safety and Security* scale for females only ( $r = .173$ ). The global OS variable was significant for females, but not males, with a correlation of  $r = .21$  (Table 19).

**Table 19. Correlations Between Grades (CRCM Scores) and SSI Scales for Males and Females With and Without Disabilities.** (*r* = Pearson correlation coefficient. *p* = probability. Statistically significant values are highlighted in bold. (No Disabilities: Females: *N* = 3479; Males: *N* = 2192; With Disabilities: Females *N* = 220; Males *N* = 174).

<i>Scale Variables</i>	Without Disabilities				With Disabilities			
	Females		Males		Females		Males	
	<i>r</i>	<i>p</i>	<i>r</i>	<i>Sig</i>	<i>r</i>	<i>Sig</i>	<i>r</i>	<i>p</i>
1 Student Centeredness	<b>.060</b>	<b>&lt;.001</b>	.033	.124	.077	.256	.058	.450
2 Instructional Effectiveness	<b>.069</b>	<b>&lt;.001</b>	<b>.045</b>	<b>.036</b>	.092	.174	.076	.321
3 Responsiveness to Diverse Populations	<b>.038</b>	<b>.024</b>	.035	.103	.064	.347	-.014	.856
4 Campus Support Services	.008	.639	.003	.890	.083	.223	-.026	.737
5 Safety and Security Academic	.022	.199	.033	.121	<b>.173</b>	<b>.010</b>	.105	.166
6 Advising/Counseling	-.040	.827	.029	.173	-.052	.443	.114	.135
7 Admissions and Financial Aid	.025	.146	.026	.232	.065	.340	.116	.127
8 Academic Services	<b>.064</b>	<b>&lt;.001</b>	.038	.076	.030	.657	.002	.979
9 Registration Effectiveness	<b>.053</b>	<b>.002</b>	<b>.055</b>	<b>.010</b>	.084	.216	.070	.359
10 Service Excellence	<b>.038</b>	<b>.024</b>	.028	.191	.059	.383	-.018	.811
11 Concern for the Individual	.023	.183	.039	.067	.069	.305	.111	.144
12 Campus Climate	<b>.048</b>	<b>.005</b>	<b>.045</b>	<b>.037</b>	.101	.135	.064	.401
OS Overall Satisfaction	<b>.14</b>	<b>&lt;.001</b>	<b>0.11</b>	<b>&lt;.001</b>	<b>.21</b>	<b>.002</b>	<b>.089</b>	<b>.241</b>

The correlation of the OS variable with grades was higher for females with disabilities than for any other group (.21). However, from Table 19 it can be seen that the correlation between grades and satisfaction was low and, therefore, effect sizes small for all groups and variables compared.

## 8.2 Comparison of Mean Grades and Overall Satisfaction (OS)

The mean CRCM scores were compared for each of the seven levels of the OS variable using one-way ANOVA. The results were statistically significant for females and males without disabilities as well as for females with disabilities, but not males.

**Table 20. Outcomes of the ANOVA – Comparing Female and Male Mean CRCM’s by Level of Overall Satisfaction (OS).**

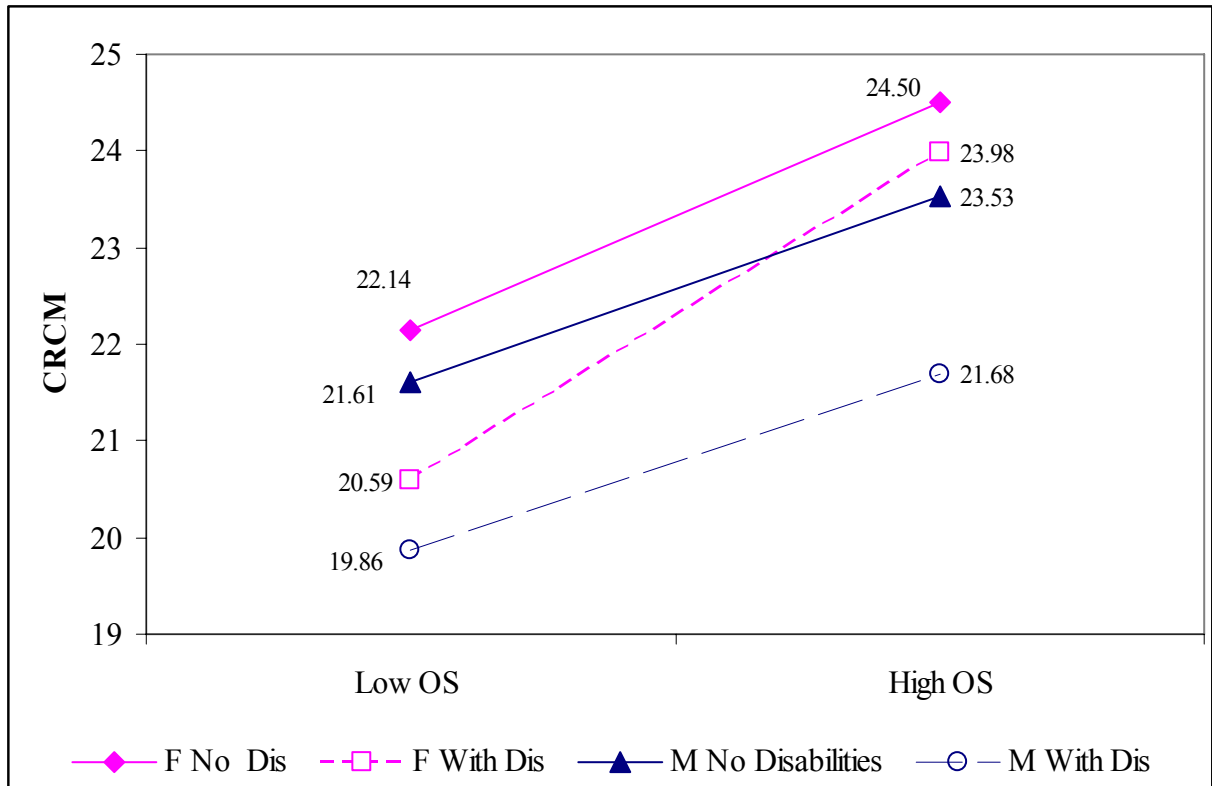
	<b>N</b>	<b>F</b>	<b>df</b>	<b>p</b>
F No Disabilities	3384	12.25	6	<.001
M No Disabilities	2133	5.22	6	<.001
F With Disabilities	216	2.63	6	0.018
M With Disabilities	172	0.95	6	0.460

Figure 36 plots the average CRCM score against Low (1 - 4) and High (5 - 7) levels of the OS variable for males and females without disabilities, and shows lower average CRCMs for students in the Low OS groups. The largest difference in grades was for females with disabilities (3.39) followed by females without disabilities (2.36). The differences for males were somewhat lower (Males with disabilities = 1.82; Males without disabilities = 1.92). The difference for males with disabilities, although larger than for males without disabilities, was not significant. Thus, on average CRCM scores were higher for students who were more satisfied, and the differences were largest for females.

## 8.3 Best Predictors of Grades

The ability of the global variable (OS) and the twelve SSI satisfaction scales to discriminate between students with CRCM scores above and below 26 was tested using logistic regression (with forward conditional entry).

**Figure 36. Grades (CRCM) for Low (1 – 4) and High (5 – 7) Levels of Overall Satisfaction.**



The binary value was  $CRCM \leq 26 = 0$ ;  $CRCM > 26 = 1$ . As mentioned previously, none of the variables we tested entered the model for students with disabilities, and the following discussion relates to students without disabilities only.

*Overall Satisfaction Variable(OS)*

The OS variable entered the regression model for both males and females without disabilities. The Nagelkerke  $R^2$  values and odds ratios  $Exp(B)$  showed only a weak association between grades and OS (Table 21).. Although both the male and female models resulted AUCs that were significantly different from 0.50, both curves rated as ‘Fail’ based on the criteria chosen to evaluate the areas (Table 21).

**Table 21. Logistic Regression Model – Overall Satisfaction (With CRCM as the Binary Variable - Students Without Disabilities).**

SEX	Global	B	S.E.	Wald	df	Sig.	Exp(B)	Nagelkerke R <sup>2</sup>	AUC	*p	Rate AUC
Females N = 3479	OS (Overall Satisfaction)	0.179	0.027	42.6437	1	<.001	1.196	0.017	0.564	<.001	Fail
	Constant	-1.045	0.162	41.548	1	<.001	0.352				
Males N = 2192	OS (Overall Satisfaction)	0.119	0.031	14.630	1	<.001	1.127	0.009	0.538	<.001	Fail
	Constant	-1.021	0.180	32.177	1	<.001	0.360				

\*p = test of probability that the AUC is significantly different from .5.

**Table 22. Logistic Regression Using Twelve Satisfaction Scale Items (with Grades (CRCM) as the Binary Variable - Students Without Disabilities).** (Females: N = 2661; Males: N = 1698).

Sex	B	S.E.	Wald	df	Sig.	Exp(B)	Nagelkerke R <sup>2</sup>	AUC	*p	Rate AUC
<b>Females</b>										
Instructional Effectiveness	0.319	0.070	20.795	1	.000	1.376				
Campus Support Services	-0.136	0.050	7.491	1	.006	0.873				
Academic Advising/Counseling	-0.141	0.051	7.600	1	.006	0.868				
Academic Services	0.240	0.068	12.513	1	<.001	1.271	.029	.573	<.001	Fail
Registration Effectiveness	0.155	0.074	4.335	1	.037	1.168				
Service Excellence	-0.354	0.090	15.668	1	.000	0.702				
Constant	-0.677	0.255	7.028	1	.008	0.508				
<b>Males</b>										
Campus Support Services	-0.229	0.066	11.952	1	.001	0.795				
Student Centeredness	-0.343	0.142	5.796	1	.016	0.710				
Service Excellence	-0.400	0.126	10.100	1	.001	0.670	.023	.558	<.001	Fail
Campus Climate	1.037	0.224	21.471	1	<.001	2.821				
Constant	-0.762	0.277	7.551	1	.006	0.467				

#### *SSI Scale Variables – Females Without Disabilities*

Six of the twelve SSI scale variables, including *Instructional Effectiveness* (which had the highest odds ratio), were significant, and entered the model for females. As can be seen from Table 21, three of the variables had odds ratios of less than one, suggesting that students who had higher satisfaction on these scales received lower grades. These were *Campus Support Services*, *Academic Advising/Counseling* and *Service Excellence*.

Together the Nagelkerke  $R^2$  was .029 and this indicates only a very weak association between the scale variables entered and the CRCM (the possible range of the Nagelkerke  $R^2$  is between 0 and 1).

#### *SSI Scale Variables - Males Without Disabilities*

For males, four of the SSI scale variables, entered the model and these did not include *Instructional Effectiveness*. The combined Nagelkerke  $R^2$  for males was .023. Again, three of the odds ratios were less than one (i.e. the greater the satisfaction score on these scales, the lower the grade). These included *Student Centeredness* as well as *Service Excellence* and *Campus Support Services*. The latter two scales also resulted in odds ratios of less than one for females.

#### *Areas Under the ROC Curves*

For both sexes, the ROC plots constructed from the probabilities generated by the regression models all had areas under the curve that fell between .55 and .60, and although these areas were statistically significant, they rated as ‘fail’. The area under the ROC curve is a measure of the ability to discriminate between the binary variable (in this case CRCM scores above and below 26), and has a range from 0.5 to 1.0. Thus the SSI scale variables, even in combination, had limited ability to discriminate between those with low and high CRC scores.

### **8.4 Summary – Satisfaction and Academic Grades**

Only a small amount of the total variability in the CRCM score is explained by satisfaction as indicated by the low correlations of grades with the OS score and the twelve scale



variables. This was true for all groups compared. The highest correlation was for the OS indicator, and ranged between .11 - .13 for males and females without disabilities, with a slightly higher value for females with disabilities (.21). The OS was not significantly correlated to grades for males with disabilities.

When the average grades for high and low levels of satisfaction (OS) were compared, there were significant differences for three of the four groups. Although similar in magnitude to the difference for males without disabilities, the difference for males with disabilities was not significant. The differences in grades for high and low levels of satisfaction were larger for females than males. Differences ranged between 1.82 and 3.39.

The data did not support the hypothesis that satisfaction with *Instructional Effectiveness* (IE) would be the strongest predictor of academic performance. The global satisfaction variable (OS) was more strongly correlated with the CRCM. In fact, none of the variables we tested were strong discriminators between those with high and low CRCM scores, as demonstrated by comparing areas under the ROC curves (all less than 0.60 and rated as fail) and the low Nagelkerke  $R^2$  values (all under .03). When the scale variables were tested, the IE scale variable did not enter the model for males. The IE variable did enter for females, and had the highest Wald statistic. The scale variables operating together had the strongest association with the CRCM as measured by the Nagkerke  $R^2$ , but even this model had areas under the curve that were below .59 and, therefore, rated a fail on the criteria we used for evaluating AUCs. In addition, some of the scales had odds ratios that were not in the direction expected.

## **9 Satisfaction, Grades and Retention – Pre–university Programs**

Since the retention characteristics of two and three year programs are likely to be different, we analysed the relationship between satisfaction and retention in pre-university (two-year) programs which provided a large enough sample size to make retention analysis meaningful. We included in the sample only those students whom we could follow-up in a subsequent semester. For students enrolled in the spring of 2009, and who responded to the SSI in that year, the enrollment data for the following autumn semester was not available,

so they were excluded from the retention analysis. The breakdown of the pre-university sample by sex and disability is shown in Table 23. Using logistic regression modeling we examined how well the overall satisfaction (OS) variable was able to discriminate between those who were retained and those who left their studies using the same metrics utilized in the grades analysis. The binary variable was: Retained = 1; Not retained = 0.

**Table 23. Students in Pre-university Programs by Sex and Disability.**

<b>Disability Status</b>	<b>Females</b>	<b>Males</b>	<b>Total</b>
No Disabilities	1960 63%	1164 37%	3124 100%
With Disabilities	123 57%	91 43%	214 100%
Total	2083 62%	1255 38%	3338 100%

### 9.1 Overall Satisfaction (OS) and Retention

The relationship between retention and each level of the OS variable for males and females (with and without disabilities combined) is shown in Figure 37. A one-way ANOVA with retention as the dependent and OS as the independent variable, showed that there was a significant relationship between the level of overall satisfaction and retention for both sexes. Details relating to the test are shown in Table 24.

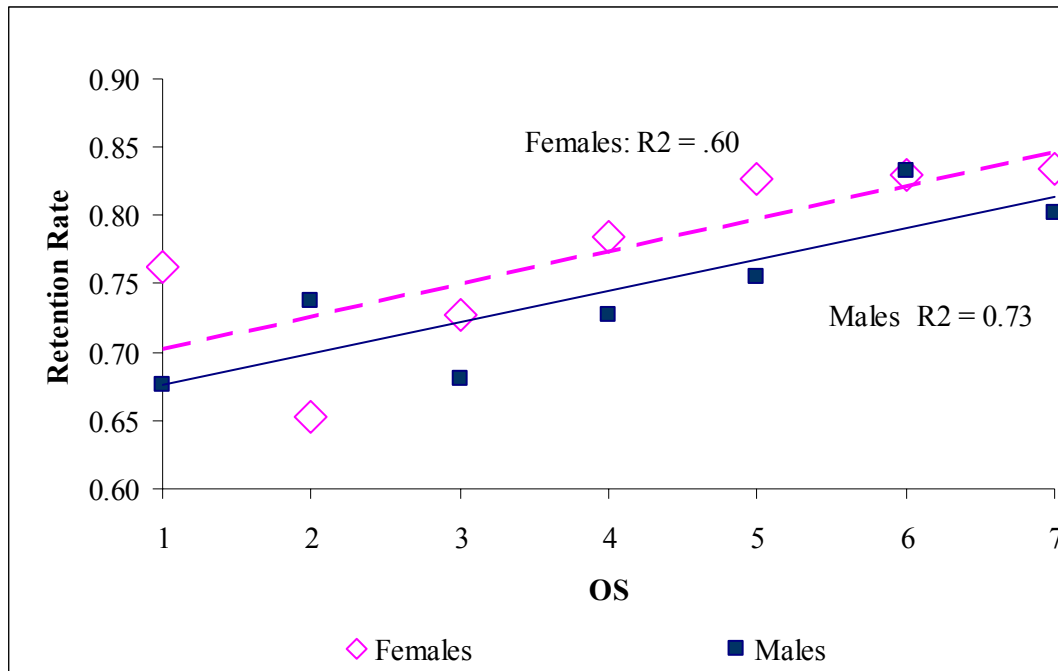
**Table 24. Results of ANOVA – Overall Satisfaction (OS) and Retention Rate (With and Without Disabilities Combined).**

Sex	N	df1	df2	F	Sig
Females	2021	6	2014	3.18	0.004
Males	1221	6	1214	3.23	0.004

*Students with disabilities are included in the sample.*

A visual examination of Figure 37 suggests a linear relationship between retention and overall satisfaction, at least between three and five on the OS scale. However, the trend tends to flatten at satisfaction scores above five and below three.

**Figure 37. Overall Satisfaction and Retention Rate by Sex.**

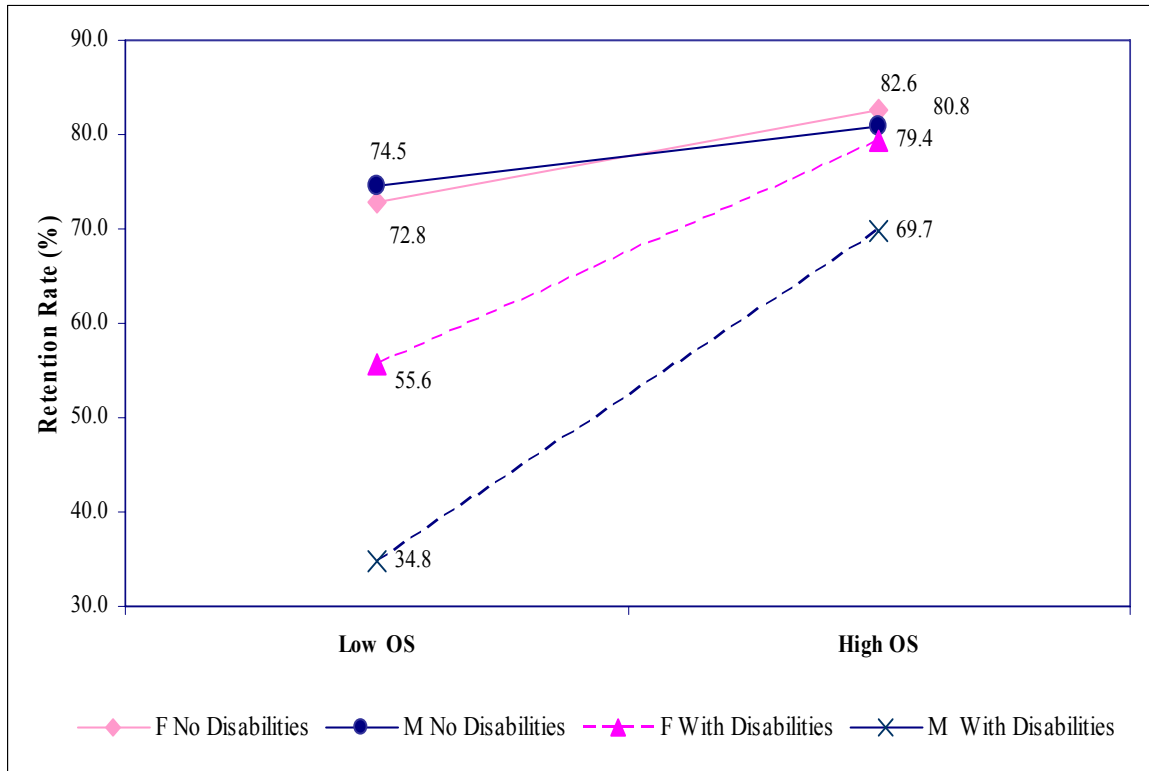


This seems to suggest that once a certain level of satisfaction is reached, there is no further improvement in the retention rate. The retention rates were, on average, approximately 10% higher for students who were most satisfied compared to those who were least satisfied.

Because of the small numbers of students with disabilities, and the relatively low numbers in the overall satisfaction range between one and three, we combined the numbers in this range and compared, using one-way ANOVA, the average retention rates for this group with the group of students who scored between four and seven on the OS scale. The group with scores of between one and three on the OS scale was referred to as 'Low' (N = 379) and the group with scores of four to seven was referred to as 'High' (N = 2863). The ANOVA was significant for females and males with disabilities as well as females without disabilities. The 6.2% difference in retention rate for males without disabilities was not significant at  $p < .05$  but was close to significance ( $p = .07$ ). The outcomes of the ANOVA's are shown in Table 25. Differences in retention rates between students in the Low and High satisfaction groups are shown in Figure 38. The differences averaged 8.4%

for students without disabilities (Females = 9.8%; Males = 6.2%) and 31.7% for students with disabilities (Females = 23.8%; Males = 34.9%). The slopes of the lines were greater for males and females with disabilities compared to their non-disabled peers.

**Figure 38. Low and High Satisfaction Scores and Retention Rates by Sex and Disability (Pre-university Programs).**



**Table 25. Outcomes of ANOVA Comparing Average Retention Rates for Low (1 – 3) and High (4 -7) Levels of Overall Satisfaction.**

Group Compared	N	df1	df2	F	p
Females No Disabilities	1901	1	1899	10.47	<.001
Females With Disabilities	120	1	118	4.86	0.029
Males No Disabilities	1132	1	1130	3.39	0.066
Males With Disabilities	89	1	87	9.44	0.003

When we used the CRCM as a covariate with OS, there was no longer a significant relationship between OS and retention, except for males with disabilities. Since the retention rates increase as both grades and satisfaction increase, it could be argued that the reason why students are satisfied is because they obtained good grades, and it was grades that were linked to the higher retention rates. However, for at least one group (males with disabilities), satisfaction made a contribution to retention independent of the grades received by students. Table 26 shows the outcome of the ANOVAs and compares the F and p values for the four groups of students with and without the inclusion of CRCM as a covariate with the overall satisfaction (OS) variable.

**Table 26. Outcome of ANOVAs Comparing Mean Retention by Overall Satisfaction (OS) With and Without Grades (CRCM) as a Covariate (OS is used as a binary variable).**

<b>Group Compared</b>	<b>N</b>	<b>Without Covariate</b>		<b>With Covariate</b>	
		<b>F</b>	<b>Sig.</b>	<b>F</b>	<b>Sig.</b>
Females No Disabilities	1901	10.47	0.001	1.31	0.252
Males No Disabilities	1132	3.39	0.066	0.13	0.716
Females With Disabilities	120	4.86	0.029	1.32	0.252
Males With Disabilities	89	9.44	0.003	11.46	0.001

## 9.2 Satisfaction and Retention - Regression Analysis.

When the OS variable was entered into a logistic regression model using retention/attrition as the binary variable, the results were significant for both males and females with and without disabilities. However, the strength of association between the two variables (Nagelkerke  $R^2$ ) and the AUCs were higher for females and males with disabilities (than for their non-disabled counterparts (Table 27). The Nagelkerke  $R^2$  was low for all groups, with the highest value of .12 being for males with disabilities.

**Table 27. Outcome of the Logistic Regression by Disability and Sex (Pre-University Programs) With Retention / Attrition as the Binary Variable.**

(Overall Satisfaction was treated as continuous with values from 1 – 7).

Disability	Sex	N	Variable	B	S.E.	Wald	df	Sig.	Exp(B)	Nagelkerke R <sup>2</sup>	AUC	*p	Rate AUC
No Disabilities	F	1901	Overall Satisfaction	0.132	0.043	9.50	1	0.002	1.140	.008	0.539	0.023	Fail
			Constant	0.784	0.239	10.80	1	0.001	2.190				
		1797	Secondary V	0.100	0.010	100.06	1	<.001	1.105	.102	0.696	<.001	Poor
			Constant	-6.113	0.759	64.91	1	<.001	0.002				
		1960	CRCM	0.352	0.026	177.85	1	<.001	1.421	.655	0.932	<.001	Excellent
			Constant	-6.326	0.613	106.65	1	<.001	0.002				
	M	1132	Overall Satisfaction	0.108	0.047	5.20	1	0.023	1.110	.007	0.545	0.035	Fail
			Constant	0.807	0.258	9.83	1	0.002	2.240				
		1058	Secondary V	0.115	0.013	76.02	1	<.001	1.121	.131	0.709	<.001	Fair
			Constant	-7.224	0.981	54.24	1	<.001	0.001				
		1164	CRCM	0.292	0.026	128.00	1	<.001	1.339	.660	0.935	<.001	Excellent
			Constant	-4.783	0.590	65.63	1	<.001	0.008				
With Disabilities	F	120	Overall Satisfaction	0.315	0.138	5.21	1	0.023	1.370	.064	0.644	0.023	Poor
			Constant	-0.524	0.742	0.50	1	0.480	0.590				
		109	Secondary V	0.036	0.037	0.95	1	0.329	1.036	.014	0.512	0.857	Fail
			Constant	-1.500	2.774	0.29	1	0.589	0.223				
		123	CRCM	0.323	0.091	12.47	1	<.001	1.381	.526	0.855	<.001	Good
			Constant	-6.036	2.121	8.10	1	0.004	0.002				
	M	89	Overall Satisfaction	0.347	0.124	7.89	1	0.005	1.420	.124	0.687	0.003	Poor
			Constant	-1.225	0.628	3.80	1	0.051	0.290				
		81	Secondary V	0.086	0.035	6.11	1	0.013	1.089	.112	0.673	0.010	Poor
			Constant	-5.750	2.532	5.16	1	0.023	0.003				
		91	CRCM	0.156	0.038	17.21	1	0.000	1.168	.422	0.855	<.001	Good
			Constant	-2.685	0.853	9.91	1	0.002	0.068				

\* p – test of null hypothesis that the AUC = 0.50.

Although the areas under the ROC were significantly different from 0.50 for all groups, the AUC rated as ‘Poor’ for students with disabilities and ‘Fail’ for students without disabilities. The ROC curves for the four groups are shown in Figure 39.

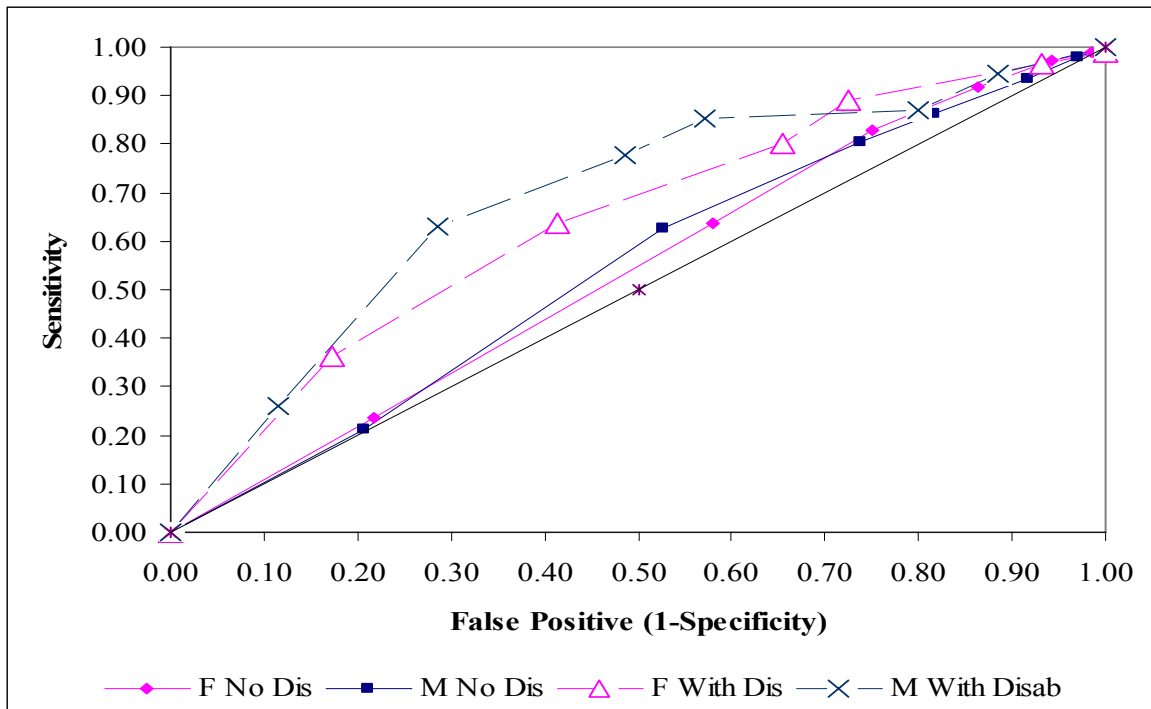
To put these areas in perspective, it is useful to compare these areas with the areas generated by the high school grades (Secondary V averages). In our previous study (Jorgensen, Fichten & Havel, 2009), of the variables we tested, the high school grade proved to be the strongest predictor of whether a student in college for the first time, would be retained to the third and tenth semester. However, males and females with disabilities proved to be exceptions, and this also proved to be the case here. The OS variable proved to be a better predictor than the high school grade for females with disabilities, and as good a predictor for males with disabilities (Table 27). The differences can be seen by examining the ROC curves plotted in Figure 39, which shows the OS variable and its ability to discriminate between those retained and those not retained for males and females with and without disabilities. Figure 39 demonstrates the steeper AUCs for males and females with disabilities, and thus the superiority of the models in discriminating between those who left and those who were retained. Figure 39 uses the high school grades in the model, and shows a flat curve for females with disabilities. Table 27 summarizes the results for the different variables and groups.

### **9.3 Grades and Retention Rates**

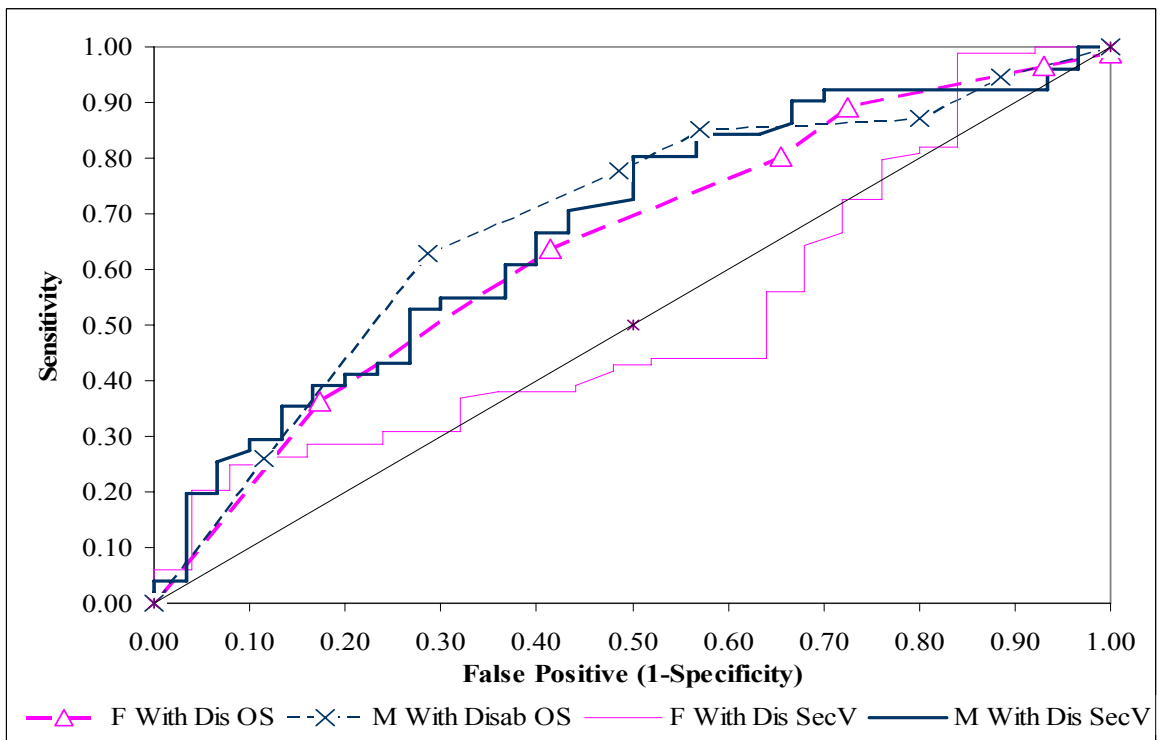
When the CRCM variable was added to the logistic regression model with the OS variable, the OS variable was no longer significant except for males with disabilities. For males with disabilities the AUC increased from .855 to .863 and the Nagelkerke  $R^2$  from .422 to .499. Overall satisfaction added significantly to the model for males with disabilities only.

The CRCM alone generated AUC curves with areas of .855 for females and males with disabilities and .932 and .935 for females and males without disabilities respectively. These AUCs rated as good or excellent.

**Figure 39. ROC Curves – Overall Satisfaction and Retention by Sex and Disability.**



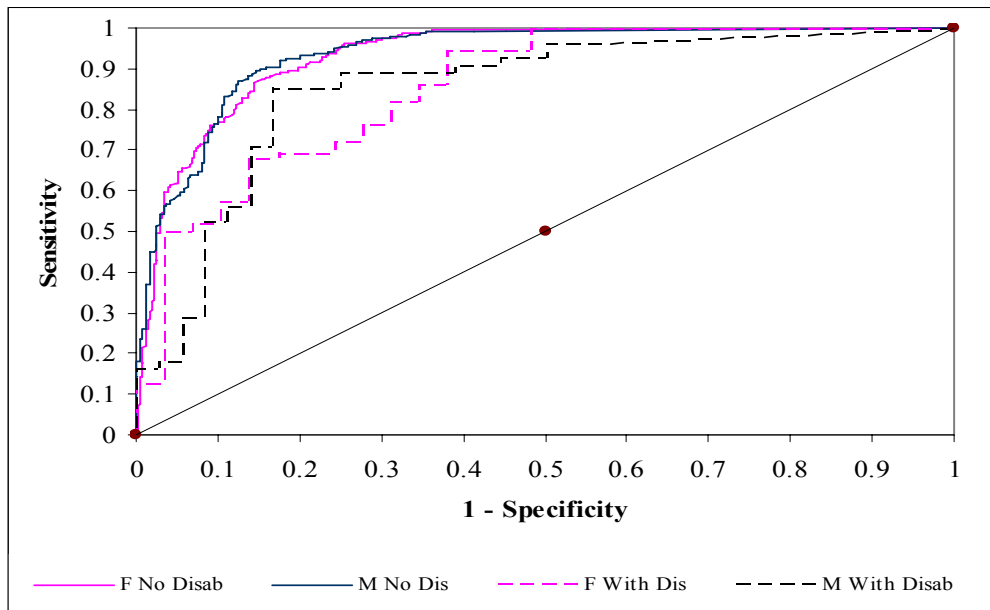
**Figure 40. ROC Curves Comparing Overall Satisfaction and High School Average As Discriminators – Males and Females With Disabilities.**





There were no sex differences in the AUCs for either group (Figure 41). The CRCM proved to be a good to excellent discriminator of whether a student was retained, and satisfaction (OS) did not add to this appreciably. The results are summarized in Table 27.

**Figure 41. Outcome of Logistic Regression – AUC’s Generated Entering Grades (CRCM) as the Variable (by Sex and Disability).**



#### 9.4 Summary Retention, Overall Satisfaction (OS) and Grades

Students who were more satisfied tended to have higher retention rates. Between those with the lowest and highest overall satisfaction, the difference in retention rate averaged about 10%. Even though there was a significant association between retention and Overall Satisfaction (OS), except for males with disabilities, this difference disappeared when grades were used as a covariate in the model. Thus it was difficult to tell whether it was higher grades or higher satisfaction that led to higher retention. For males with disabilities both satisfaction and grades made separate contributions, although in the logistic regression grades dominated. However, even here the changes were small with OS adding little to the ability to discriminate between the two groups once grades were taken into consideration.

The CRCM alone produced models with AUCs that rated excellent for males and females without disabilities (>.90) and good (.80 - .90) for males and females with disabilities. The OS indicator alone, produced models rated as fail (AUC .50 - .60) for students without disabilities, and poor for students with disabilities (.60 - .70). However, the OS variable proved to be an equal or better predictor than the high school grades (Secondary V averages) for males and females with disabilities. The OS variable, although a weak predictor, was better able to discriminate between those who were and were not retained for students with disabilities, compared to those without.

## **10 Importance – Sex and Disability Comparison**

### *Overview - Importance*

Our hypotheses with respect to importance were as follows:

*a) Males and females will differ in what they believe are important aspects of the college experience*

*b) Students with and without disabilities will not differ in what they believe are important aspects of the college experience.*

In order to test these hypotheses we compared the eleven importance scales for five groups 1) Study sample – total; 2) Study sample - females and males with disabilities; 3) Study sample females and males without disabilities; 4) Canadian two-year Colleges and 5) US Community Colleges. Groups two and three are subsamples of our study group. Groups 4 and 5 are based on data sets obtained from Noel-Levitz. As the *Responsiveness to Diverse Populations* scale did not have an importance score, there were only eleven importance scales as opposed to the twelve scales used in the satisfaction analyses. For this analysis, our study sample consisted of all students in diploma programs.

### **10.1 SSI Importance Scales by Sex**

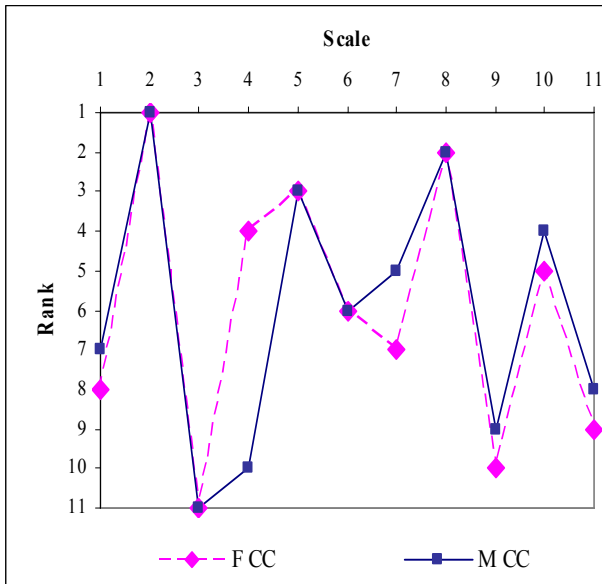
As was the case with satisfaction, males generally tended to score importance items lower than females for all groups compared. The average difference between males and females

on importance scores for the eleven scales was 0.30 for our sample and the Canadian two-year sample, and 0.40 for the Community College sample. Because of this tendency of males to score importance items lower than females, we used rankings to compare the relative importance of the scales – where one represented the scale with the highest, and eleven the scale with the lowest average importance. Figures 42 - 45 show the scale rank on the Y axis plotted against the eleven scales shown on the X axis for the groups indicated, and Table 28 lists the scales ranking highest and lowest in importance for each of the groups. The total study sample was not plotted as it reflected the group without disabilities.

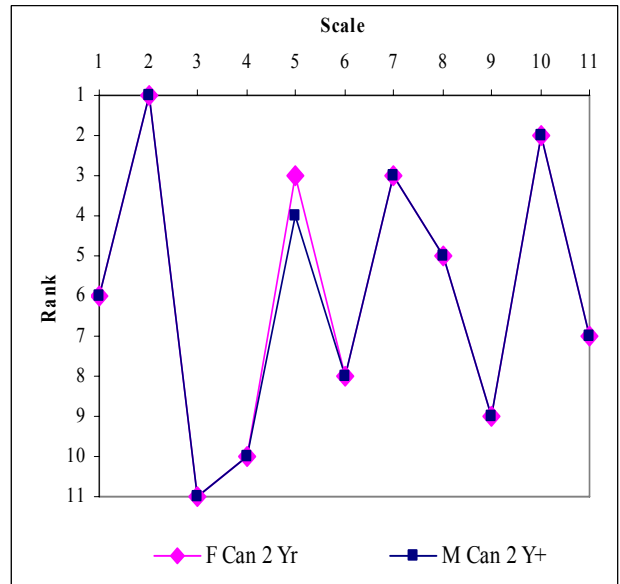
There was remarkable consistency in the scales that ranked as most important for males and females within groups. Table 28 shows the two scales that were most important and the two that ranked lowest for males and females for each of the five groups. *Instructional Effectiveness* ranked as most important for all groups. There were only three scales (in two groups) where rankings differed between the sexes by more than two. Community College females ranked *Safety and Security* higher than males by six places. Males with disabilities ranked *Campus Support Services* four places higher, and *Admissions and Financial Aid* five places lower than females with disabilities.

The correlations between the average importance scale scores for females and males for the five groups are compared in Table 29. All correlations were above 0.92 and highly significant. Figure 46 plots the average scale scores of females against those of males, and illustrates the strong correlation of the scores between sexes for all groups compared. The total study sample line overlapped with the ‘no disabilities’ sub-sample, so it is not shown on the graph.

**Figure 42. Importance - Community Colleges.**

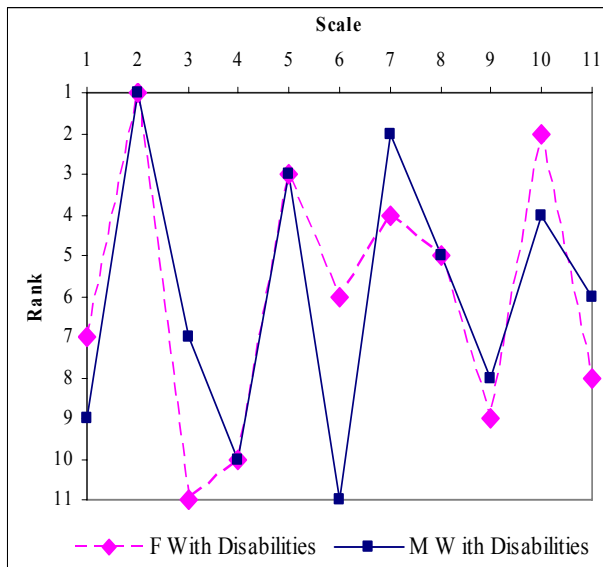


**Figure 43. Importance - Canadian 2 Year Colleges.**



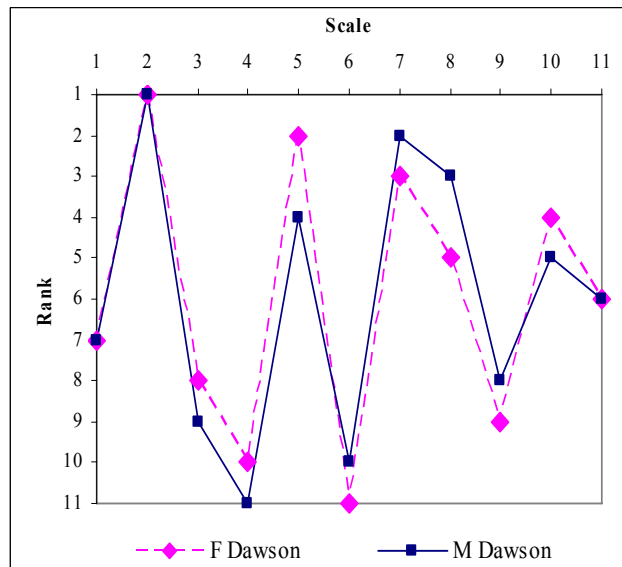
**Figure 44. Importance - With Disabilities.**

*(Females N = 220; Males: N = 174)*



**Figure 45. Importance - Without Disabilities.**

*(Females: N = 3479; Males: N = 2192)*



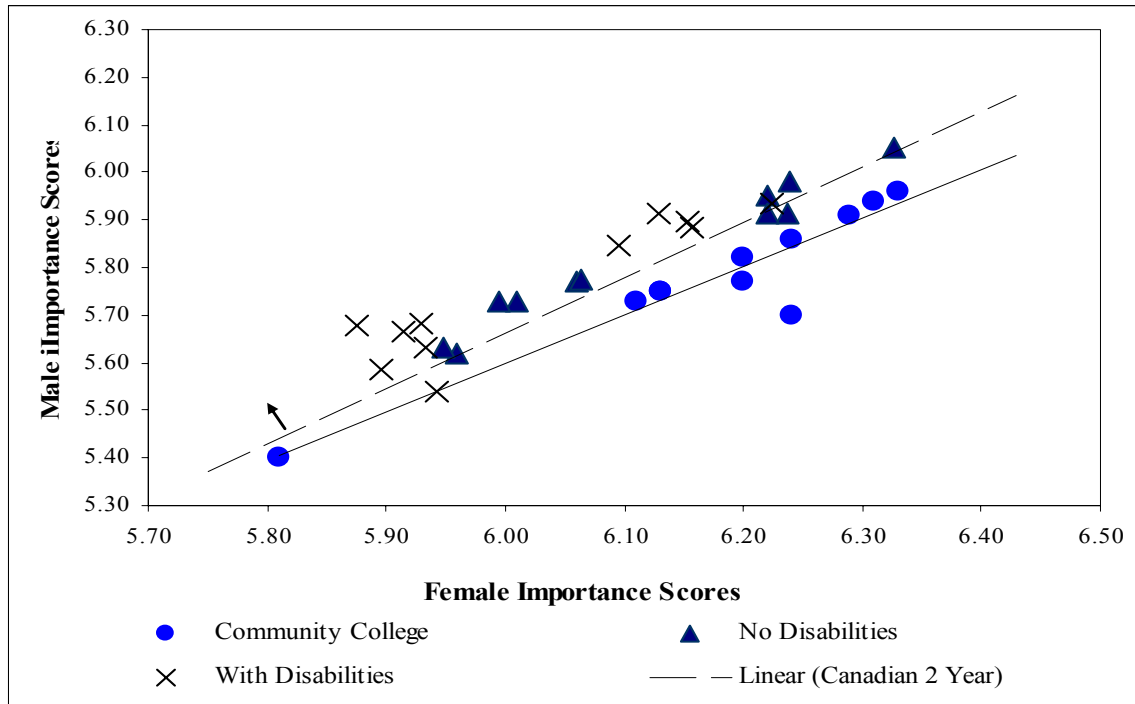
**Table 28. Highest and Lowest Ranking Importance Scales For Females and Males by Group.**

	<b>Rank Importance</b>	<b>Females</b>	<b>Males</b>
Study Group	1	<b>Instructional Effectiveness</b>	<b>Instructional Effectiveness</b>
	2	Academic Services, Academic Advising/Counseling	Academic Services
	10	Safety and Security	Admissions and Financial Aid
	11	Admissions and Financial Aid	Safety and Security
With Disabilities	1	<b>Instructional Effectiveness</b>	<b>Instructional Effectiveness</b>
	2	Concern for the Individual	Academic Services
	10	Safety and Security	Safety and Security
	11	Campus Support Services	Admissions and Financial Aid
Without Disabilities	1	<b>Instructional Effectiveness</b>	<b>Instructional Effectiveness</b>
	2	Academic Services; Academic Advising/Counseling	Academic Services
	10	Safety and Security	Admissions and Financial Aid
	11	Admissions and Financial Aid	Safety and Security
Two-Year Canadian	1	<b>Instructional Effectiveness</b>	<b>Instructional Effectiveness</b>
	2	Concern for the Individual	Concern for the Individual
	10	Safety and Security	Safety and Security
	11	Campus Support Services	Campus Support Services
Community College	1	<b>Instructional Effectiveness</b>	<b>Instructional Effectiveness</b>
	2	Registration Effectiveness	Registration Effectiveness
	10	Service Excellence	Safety and Security
	11	Campus Support Services	Campus Support Services

**Table 29. Correlation Between Male and Female Averages for the Eleven Importance Scales. (*N* = 11 Scales).**

Group	Correlation (R)	p
Study Sample Group	.985	<.001
Without Disabilities	.985	<.001
With Disabilities	.927	<.001
Canadian Two - Year	.979	<.001
Community College	.947	<.001

**Figure 46. Correlation Between Female and Male Scores on Eleven SSI Importance Scales.**



## 10.2 SSI Importance Scales - by Disability

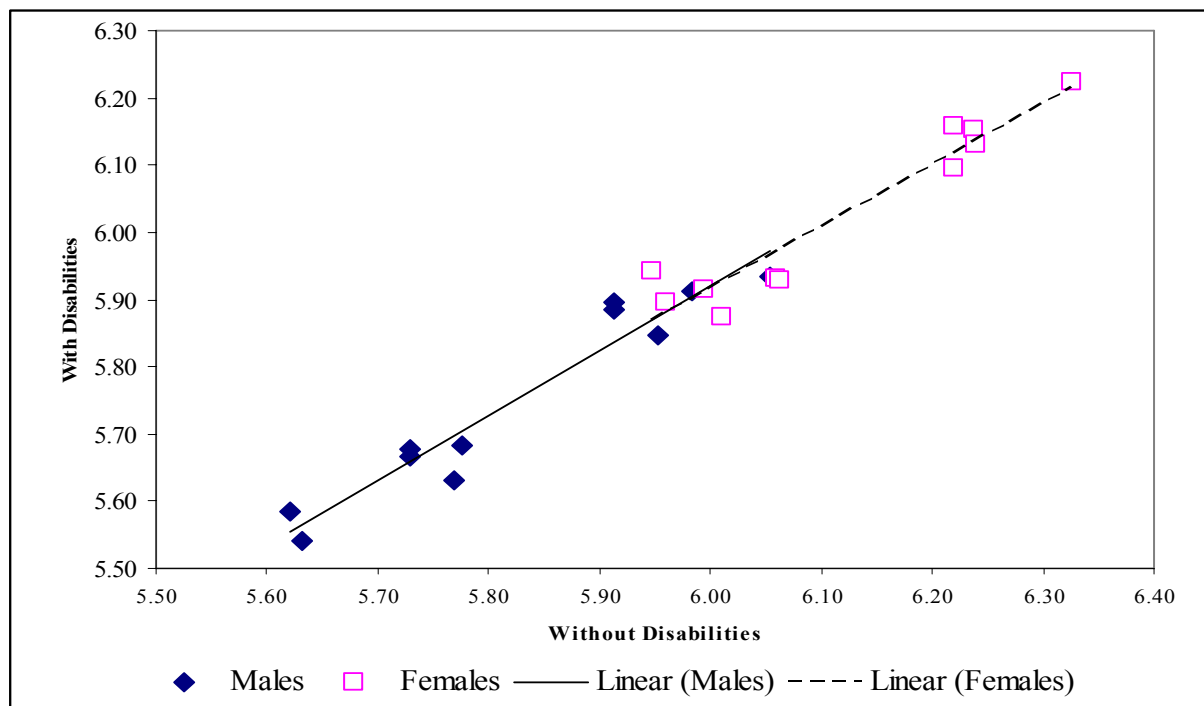
Our hypothesis that students with and without disabilities would not differ in what they considered important was supported. There was a high correlation of the eleven importance scores for both males and females with and without disabilities (Table 30). This can be seen from Figure 47 where the eleven importance scale scores for males and females

without disabilities are shown on the x axis, and scores for males and female with disabilities are shown on the y axis. The female scores cluster at the higher ends of the scales, illustrating the tendency for females to score the importance items higher than males

**Table 30. Correlation of Eleven Importance Scores for Males and Females With and Without Disabilities.**

Group	Correlation	p
Males: No Disabilities/With Disabilities	0.964	<.001
Females: No Disabilities/With Disabilities	0.956	<.001

**Figure: 47. Correlation Between Students With and Without Disabilities on the Eleven Importance Scales.**



### 10.3 Summary – SSI Importance Scales

Our hypothesis that males and females will differ on the aspects of their college experience that are important was not supported. There was a strong correlation between male and

female scores on the eleven importance scales, and this was true for both students with and without disabilities. However, one obvious difference between the sexes was the relatively higher importance assigned to *Safety and Security* by females in the Community College sample. In addition, males with disabilities ranked *Campus Support Services* four places higher and *Admissions and Financial Aid* five places lower than females with disabilities. All five groups ranked *Instructional Effectiveness* highest in importance.

Our hypothesis that students with and without disabilities will not differ in what they believe are important aspects of the college experience was supported. The relative importance of the scale items for students with disabilities in our study sample correlated strongly with those of students without disabilities, and this was true for both sexes.

## **11 Performance Gap and Retention Rates**

The difference between importance and satisfaction is defined by Noel-Levitz as a ‘performance gap’ (Noel-Levitz - Satisfaction-Priorities Surveys Interpretive Guide). According to Noel-Levitz, the larger the performance gap, the larger the discrepancy between student expectations and their level of satisfaction with the situation as it currently stands. The performance gap (ie importance minus satisfaction) can be positive, negative or there will be no difference. When the difference is negative (i.e. the satisfaction score is higher than the importance score) then students’ expectations have been exceeded. When importance exceeds satisfaction, and the gap is positive, then the closer the gap scores are to zero the closer the institution is to meeting students’ expectations. Large positive differences may be of concern, especially for areas that are of high importance.

### *Hypothesis related to gap scores*

Our hypothesis was that students with the largest gap between the aspects of college life they consider important, and their satisfaction with the extent to which they believe the college meets their expectations in this area, will have the lowest retention rates.

In order to test this hypothesis, we calculated the difference between the importance and satisfaction scores for each student in our sample for the eleven scales for which both



importance and satisfaction scores were available. We then calculated the average performance gap for each scale. We compared the correlation coefficients of each of the eleven gap scores with the retention rate variable. To get a measure of the actual difference in retention rates for various gap sizes we plotted the retention rate for those who fell within certain gap ranges. We then ran a logistic regression to test the ability of the gap scores to discriminate between those who dropped out and those who were retained.

Because we ran retention rate models, only students in pre-university programs were included for survey years prior to 2009, and the sample breakdown by sex and disability can be found in Table 23.

### 11.1 Performance Gap Sizes by Sex and Disability

The average gap sizes by sex and disability for each of the eleven scales are shown in Table 31.

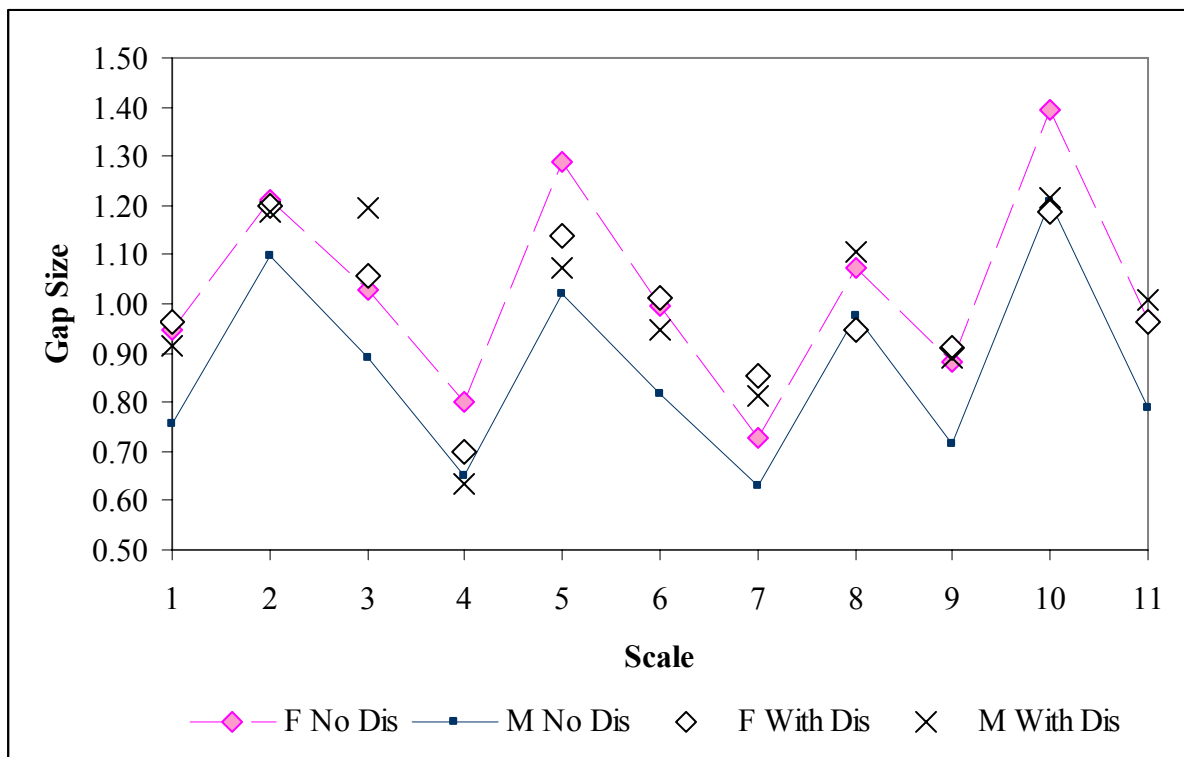
**Table 31. Performance Gaps by Scale, Sex and Disability.** (*F = Females; M = Males, The three highest gap scores for each group are highlighted.*)

	<b>Scale</b>	<b>F No Disabilities</b>	<b>M No Disabilities</b>	<b>F With Disabilities</b>	<b>M With Disabilities</b>
1	Student Centeredness	0.95	0.76	0.96	0.92
2	Instructional Effectiveness	<b>1.21</b>	<b>1.10</b>	<b>1.20</b>	<b>1.19</b>
3	Campus Support Services	1.03	0.89	1.06	<b>1.20</b>
4	Safety and Security	0.80	0.65	0.70	0.63
5	Academic Advising/Counseling	<b>1.29</b>	<b>1.02</b>	<b>1.14</b>	1.07
6	Admissions and Financial Aid	1.00	0.82	1.01	0.95
7	Academic Services	0.73	0.63	0.86	0.81
8	Registration Effectiveness	1.07	0.98	0.95	1.11
9	Service Excellence	0.88	0.71	0.91	0.89
10	Concern for the Individual	<b>1.40</b>	<b>1.21</b>	<b>1.19</b>	<b>1.21</b>
11	Campus Climate	0.97	0.79	0.96	1.01
	<b>Average</b>	<b>1.03</b>	<b>0.87</b>	<b>0.99</b>	<b>1.00</b>

*F No Disabilities N = 1856 – 1953; M No Disabilities N = 1103 – 1157; F With Disabilities N = 115 - 120; M With Disabilities N = 115 - 120; M With Disabilities N = 85 – 89.*

The scales that had the largest and smallest gaps tended to be consistent across sex and disability, with the exception being the *Campus Support Services* scale which had one of the highest gaps for males with disabilities, but not the other groups. There was a high degree of correlation of the gap scores among the four study groups (males and females with and without disabilities). This is evident from Figure 48, which plots the gap sizes for each scale for males and females with and without disabilities. The correlation coefficients among the groups for the eleven scales ranged between .81 and .97 and are shown in Table 32.

**Figure 48. Performance Gap Sizes by Scale and Study Group.** (Scale Descriptions Are Listed in Table 31 )



**Table 32. Correlations of Average Scale Gap Sizes: Males and Females With and Without Disabilities.** (*N* = 11 Scales).

<b>Group</b>	<b>Sig</b>	<b>F No Disabilities</b>	<b>M No Disabilities</b>	<b>F With Disabilities</b>	<b>M With Disabilities</b>
F No Disabilities	Correlation	1	0.969	0.895	0.812
	Sig. (2-tailed)		0.000	0.000	0.002
	N	11	11	11	11
M No Disabilities	Correlation	0.969	1	0.885	0.865
	Sig. (2-tailed)	0.000		0.000	0.001
	N	11	11	11	11
F With Disabilities	Correlation	0.895	0.885	1	0.903
	Sig. (2-tailed)	0.000	0.000		0.000
	N	11	11	11	11
M With Disabilities	Correlation	0.812	0.865	0.903	1
	Sig. (2-tailed)	0.002	0.001	0.000	
	N	11	11	11	11

Despite the high correlation, a MANOVA revealed that gap scores for males without disabilities were significantly lower than those of their female counterparts (Wilk's  $\lambda = 0.42$ ,  $F(11, 2878) = 362.66$   $p < .001$ ). Post hoc tests indicated significant differences between sexes for all eleven scales. From Figure 48 it can be seen that the plot of gap sizes for males without disabilities lies below that of the other three groups. The average difference in gap size between the sexes was lower for males by 0.16.

The differences between the sexes remained statistically significant when the CRCM (which tended to be lower for males) was used as a covariate. The average difference in gap size was 0.01 for males and females with disabilities, and the MANOVA comparing mean gap scores was not statistically significant.

The tendency for male gap sizes to be lower than those of females, at least for the sample without disabilities, was consistent with the Canadian two-year and Community College samples. The average difference in gap size for the eleven scales for the Canadian two-year sample was 0.18 lower for males and for the Community College sample the male gap scores were, on average, 0.28 lower. As was the case with our sample, the eleven scale scores of males and females were highly correlated for both groups (Table 33).

**Table 33. Correlation of Gap Scores Between Males and Females.**

*(Calculated from data provided by Noel-Levitz).*

<b>Group</b>	<b>Correlation</b>	<b>p</b>
Community College (F & M)	0.948	<.001
Two-Year Canadian (F & M)	0.892	<.001

## **11.2 Correlation of Gap Size With Retention**

The correlation coefficients and significance values for gap scores and retention rates for all eleven scales can be found in Appendix.10. For the scales showing statistical significance all correlations were in the direction anticipated – ie there was an inverse correlation between gap size and retention so that larger gap sizes were associated with lower retention.

### *Females and Males Without Disabilities*

For females without disabilities there were weak but significant inverse correlations between retention rates and performance gaps for three of the eleven scales (*Student Centeredness, Instructional Effectiveness, Registration Effectiveness*). However, the correlation coefficients were low (range -.05 to -.06).

Four of the gap scores showed correlations that were statistically significant for males without disabilities (*Campus Support Services, Academic Advising/Counselling, Admissions and Financial Aid, Registration Effectiveness*). As was the case for females, correlation coefficients were low and ranged from -.06 to .08.

### *Females and Males With Disabilities*

There were no significant correlations of gap scores with retention for males with disabilities, and only one gap score had a significant correlation for females with disabilities (*Safety and Security, r = -.19*).

### 11.3 Retention and Gap Size - Students Without Disabilities

To get a sense of the actual differences in retention rates by performance gap, we plotted the retention rates against the gap sizes. We coded the gaps into five groupings, with the ranges shown in Table 34. We chose the *Instructional Effectiveness* scale as it had the single highest correlation with retention for females ( $r = .06$ ) and was the scale that was most important for all groups, and the *Admissions and Financial Aid* scale as it had the single highest correlation for males ( $r = .08$ ). The single largest number of scores fell in Group 2 (gap size between 0 and 1) for both of these variables.

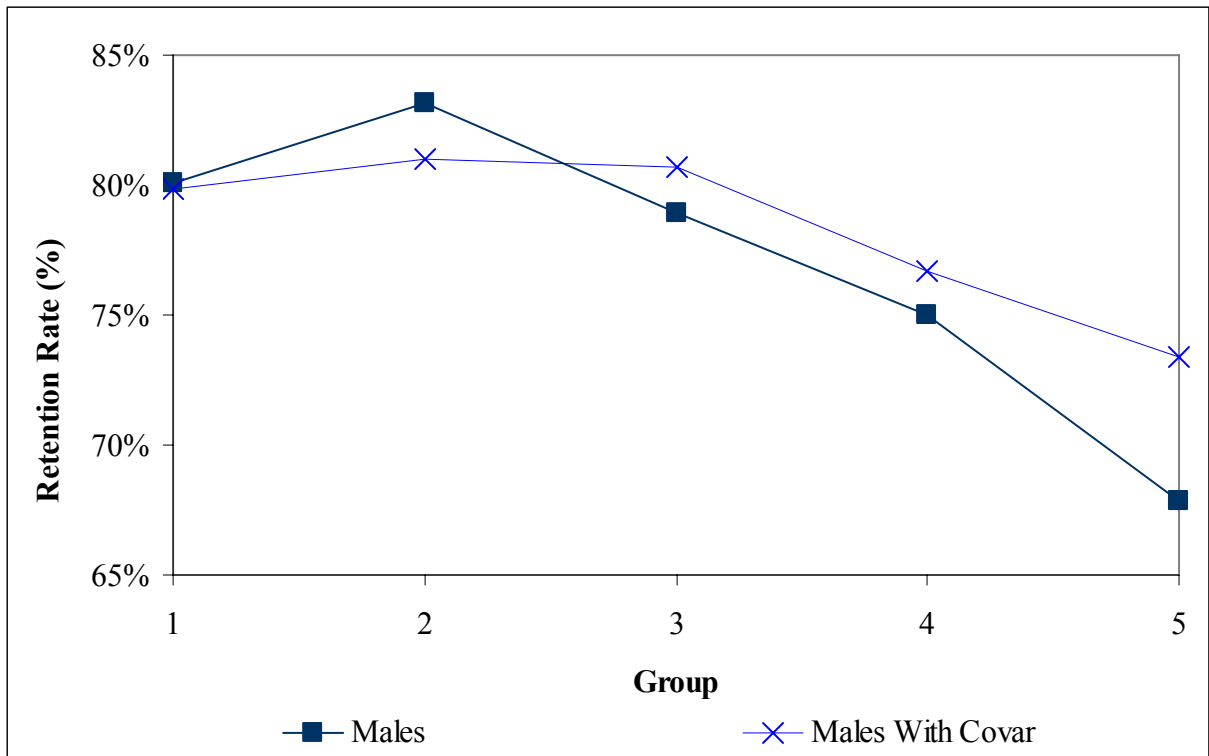
**Table 34. Distribution of Gap Scores for the Instructional Effectiveness (IE) and Admissions and Financial Aid (AFA) Scales** (*Students Without Disabilities in Pre-University Programs*).

Group	IE Gap Size	Females			Males		
		N	IE%	AFA%	N	IE%	AFA%
1	$\leq 0$	144	7.5%	20.6%	142	12.3%	29.1%
2	$> 0 \leq 1$	789	40.5%	39.2%	476	41.1%	35.5%
3	$> 1 \leq 2$	669	33.9%	25.2%	343	29.6%	21.9%
4	$> 2 \leq 3$	245	12.7%	10.2%	127	11.0%	8.3%
5	$> 3$	104	5.3%	4.9%	69	6.0%	5.1%
<b>Total</b>		<b>1951</b>	<b>100%</b>	<b>100%</b>	<b>1157</b>	<b>100%</b>	<b>100%</b>

#### *Admissions and Financial Aid*

The average retention rates for gap size groups 1 - 5 are plotted in Figure 49 for the *Admission and Financial Aid* scale. A one-way ANOVA indicate that the difference in retention rate among the five groups was not significant at  $p < .05$  for either males or females. However, it approached significance ( $p = .057$ ) for males, and the post hoc tests showed that Group 5 differed significantly from Groups 1 & 2. When the CRCM score was used as a covariate, the difference was not significant ( $p = .225$ ). However, the post hoc test still showed a difference in retention rate between Group 5 and Group 2. The data suggest that there may be a difference in retention rate, but only for quite large gap sizes. Although using the CRCM as a covariate tends to mitigate this, it does not completely eliminate the difference (Figure 49).

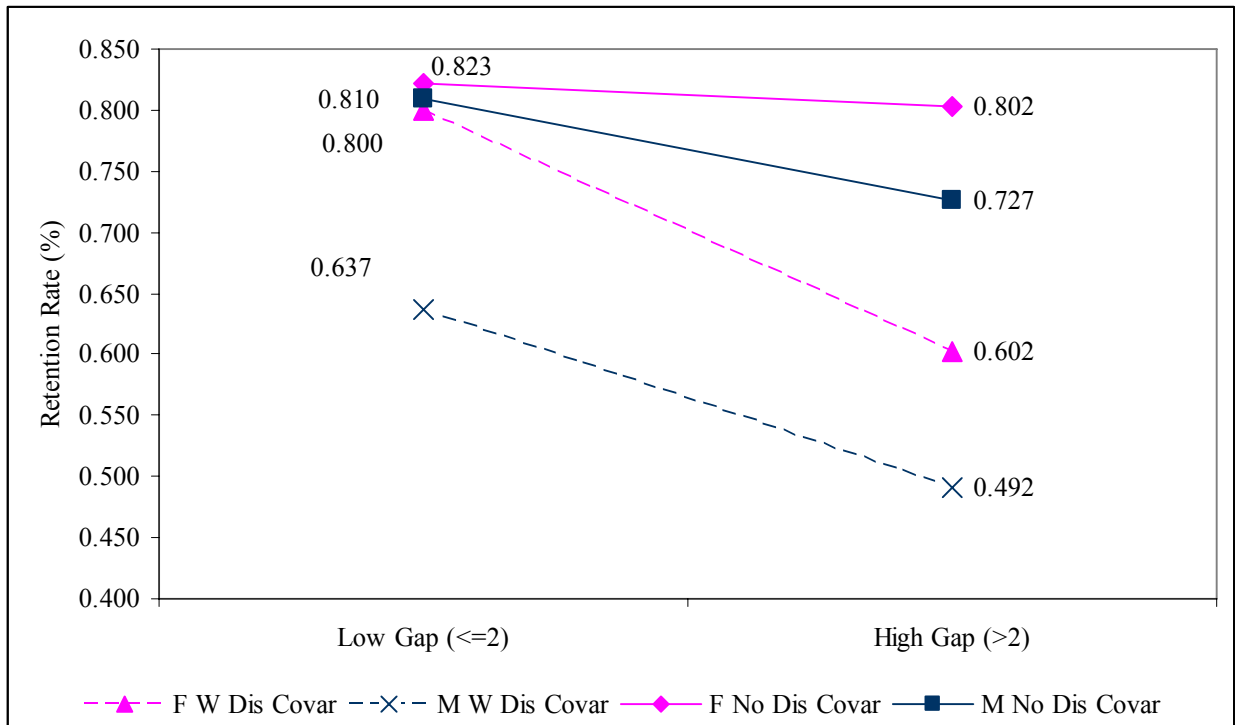
**Figure 49. Admissions and Financial Aid – Retention Rate By Gap Size With and Without Grades (CRCM) Covariate. (Males Without Disabilities; N = 1103).**



To test whether this was the case we compared, using ANOVA, the retention rate for gap sizes of  $\leq 2$  with those of gap sizes  $> 2$ . Figure 50 plots the retention rate for low and high gap sizes for all four groups. Table 35 summarizes the model of the *Admissions and Financial Aid* scale variable with and without the grade covariate.

After using the CRCM as a covariate, the difference in retention rate was significant for males without disabilities as well as for females with disabilities. The steep drop for males with disabilities was not significant, as there were only 15 students in the ‘high gap’ group. Thus, it appears then that gap size for the *Admissions and Financial Aid* scale was related to retention rates, with a difference of 8.3% between high and low gap sizes for males without disabilities, and 19.8% for females with disabilities. The difference of 2.1% for females without disabilities was not significant.

**Figure 50. Admissions and Financial Aid Scale - Retention Rates by Low ( $\leq 2$ ) and High ( $> 2$ ) Gap Sizes by Sex and Disability After Co-varying With Grades (CRCM).**



**Table 35. Admissions and Financial Aid Scale and Retention Rate For High (>2) And Low (<=2) Gap Sizes.**

*(ANOVA - Retention Rate and Gap Size).*

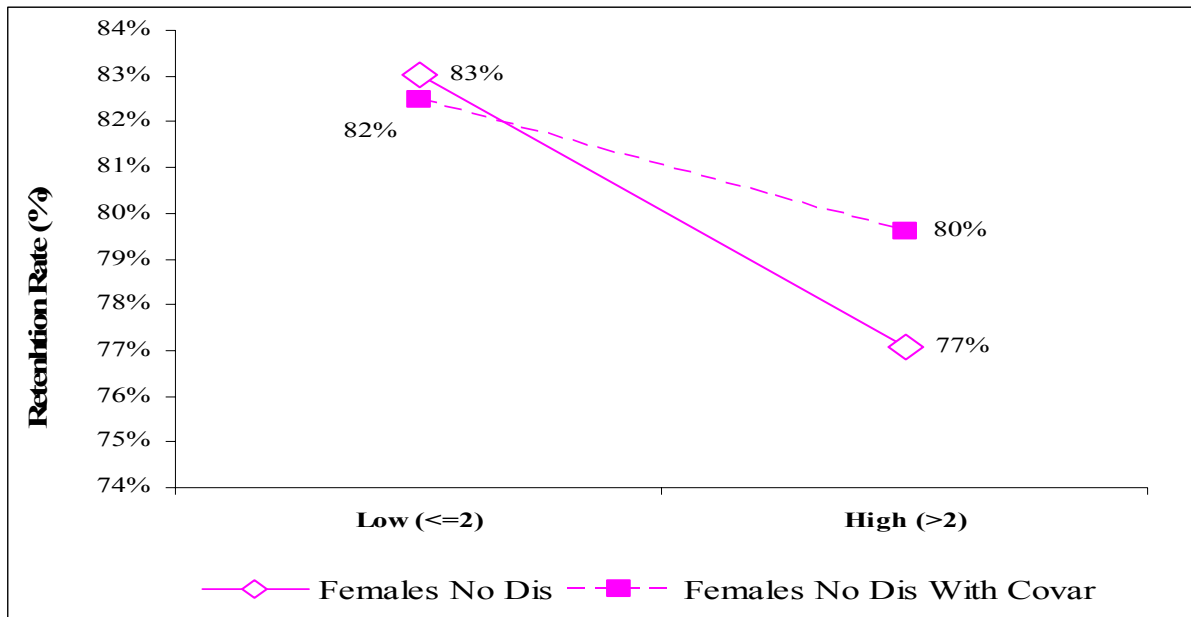
	<b>N</b>	<b>Model</b>	<b>Variables</b>	<b>df</b>	<b>F</b>	<b>Sig.</b>
<b>F No Disabilities</b>	1856	1	Admissions & Financial Aid	1, 1854	1.26	.262
		2	CRCM (Covariate) Admissions & Financial Aid	1, 1853	433.98 0.81	<.001 .367
<b>M No Disabilities</b>	1103	1	Admissions & Financial Aid	1, 1101	6.13	.013
		2	CRCM (Covariate) Admissions & Financial Aid	1, 1100	18.26 4.19	<.001 .010
<b>F With Disabilities</b>	115	1	Admissions & Financial Aid	1, 113	3.73	.056
		2	CRCM (Covariate) Admissions & Financial Aid	1, 112	18.26 4.19	.000 .043
<b>M With Disabilities</b>	85	1	Admissions & Financial Aid	1, 83	0.46	0.498
		2	CRCM (Covariate) Admissions & Financial Aid	1, 82	12.72 1.22	0.001 0.272



### Instructional Effectiveness

We did an analysis for *Instructional Effectiveness (IE)* gap scores using the same methodology as for the *Admissions and Financial Aid* scale. The IE scale gap score correlated with retention for females without disabilities only (Figure 51).

**Figure 51. Retention Rate and Gap Size on the Instructional Effectiveness Scale - Showing Influence of the Grades Covariate (CRCM).**



Although there was a significant difference in retention rates between low and high gap values for this group (5.9%), this difference became non-significant when co-varied with grades. However, the slope of the line was in the same direction, with the difference in retention rates between low and high gap sizes reduced to 2.9%. Females with high gap scores on the IE scale tended to have lower grades (CRCMs). Results of the ANOVA can be found in Appendix 11.

#### 11.4 Logistic Regression and Gap Scores

The logistic regression outcomes using gap scores as the independent variables and retention as the binary variable are shown in Table 36.

**Table 36. Logistic Regression with Scale Gap Values as Independent Variables and Retention as the Binary Variable.**

	<b>Variable (Gap)</b>	<b>B</b>	<b>S.E.</b>	<b>Wald</b>	<b>df</b>	<b>Sig.</b>	<b>Exp(B)</b>	<b>Nagelker ke R<sup>2</sup></b>	<b>AUC</b>	<b>*p</b>	<b>Rate AUC</b>
Females No Disabilities	Student Centeredness	-0.342	0.098	12.188	1	0.000	0.710	0.027	0.586	<.001	Fail
	Instructional Effectiveness	-0.356	0.112	10.157	1	0.001	0.701				
	Registration Effectiveness	-0.194	0.095	4.175	1	0.041	0.824				
	Service Excellence	0.389	0.117	10.981	1	0.001	1.476				
	Concern for the Individual	0.345	0.091	14.509	1	0.000	1.412				
	Constant	1.673	0.104	260.639	1	0.000	5.326				
Males No Disabilities	Constant	1.538	0.096	258.606	1	0.000	4.655	0.013	0.541	0.061	Fail
	Academic Advising / Counseling	-0.170	0.058	8.676	1	0.003	0.843				

\*  $p$  – test of null hypothesis that the AUC = 0.50

The regression models for the scales we tested were only significant for males and females without disabilities. One scale variable entered the model for males (*Academic Advising / Counseling*) and five for females (*Student Centeredness; Instructional Effectiveness; Registration Effectiveness; Service Excellence; Concern for the Individual*). The odds ratios for three of the female variables were less than one, indicating a lowered odds of being retained as gap scores increased, which is in the direction anticipated. However, *Service Excellence* and *Concern for the Individual* scales for females had odds ratios greater than one, indicating a higher odds of being retained as the gap values increased. When the ROC curves were plotted using the probabilities generated by the model, the AUC for males was not significant. Although the area under the curve was significantly different from 0.50 for females, the AUC rated as fail based on our criteria.

### **11.5 Summary - Gap Size and Retention**

The gap scores of males and females were highly correlated. For the scales where the gap sizes did show a correlation with retention rate, the correlations were weak. The scales that showed statistically significant differences depended on sex and disability. For students without disabilities, *Instructional Effectiveness* had the strongest correlation for females and *Admissions and Financial Aid* for males. The only scale showing a significant correlation for students with disabilities was *Safety and Security*, and this for females only. When co-varied with grades, the difference in mean retention between those with low and high gap scores was no longer significant for most scales we tested. Students with larger gap scores tended to have lower grades. However, the *Admissions and Financial Aid* gap variable remained significant for males without disabilities and females with disabilities, even when adjusted for the CRCM.

The difference in retention rates between low and high gap values for the *Admissions and Financial Aid* scale was 8% for males without disabilities, with an even steeper drop for females with disabilities (20%). The drop for males with disabilities, although steep (15%), was not significant as the sample size was small. The difference of 2.1% for females without disabilities was not significant, although the direction of the difference was the same as for the other groups. The *Instructional Effectiveness* scale, which was significantly

correlated with retention for females only, showed a difference in retention of 5.9%, a score which became non-significant when co-varied with grades.

Although some of the scale gap scores were significant in predicting retention when entered into a logistic regression model for students without disabilities, they had only a weak association with the retention variable, and the models rated as ‘fail’ on the criteria we selected for evaluation. The variables entering the model depended on sex. Some of the scale variables had odds ratios greater than one, indicating that as gap size increased the retention rate increased, and this was not in the expected direction.

## **12 Satisfaction and Decision to Enroll Again**

One of the questions on the SSI asks students: *All in all, if you had to do it over, would you enroll here again?* The range of options in reply to the question are: 1) *Definitely not*; 2) *Probably not*; 3) *Maybe not*; 4) *I don’t know*; 5) *Maybe yes*; 6) *Probably yes*; 7) *Definitely yes*. This item can be viewed as an indirect measure of satisfaction, as dissatisfied students are unlikely to respond positively to this question. We used linear regression to determine whether a student’s reply to this question was related to satisfaction using both the OS variable as well as the SSI scale and item variables. This analysis included all students in diploma programs. In order to carry out linear regression for the item variables we had to use mean replacement for the seventy-three variables. For some item variables quite a number of students failed to respond and this, therefore, could have biased the results.

### **12.1 Overall Satisfaction and Decision to Enroll Again**

We found that OS was highly correlated with the question regarding the decision to re-enroll for all four groups, with correlation coefficients ranging from .63 - .73. The amount of variability ( $r^2$ ) accounted for ranged from 40% to 53%, and was approximately 9% - 10% higher for females and males with disabilities compared to their non-disabled peers (Table 37).

**Table 37. Correlations of Decision to Re-enroll Variable With Overall Satisfaction (OS).** (Derived from the Linear Regression Model)

Group	N	Sex	r	r <sup>2</sup>	F Change	df1	df2	Sig. F Change
No Disabilities	3479	F	.633	.401	2327.37	1	3477	<.001
	2192	M	.660	.436	1690.19	1	2190	<.001
With Disabilities	220	F	.705	.497	215.52	1	218	<.001
	174	M	.731	.534	196.89	1	172	<.001

### 12.2 SSI Satisfaction Scales and Decision to Enroll Again

Initially our correlation analysis showed that all twelve satisfaction scales were significantly and positively correlated with the ‘*decision to enroll again*’ variable. This was true for all four study groups (Table 38). Of the twelve scales, the two with the highest Pearson correlation coefficients for females and males with and without disabilities, were *Student Centeredness* and *Campus Climate*. However, it should be noted that all six items on the *Student Centeredness* scale were also included in the fifteen item *Campus Climate* scale, and this could account for the similarities between the two. *Instructional Effectiveness* was the scale with the third highest correlation for three of the groups, and ranked fourth for females with disabilities behind *Concern for the Individual*. For males with disabilities the correlations and r<sup>2</sup> values of the ‘*decision to enroll again*’ question and the scale variables were higher than for the other groups (Table 38).

### 12.3 SSI Items and Decision to Enroll Again

When all seventy-three items were entered into the linear regression model, the bulk of the variability in the ‘*decision to enroll again*’ question was accounted for by one item that occurs on both the *Campus Climate* and *Student Centeredness* scales, and that was ‘*It is an enjoyable experience to be a student on this campus.*’ This was also the variable most highly correlated with OS. It accounted for approximately 30% of the variability in the ‘*decision to enroll again*’ variable in the models for males and females without as well as females with disabilities, and 40% of the variability for males with disabilities (Table 39).

**Table 38. Pearson Correlations of Twelve Satisfaction Scales with ‘Overall Satisfaction’ and ‘Decision to Enroll Again’ Variables. (Items with the highest correlations are highlighted in bold).**

			Reenroll	OS	Student Centeredness	Instructional Effectiveness	Diverse Populations	Campus Support Services	Safety and Security	Academic Advising	Adm/Financial Aid	Academic Services	Registration Effectiveness	Service Excellence	Concern for the Individual	Car
F No Dis	Correl	Reenroll	1	<b>.633</b>	<b>.531</b>	<b>.468</b>	.256	.368	.240	.347	.294	.364	.368	.404	.414	.5
	Sig.			<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
	N		3479	3479	3479	3479	3479	3479	3479	3479	3479	3479	3479	3479	3479	3479
	r <sup>2</sup>			<b>40.1%</b>	<b>28.2%</b>	<b>21.9%</b>	6.6%	13.5%	5.7%	12.1%	8.6%	13.2%	13.5%	16.3%	17.1%	27
	Correl	OS	.633	1	<b>.566</b>	<b>.482</b>	.234	.359	.250	.374	.315	.361	.406	.436	.433	.5
	Sig.		.000		.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N		3479	3479	3479	3479	3479	3479	3479	3479	3479	3479	3479	3479	3479	3479
	r <sup>2</sup>		<b>40.1%</b>		<b>32.0%</b>	<b>23.2%</b>	5.5%	12.9%	6.3%	14.0%	9.9%	13.0%	16.5%	19.0%	18.7%	31
M No Dis	Correl	Reenroll	1	<b>.660</b>	<b>.536</b>	<b>.485</b>	.322	.364	.256	.379	.362	.386	.394	.426	.438	.5
	Sig.			<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
	N		2192	2192	2192	2192	2192	2192	2192	2192	2192	2192	2192	2192	2192	2192
	r <sup>2</sup>			<b>43.6%</b>	<b>28.7%</b>	<b>23.5%</b>	10.4%	13.3%	6.6%	14.4%	13.1%	14.9%	15.5%	18.2%	19.2%	29
	Correl	OS	.660	1	<b>.542</b>	<b>.500</b>	.323	.359	.261	.383	.349	.361	.409	.427	.451	.5
	Sig.		.000		<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
	N		2192	2192	2192	2192	2192	2192	2192	2192	2192	2192	2192	2192	2192	2192
	r <sup>2</sup>		<b>43.6%</b>		<b>29.3%</b>	<b>25.0%</b>	10.4%	12.9%	6.8%	14.7%	12.2%	13.0%	16.7%	18.3%	20.3%	28
F With Dis	Correl	Reenroll	1	<b>.705</b>	<b>.519</b>	.422	.329	.331	.312	.405	.365	.265	.413	.405	<b>.432</b>	.5
	Sig.			<.000	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
	N		220	220	220	220	220	220	220	220	220	220	220	220	220	220
	r <sup>2</sup>			<b>49.7%</b>	<b>26.9%</b>	<b>17.8%</b>	10.8%	11.0%	9.7%	16.4%	13.4%	7.0%	17.0%	16.4%	18.7%	29
	Correl	OS	.705	1	<b>.574</b>	<b>.526</b>	.398	.355	.375	.447	.404	.356	.431	.458	.504	.5
	Sig.		<.001		<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
	N		220	220	220	220	220	220	220	220	220	220	220	220	220	220
	r <sup>2</sup>		<b>49.7%</b>		<b>32.9%</b>	<b>27.7%</b>	15.9%	12.6%	14.0%	20.0%	16.3%	12.7%	18.6%	20.9%	25.4%	32
M With Dis	Correl	Reenroll	1	<b>.731</b>	<b>.649</b>	<b>.627</b>	.535	.396	.412	.487	.400	.473	.491	.525	.551	.6
	Sig.			<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
	N		174	174	174	174	174	174	174	174	174	174	174	174	174	174
	r <sup>2</sup>			<b>53.4%</b>	<b>42.2%</b>	<b>39.3%</b>	28.6%	15.7%	17.0%	23.7%	16.0%	22.4%	24.1%	27.6%	30.3%	39
	Correl	OS	0.731	1	<b>.648</b>	<b>.670</b>	.517	.406	.439	.461	.423	.506	.555	.571	.548	.6
	Sig.		<.001		<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001	<.001
	N		174	174	174	174	174	174	174	174	174	174	174	174	174	174
	r <sup>2</sup>		<b>53.4%</b>		<b>42.0%</b>	<b>44.9%</b>	26.7%	16.5%	19.3%	21.3%	17.9%	25.6%	30.8%	32.6%	30.0%	44

**Table 39. Changes in  $r^2$  and Significance of SSI Item Variables Regressed on the ‘Decision to Enroll Again’ Variable. (Only items with an  $r^2$  change of at least 1% and  $p < .001$  are shown).**

Group	Variable	r	$r^2$	Change $r^2$	F Change	df1	df2	Sig. F Change
Females	28. It is an enjoyable experience to be a student on this campus.	.555	.307	.307	1503.87	1	3387	<.001
No Disab	70. I am able to experience intellectual growth here.	.583	.340	.033	168.87	1	3386	<.001
N = 3479	1. Most students feel a sense of belonging here.	.598	.358	.017	93.08	1	3385	<.001
	18. The quality of instruction I receive in most of my classes is excellent.	.610	.373	.014	78.12	1	3384	<.001
Males	28. It is an enjoyable experience to be a student on this campus.	.544	.296	.295	894.73	1	2131	<.001
No Disab	18. The quality of instruction I receive in most of my classes is excellent.	.579	.335	.039	125.18	1	2130	<.001
N = 2192	1. Most students feel a sense of belonging here.	.594	.353	.018	60.14	1	2129	<.001
	70. I am able to experience intellectual growth here.	.606	.367	.014	48.03	1	2128	<.001
F With Disab	28. It is an enjoyable experience to be a student on this campus.	.550	.302	.299	92.61	1	214	<.001
N = 220	7. Adequate financial aid is available for most students at this institution.	.588	.346	.041	14.43	1	213	<.001
M With Disab	28. It is an enjoyable experience to be a student on this campus.	.638	.407	.403	115.12	1	168	<.001
N = 174	29. Faculty are fair and unbiased in their treatment of individual students.	.695	.483	.074	24.69	1	167	<.001

Over twenty variables entered the model for students without disabilities and eight for students with disabilities. To highlight the most important variables, Table 39 shows the satisfaction items that entered the model with  $p < .001$  and contributed to at least 1% of the variability in the ‘*decision to enroll again*’ question. The item contributing most, for all groups, was ‘*It is an enjoyable experience to be a student on this campus*’, and the four variables entering the model for males and females without disabilities were the same. The items shown in Table 39 are primarily associated with the *Campus Climate/Student Centeredness* and the *Instructional Effectiveness* scales. However, the item concerning adequacy of financial aid was important for females with disabilities, but did not enter the models for the other groups.

### *Factors Contributing to Students Having an Enjoyable Experience on Campus*

In order to isolate the major factors contributing to a student having an enjoyable experience on campus, we regressed the item *'It is an enjoyable experience to be a student on this campus'* against the seventy-two remaining SSI item variables. Table 40 shows the outcomes of the analysis. All significant items contributing to having an enjoyable experience on campus were from the *Campus Climate/Student Centeredness* and *Instructional Effectiveness* scales.

#### **12.4 Summary – Decision to Enroll Again**

Although the twelve SSI satisfaction scale variables and many items had relatively high correlations with the question asking students *All in all, if you had to do it over, would you enroll here again?*, the strongest correlation proved to be with the OS variable. Moreover, most of the variability in the decision to re-enroll question for all groups was accounted for by one SSI item: *It is an enjoyable experience to be a student on this campus* (which was the variable most highly correlated with OS).

Making students feel welcome on campus, caring and supportive service staff and faculty, creating a sense of belonging and an environment where students can experience intellectual growth all contributed to students to having an enjoyable experience on campus.



**Table 40. Factors Contributing to Students Having an Enjoyable Experience on Campus.** (The item ‘It is an enjoyable experience to be a student on this campus’, regressed against 72 SSI Items. Only items with a  $r^2$  change of at least 1% and a  $p < .001$  are shown).

Group	Item	r	r <sup>2</sup>	r <sup>2</sup> Change	F Change	df1	df2	Sig. F Change
Females	36. Students are made to feel welcome on this campus.	.662	.438	.438	2705.50	1	3477	<.001
No Disabilities	1. Most students feel a sense of belonging here.	.718	.515	.078	558.47	1	3476	<.001
N = 3479	27. The campus staff are caring and helpful.	.743	.552	.036	282.67	1	3475	<.001
	70. I am able to experience intellectual growth here.	.753	.567	.015	123.62	1	3474	<.001
Males	36. Students are made to feel welcome on this campus.	.562	.316	.316	1011.60	1	2190	<.001
No Disabilities	1. Most students feel a sense of belonging here.	.643	.413	.097	362.15	1	2189	<.001
N = 2192	70. I am able to experience intellectual growth here.	.685	.469	.056	229.60	1	2188	<.001
	27. The campus staff are caring and helpful.	.706	.499	.030	131.97	1	2187	<.001
	22. People on this campus respect and are supportive of each other.	.721	.519	.020	91.69	1	2186	<.001
Females	36. Students are made to feel welcome on this campus.	.636	.405	.405	148.39	1	218	<.001
With Disabilities	1. Most students feel a sense of belonging here.	.705	.497	.092	39.44	1	217	<.001
N = 220	69. There is a good variety of courses provided on this campus.	.732	.536	.040	18.56	1	216	<.001
	23. Faculty are understanding of students' unique life circumstances.	.749	.561	.025	12.12	1	215	<.001
Males	70. I am able to experience intellectual growth here.	.625	.390	.390	109.98	1	172	<.001
With Disabilities	27. The campus staff are caring and helpful.	.704	.496	.106	35.84	1	171	<.001
N = 174	1. Most students feel a sense of belonging here.	.741	.549	.054	20.28	1	170	<.001

**13 Relationship Between Perception of Difficulty, Satisfaction and Decision to Enroll Again.**

Our hypotheses with respect to the Overall Satisfaction (OS) and Cegep Experience Questionnaire (CEQ) scores were as follows:

*Students who have higher overall satisfaction (OS) scores on the SSI will have higher (more facilitating) scores on the CEQ.*

*Both SSI and CEQ scores, which measure post - entry factors, will improve the models of attrition and academic performance that we have developed using pre-entry characteristics in our past work.*

For this analysis we used the archived CEQ scores of students who replied to the questionnaire in 2004 and 2005 and who also replied to the SSI in one of the years in which it was administered. If a student replied to the CEQ more than once, the 2005 CEQ score was used. The student needed to be enrolled in a diploma program (either careers or pre-university) at the time they replied to the SSI. Of a total of 432 students who replied to both surveys; 415 of them replied to the OS item on the SSI. The breakdown of the sample used in this part of the analysis is shown in Table 41.

**Table 41. Sample Used in CEQ/SSI Comparison. (Total N = 432).**

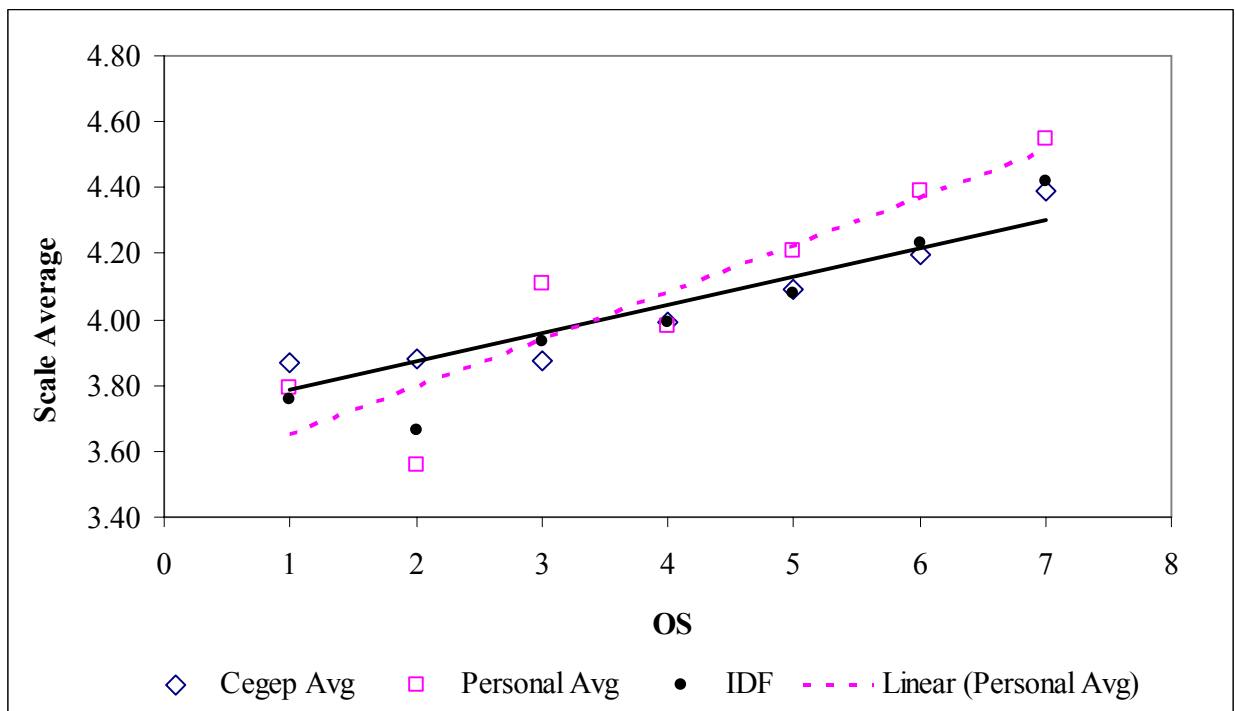
<b>Disability Status</b>	<b>SEX</b>	<b>N CEQ &amp; SSI</b>	<b>N CEQ &amp; OS</b>	
No Disabilities	Females	243	230	
	Males	127	123	
<b>Total No Disabilities</b>		<b>370</b>	<b>353</b>	
With Disabilities	Females	37	37	(*27 registered)
	Males	25	25	(*19 registered)
<b>Total With Disabilities</b>		<b>62</b>	<b>62</b>	
<b>Grand Total</b>		<b>432</b>	<b>415</b>	

*\*Registered with the disability services provider.*

### 13.1 Overall Satisfaction (OS) and CEQ Scale Scores

In order to determine if there was a pattern of higher (more facilitating) average CEQ scale scores for higher levels of the OS variable, we plotted the average scores of the CEQ *Personal* and *Cegep* scales as well as the *IDF* (Index of difficulty) against each level of the OS variable (7 levels) for the total sample. Figure 52 indicates that as the OS level increases, the average CEQ scale and IDF scores increase and, therefore, students who find their studies more facilitating are more satisfied.

**Figure 52. Relationship Between the OS Variable and the Average CEQ Personal, Cegep and IDF Scale Scores** (*Males and females with and without disabilities combined; N = 412 – 415*).

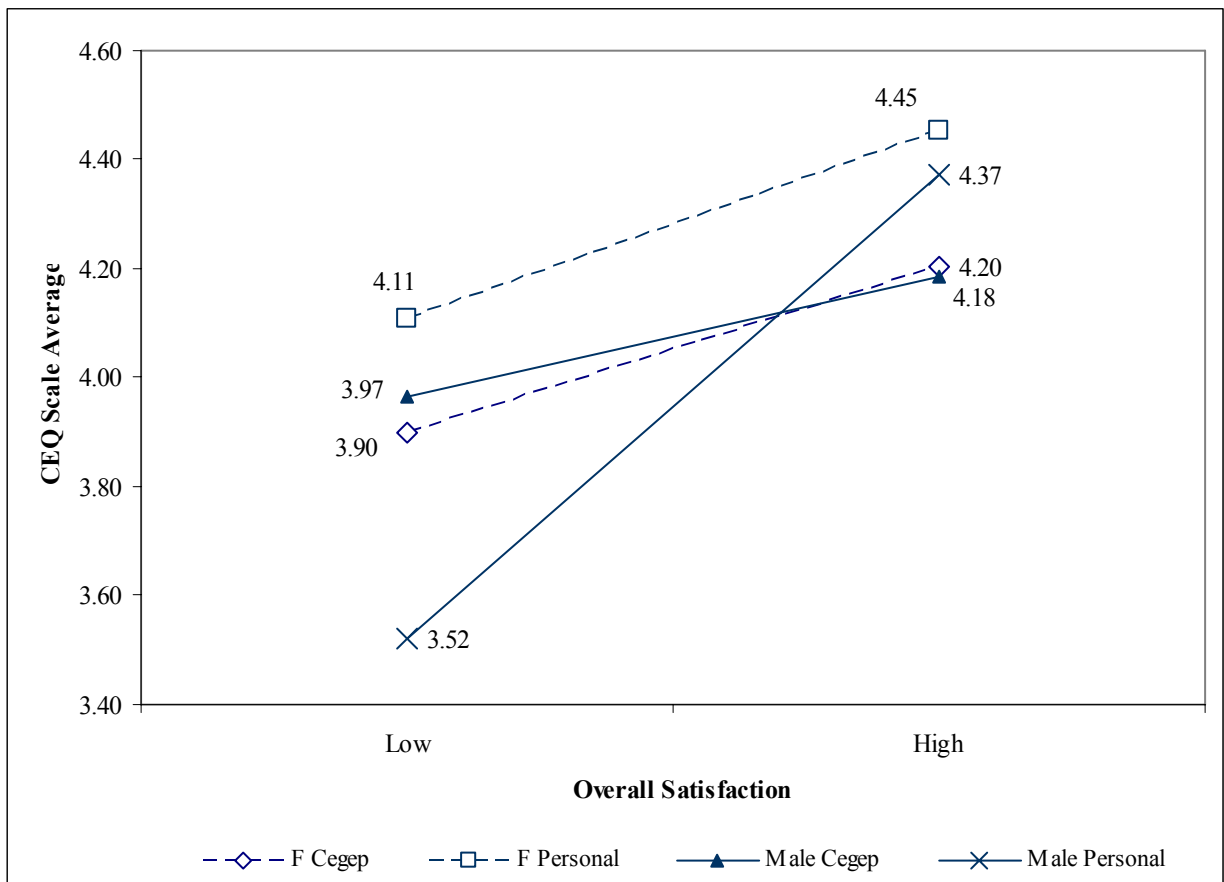


However, there were only thirty-nine students who fell in the OS levels 1 through 3. Because of the low number in this range, we combined the students with OS scores into two groups: those falling in the range of 1 through 4 are referred to as ‘Low OS’, and students with OS scores of 5 through 7 are referred to as ‘High OS’. However, even then only sixty-three students fell in the Low group and only three of these were males with disabilities. Consequently, it was not possible to do comparisons by sex and disability.

*Students Without Disabilities - CEQ Personal and Cegep Scales and OS*

The CEQ *Personal* and *Cegep* scale averages were compared for low and high levels of OS using a one-way ANOVA for males and females without disabilities. Results are shown in Table 42 and Table 43. The *Cegep* and *Personal* scale averages for Low and High OS for both sexes are plotted in Figure 53. Both males and females showed statistically significant differences in *Personal* scale averages between the Low and High satisfaction groups, with the male difference being especially steep.

**Figure 53. Females and Males Without Disabilities – CEQ Personal and Cegep Scale Averages For Low and High Levels of Overall Satisfaction (OS).**



**Table 42. CEQ Personal Scale Scores for High and Low Levels of Overall Satisfaction With and Without the CRCM Covariate (CoV).**

Disability Status	SEX	OS	Mean CEQ Scale Score	SD	N	Diff (High - Low)	df	F No Cov	Sig	F With CoV	Sig With CoV
No Disabilities	F	Low	4.11	0.77	33	0.35	1, 226	4.13	0.043	3.62	0.058
		High	4.45	0.93	195						
		Total	4.40	0.91	228						
	M	Low	3.52	1.14	16	0.85	1, 120	13.14	<.001	12.95	<.001
		High	4.37	0.83	106						
		Total	4.26	0.92	122						
Total	Low	3.85	0.90	49	0.49	1, 348	12.99	<.001	12.01	.001	
	High	4.33	0.87	301							
	Total	4.25	0.88	350							
With Disabilities	Total	Low	3.93	0.65	14	0.24	1, 60	0.83	.366	0.80	.374
		High	4.17	0.92	48						
		Total	4.12	0.87	62						

**Table 43. CEQ Cegep Scale Score for High and Low Levels of Overall Satisfaction With and Without the CRCM Covariate (CoV).**

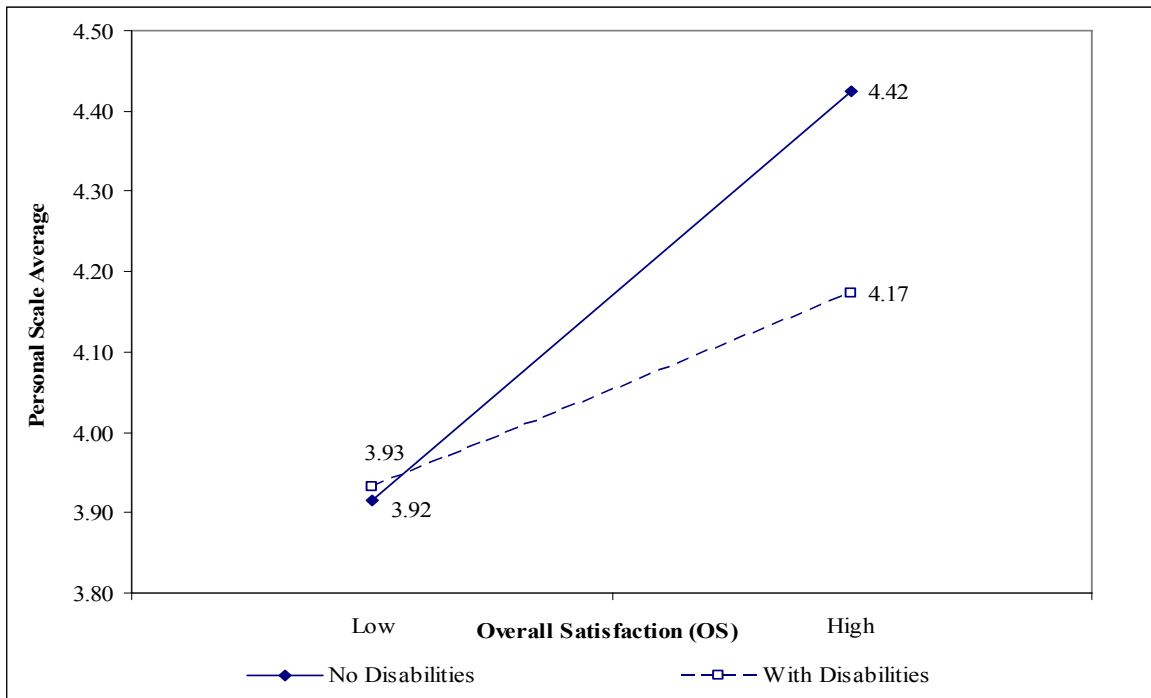
Disability Status	SEX	OS	Mean CEQ Scale Score	SD	N	Diff (High - Low)	df	F No Cov	Sig No CoV	F With CoV	Sig With CoV
No Disabilities	F	Low	3.90	0.68	33	.31	1, 227	5.92	0.016	5.90	.016
		High	4.20	0.67	196						
		Total	4.16	0.67	229						
	M	Low	3.97	0.67	15	.22	1, 119	1.40	0.238	1.39	.240
		High	4.18	0.66	106						
		Total	4.16	0.67	121						
Total	Low	3.92	0.67	48	.28	1, 348	7.20	0.008	7.18	.008	
	High	4.20	0.66	302							
	Total	4.16	0.67	350							
With Disabilities	Total	Low	3.92	0.61	14	.47	1, 60	4.51	0.038	4.34	.042
		High	4.39	0.74	48						
		Total	4.28	0.72	62						

When the *Cegep* scale averages were compared, only females showed a significant difference between the Low and High OS groups. When the CRCM grade was used as a covariate, the differences in CEQ scale scores between the Low and High satisfaction groups persisted, although for females the results were marginal for the *Personal* scale (Females  $p = .058$ , Table 42). Females with low overall satisfaction tended to indicate that both *Personal* and *Cegep* factors made their studies more difficult. For males, only the *Personal* scale was significant.

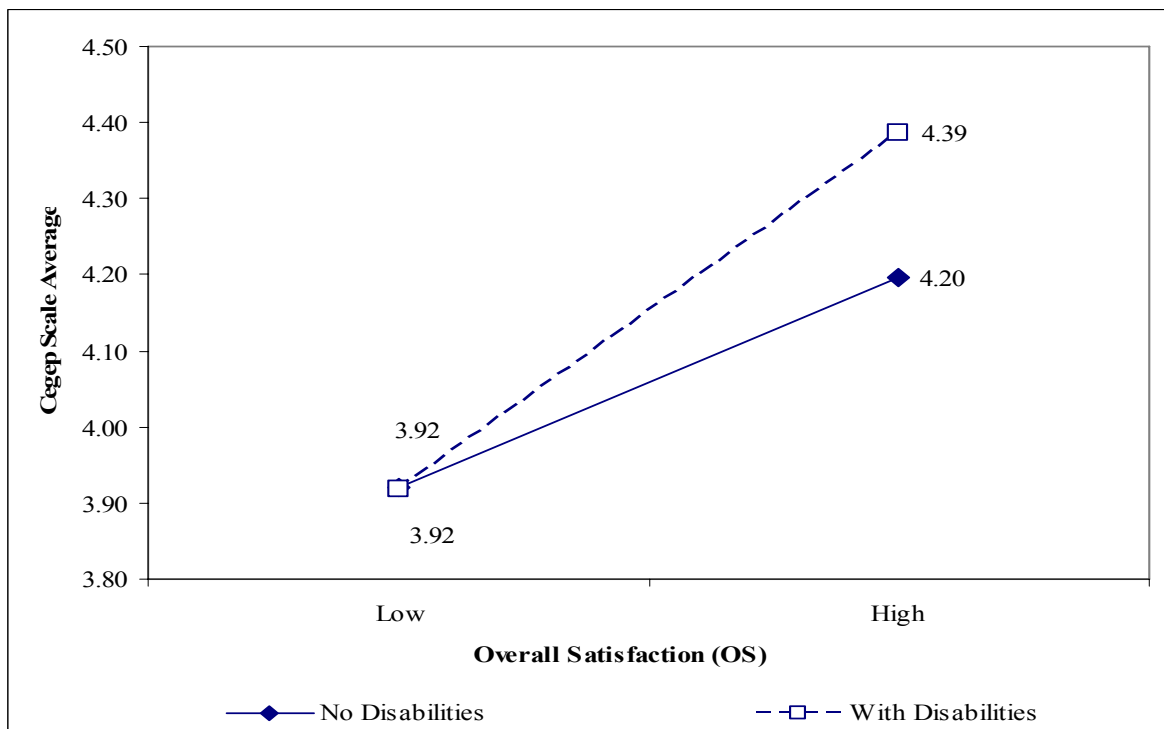
#### *Students with Disabilities*

As there were insufficient numbers of male students with disabilities ( $N = 3$ ) in the Low OS group for a meaningful analysis, a comparison was undertaken for all students with disabilities. It should be noted that the number of students with disabilities in the Low group was still small (3 males and 11 females). The results of the ANOVA are shown in Table 42 and the *Personal* and *Cegep* scale plots are shown in Figures 54 and 55 respectively, with the relevant comparisons to students without disabilities.

**Figure 54. Students With Disabilities – CEQ Personal Scale Averages For Low and High Levels of Overall Satisfaction (OS).**



**Figure 55. Students With Disabilities – CEQ Cegep Scale Averages For Low and High Levels of Overall Satisfaction (OS).**



By comparing Figure 54 and Figure 55 it can be seen that the slope of the *Cegep* scale was steeper than the slope of *Personal* scale for students with disabilities, suggesting a stronger relationship between *Cegep* factors on overall satisfaction for these students. This was the only scale that was significant. However, this could be a reflection of the higher numbers of females in the sample of students with disabilities as *Cegep* factors were significant for females without disabilities but not for males.

### 13.2 CEQ Item Correlations with the OS Indicator

#### *Males and Females Without Disabilities*

There were significant differences in average CEQ scale scores between Low and High levels of overall satisfaction (OS), and the statistically significant correlations of the specific CEQ scale items with the OS variable were low to moderate, ranging between .15 - .27 for females and .17 and .34 for males (Table 44). The items showing the highest correlations for males were *Previous Educational Experience* ( $r = .34$ ) and *Friends* ( $r = .33$ ), followed by *Level of Personal Motivation* ( $r = .30$ ), all on the *Personal* scale. The items showing the highest correlation for females were *Willingness of professors to adapt courses to my needs* ( $r = .27$ ) and *Attitudes of non-teaching staff* ( $r = .23$ ), both items occurring on the *Cegep* scale. The items that showed the highest significant correlations for females on the *Personal Scale* were *Financial Situation* ( $r = .21$ ) and *Paid Employment* ( $r = .21$ ), two items that were not significantly correlated with OS for males. Although the overall *Cegep* scale average was not significantly correlated with OS for males, two items on the scale were correlated with OS. These were *Attitudes of professors* ( $r = .24$ ) and *Attitudes of students* ( $r = .28$ ).

#### *Students With Disabilities*

The only items that showed a significant correlation with OS for students with disabilities were the *Cegep* scale items *Availability of computers on campus* (Males only,  $r = .66$ ) and *Availability of course materials* (Females only,  $r = .33$ ). The disability specific items '*Impact of my disability*' and '*Availability of disability services at the cegep*' were not significantly correlated with OS for either sex.



**Table 44. CEQ *Personal Scale* - Item Correlations With Overall Satisfaction (OS) for Males and Females Without Disabilities.** (*Correlations use all levels of the OS variable*).

<b>Personal Scale</b>	<b>Females</b>			<b>Males</b>		
	N	r	p	N	r	p
Financial situation	203	.209	.003	103	.082	.411
Paid employment	163	.210	.007	90	.033	.761
Family situation	218	.189	.005	112	.231	.014
Friends	223	.154	.021	112	.334	.000
Level of personal motivation	230	.109	.100	121	.303	.001
Study habits	229	.155	.019	121	.176	.053
Previous education experiences	218	.011	.875	117	.340	.000
Health	192	.159	.027	100	.068	.499
<b>Personal Scale</b>	<b>228</b>	<b>.224</b>	<b>.000</b>	<b>122</b>	<b>.292</b>	<b>.001</b>

*Highlighted items are significant.*

**Table 45. CEQ *Cegep Scale* Item Correlations With OS for Males and Females Without Disabilities.** (*Correlations use all levels of the OS variable*).

<b>Cegep Scale</b>	<b>Females</b>			<b>Males</b>		
	N	r	p	N	r	p
Level of difficulty of courses	226	.008	.901	119	-.003	.974
Course load	227	.079	.239	119	.048	.605
Attitudes of professors	230	.170	.010	120	.241	.008
Attitudes of non-teaching staff	209	.234	.001	114	.106	.262
Attitudes of students	224	.094	.161	114	.279	.003
Availability of computers on campus	226	.013	.846	115	-.107	.253
Availability of course materials	219	.182	.007	119	-.041	.658
Opportunity to participate in Cegep extracurricular activities	134	.202	.019	82	.042	.709
Willingness of professors to adapt courses to my needs	184	.273	<.001	107	.005	.962
Accessibility of building facilities (e.g., doorways, classrooms)	221	.124	.067	110	.049	.610
Accessibility of Cegep physical education courses	194	.129	.072	107	-.021	.829
<b>Cegep Scale</b>	<b>229</b>	<b>.255</b>	<b>.000</b>	<b>121</b>	<b>.107</b>	<b>.241</b>

*Highlighted items are significant.*

However, although only 22 of the 62 students with disabilities responded to one of the items that was not associated with either the *Cegep* or *Personal* scales, this item (*Tutoring outside the Cegep*) showed significant correlations with OS ( $r(N = 22) = .74, p < .001$ ).

### 13.3 Linear Regression Modeling - CEQ Variables and OS

#### *Students Without Disabilities*

When we conducted a linear regression of the OS variable against the *Personal* and *Cegep* item variables (using mean replacement), the variables entering the model varied by sex. For males without disabilities two personal factors, *Friends* and *Previous educational experiences*, explained 17% of the variability in OS. The *Availability of computers on campus* (although not significant in the initial correlation analysis), *Attitudes of students* and *Motivation* explained an extra 9%. For females, *Willingness of professors to adapt courses*, *Attitudes non-teaching staff* and *Financial situation* together accounted for 13% of the variability in OS (Table 46).

#### *Students with Disabilities*

For females with disabilities *Availability of course materials* accounted for 11% of the variability in OS. For males with disabilities the *Availability of computers on campus* was particularly important, and accounted for 44% of the variability in OS. *Availability of course materials*, although not significant in the initial correlation analysis, was also important and explained an additional 12% of the variability in the linear regression model for males with disabilities (Table 46).

### 13.4 CEQ Scale Scores, Overall Satisfaction and Decision to Enroll Again

#### *Students Without Disabilities*

For females without disabilities, the three CEQ items that entered the linear regression model for OS, also entered the linear regression model for the ‘decision to enroll again’ item. *Willingness of professors to adapt courses to my needs*, *Financial situation* and *Attitudes of students* accounted for 9% of the variability for this item.

**Table 46. Outcomes of Linear Regression Modeling for CEQ Item Variables and Overall Satisfaction (OS).**

Group	Sex	CEQ Item	r	r <sup>2</sup>	Adjusted r <sup>2</sup>	r <sup>2</sup> Change	F Change	df1	df2	p
No Disabilities	Females (N = 230)	Willingness of professors to adapt courses to my needs	.245	.060	.056	.060	14.50	1	228	<.001
		Attitudes of non-teaching staff	.310	.096	.088	.036	9.14	1	227	.003
		Financial situation	.353	.125	.113	.028	7.33	1	226	.007
	Males (N = 122)	Previous educational experience	.325	.106	.098	.106	14.19	1	120	<.001
		Friends	.415	.172	.158	.066	9.52	1	119	.003
		Availability of computers on campus	.450	.202	.182	.030	4.48	1	118	.036
		Attitudes of students	.489	.239	.213	.037	5.70	1	117	.019
		Motivation	.515	.266	.234	.026	4.17	1	116	.043
	With disabilities	Females (N = 37)	Availability of course materials	.329	.108	.083	.110	4.26	1	35
Males (N = 25)		Availability of computers on campus	.661	.437	.413	.437	17.87	1	23	<.001
		Availability of course materials	.745	.555	.514	.118	5.82	1	22	.025

For males, *Motivation* was the most important, and accounted for 11% of the variability in the ‘*decision to enroll again*’ item. This variable also entered the model for OS.

#### *Students With Disabilities*

The only variable related to the ‘*decision to enroll again*’ for students with disabilities was the *Computers on campus* variable for males ( $r = .66, p < .001$ ), and this accounted for 44% of the variability in the ‘*decision to enroll again*’ item.

### **13.5 Summary – CEQ and Decision to Enroll Again.**

There was support for our hypothesis that there was a correlation between CEQ scores and Overall Satisfaction (OS). When the CEQ scale averages were plotted for each level of the OS variable for all students in the sample, the average *Cegep* and *Personal* scale averages increased at higher levels of the OS variable (i.e. students who found their experiences more facilitating were more satisfied).

When the Low OS (levels 1 - 4) and High OS (levels 5 – 7) groups were compared, there were significant differences in mean CEQ scale scores for both males and females without disabilities on the *Personal* scale, and for females only on the *Cegep* scale. Moreover, the male slope was steeper than the female slope on the *Personal* scale, indicating a potentially greater impact of *Personal* factors on the satisfaction of males compared to females.

*Previous educational experience, Friends, Availability of computers on campus, Attitudes of students* and *Motivation* were related to the overall satisfaction of males. For females the important variables were *Willingness of professors to adapt courses to my needs, Attitudes of non-teaching staff* and *Financial Situation*.

Although it was not possible to do a comparison of students with disabilities by sex due to the low sample size on the OS range 1 - 4, an overall comparison of students with disabilities was undertaken. The outcome suggests that *Cegep* factors may be more important than *Personal* factors in influencing the satisfaction of students with disabilities,

as only the *Cegep* scale mean showed a significant difference between Low and High OS. However, this may have been due to the higher number of females in the sample.

For students with disabilities, two individual items on the *Cegep* scale when regressed against OS were significant for males: *Availability of computers on campus* and *Availability of course materials*. For females, only *Availability of course materials* was significant. One CEQ item, related to private tutoring outside the college, that is not associated with either the *Personal* or *Cegep* scales, was strongly correlated to OS for a subset of students with disabilities.

## 14 CEQ, Overall Satisfaction and Retention

### 14.1 Comparison of CEQ and Retention

For the students who responded to the CEQ, we examined the CEQ *Personal* and *Cegep scale* averages, as well as the OS scores for students who were and those who were not retained. This proved difficult, as only twelve of four hundred and thirty-two students responding to the CEQ were not retained. The high number falling in the retained category was due to the fact that the CEQ was administered to both graduates and non-graduates, and the number of graduates sampled was larger. Because of this constraint, the comparison of differences in CEQ scale means was carried out on the total sample, without a breakdown by sex or disability. Table 47 shows the outcomes of the comparisons of scale means using one-way ANOVA.

The only significant difference in CEQ scores between those who were and were not retained was for the *Personal* scale with a difference of 0.60. The differences in means for the *Cegep* scale and the SSI OS variables, between students who were and were not retained, were not significant. However, the difference in means for the SSI OS variable for students who responded to the CEQ showed a difference of 0.42. This difference, although not significant here, was nearly identical to the difference of 0.43 in the larger sample, a difference that was significant. The results of the larger sample are shown in Table 47 by way of comparison.

**Table 47. Means for Selected SSI and CEQ Variables, Showing Differences Between Students Who Were Retained and Students Who Left Their Studies (With and Without Covariates).**

<b>Variable</b>		<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>F</b>	<b>df</b>	<b>Sig</b>	<b>Diff</b>																																																																																						
CEQ Personal Scale (No Cov)	Not Retained	12	3.64	0.64	5.45	1, 430	.020	0.60																																																																																						
	Retained	417	4.24	0.88					CEQ Personal Scale (SecV as CoV)	Not Retained	12	3.64	0.64	3.26	1, 391	.070	0.56	Retained	382	4.20	0.90	CEQ Personal Scale (CRCM as CoV)	Not Retained	12	3.64	0.64	3.61	1, 426	.058	0.60	Retained	417	4.24	0.90	CEQ Cegep Scale (No Cov)	Not Retained	12	4.01	0.54	0.75	1, 425	.386	0.17	Retained	415	4.18	0.68	CEQ Cegep Scale (With SecV as CoV)	Not Retained	12	4.01	0.54	0.67	1, 389	.412	0.17	Retained	380	4.18	0.69	CEQ Cegep Scale (With CRCM as CoV)	Not Retained	12	4.01	0.54	0.81	1, 424	.369	0.17	Retained	415	4.18	0.69	SSI Overall Satisfaction (CEQ Sample)	Not Retained	12	5.17	1.40	1.24	1, 414	.267	0.42	Retained	415	5.59	1.30	SSI Overall Satisfaction (Larger Sample)	Not Retained	972	5.29	1.53	79.08	1, 591	<.001
CEQ Personal Scale (SecV as CoV)	Not Retained	12	3.64	0.64	3.26	1, 391	.070	0.56																																																																																						
	Retained	382	4.20	0.90					CEQ Personal Scale (CRCM as CoV)	Not Retained	12	3.64	0.64	3.61	1, 426	.058	0.60	Retained	417	4.24	0.90	CEQ Cegep Scale (No Cov)	Not Retained	12	4.01	0.54	0.75	1, 425	.386	0.17	Retained	415	4.18	0.68	CEQ Cegep Scale (With SecV as CoV)	Not Retained	12	4.01	0.54	0.67	1, 389	.412	0.17	Retained	380	4.18	0.69	CEQ Cegep Scale (With CRCM as CoV)	Not Retained	12	4.01	0.54	0.81	1, 424	.369	0.17	Retained	415	4.18	0.69	SSI Overall Satisfaction (CEQ Sample)	Not Retained	12	5.17	1.40	1.24	1, 414	.267	0.42	Retained	415	5.59	1.30	SSI Overall Satisfaction (Larger Sample)	Not Retained	972	5.29	1.53	79.08	1, 591	<.001	0.43	Retained	4941	5.72	1.34								
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When the CRCM and high school grades (Sec V) were used as covariates, the difference in the CEQ *Personal* scale averages for students who were and were not retained was no longer significant at  $p < .05$ , but approached significance at  $p < .10$ . Based on this limited data, the results suggest that students who left tended to be those who perceived their studies to be more difficult due to personal factors, entered with lower high school grades, received lower college grades and were less satisfied than students who were retained.

#### 14.2 Logistic Regression: CEQ and OS

When we examined the Overall Satisfaction (OS) indicator we found that although there was a statistically significant association between retention and OS, only a small amount of the variability in retention was accounted for by the OS variable, and the strength of the association between the two variables was weak. However, it was difficult to compare retention rates for students who responded to the CEQ questionnaire, as only 66 students in the sample were not graduates at the time they completed the questionnaire, and of these only twelve were no longer enrolled and had not graduated at the time this study was undertaken. Of the 66 students in the sample, forty had disability. Therefore, it was not possible to do comparisons by sex or disability due to the small sample sizes for the different groups.

When we compared the *Personal* scale average of the 12 students who were retained, with those who dropped out, the difference in means (0.54) was statistically significant, suggesting that students who were retained perceived *Personal* factors to be more facilitating. There was no statistically significant difference in means for the CEQ *Cegep* scale between those who were retained and those who dropped out. (Table 47)

However, using this sample of 66 students, we attempted to test whether the CEQ *Personal* scale was a better predictor of retention than OS or high school grades (Sec V) using the same metrics we used for OS. When the binary regression was run, only the CEQ *Personal* scale average entered the model and this was significant using the change in the Log likelihood ( $p = .038$ ), although not the Wald Statistic. For this sample ( $N = 66$ ), the results of the logistic regression for the OS variable were not significant, although the outcomes

were similar to the results obtained for students with disabilities for the larger sample (N = 394). The low sample size was probably responsible for the lack of significance. These results are shown in Table 48 for the sake of comparison.

Neither the Overall Satisfaction (OS) indicator (at N = 66) nor the CEQ *Personal* scale average had AUCs that were significant at  $p < .05$ , although they approached significance at  $p < 0.10$ . The AUCs were similar (0.67), and rated as poor.

When CEQ items correlations were run, there was only one item on the CEQ *Cegep* scale that was correlated with retention, and that was *Attitudes of students* ( $r(N = 66) = .25, p = .04$ ). The *Previous educational experience* variable (*Personal* scale) was close to significance ( $r(N = 66) = .24, p = .06$ ).

### **14.3 Summary - Overall Satisfaction, CEQ Scales and Retention**

Although the results are inconclusive due to the small sample size, the data suggests that the CEQ *Personal* scale and the SSI OS variable are similar in their ability to predict retention. Neither are strong predictors, but both produce results on their own that are similar to the models using high school grades. Cegep factors did not enter our regression model.



**Table 48. Outcomes of Logistic Regression Model With Retention as the Binary Variable** (*Mean replacement was used to maintain a sample size of N = 66*)

N	Variable	B	S.E.	Wald	df	Sig.	Exp(B)	Nagelkerke R <sup>2</sup>	AUC	*p AUC	Rate AUC
66	SSI Overall Satisfaction (CEQ)	0.330	0.200	2.550	1	0.111	1.385	0.099	0.674	0.060	Poor (ns)
	Constant	-0.310	1.150	0.070	1	0.785	0.730				
394	SSI Overall Satisfaction	0.340	0.070	24.720	1	0.000	1.404	0.095	0.678	<.001	Poor
	Constant	-0.550	0.360	2.370	1	0.123	0.576				
66	CEQ Personal Scale	0.810	0.430	3.630	1	*0.057	2.258	0.099	0.670	0.067	Poor (ns)
	Constant	-1.740	1.670	1.090	1	0.296	0.175				
66	Previous Ed Experience (Item 17)	0.418	0.227	3.402	1	0.065	1.519	0.085	0.637	0.139	Poor (ns)
	Constant	-0.157	0.907	0.030	1	0.863	0.855				
66	SecV	0.104	0.059	3.059	1	0.080	1.109	0.086	0.656	0.093	Poor (ns)
	Constant	-6.152	4.322	2.027	1	0.155	0.002				
488	SecV (comparable sample)	0.084	0.017	22.831	1	0.000	1.087	0.082	0.647	<.001	Poor
	Constant	-5.107	1.299	15.467	1	0.000	0.006				
152	SecV (No Disabilities)	0.114	0.034	11.205	1	0.001	1.120	0.113	0.732	<.001	Fair
	Constant	-7.019	2.515	7.792	1	0.005	0.001				
296	SecV (With Disabilities)	0.068	0.021	10.638	1	0.001	1.070	0.057	0.599	0.009	Fail
	Constant	-4.072	1.541	6.983	1	0.008	0.017				
66	CEQ Cegep Scale	0.524	0.521	1.011	1	0.315	1.689	0.027	0.597	0.295	Fail (ns)
	Constant	-0.653	2.133	0.094	1	0.760	0.520				

\* *The change in the -2 log-likelihood (which is more reliable than the significance of the Wald statistic), was significant at p = .038 for the Personal Scale average and p = .042 for the Attitude of Fellow Students variable, so the variables entered the equation.*

## 15. Summary of Findings

The following summarizes the findings related to the questions raised by our hypotheses.

*1. Do males and females differ in what they believe are important aspects of the college experience?*

Generally, our hypothesis that males and females will differ in the aspects of their college experience that are important was not supported. We examined U.S. Community Colleges and the Canadian two-year colleges data sets (provided by Noel-Levitz) by sex, as well as our study sample by sex and disability. Although there was an overall tendency for males to score importance items lower than females, there was a strong correlation between male and female scores on the eleven importance scales, and this was true for both students with and without disabilities. All groups ranked *Instructional Effectiveness* highest in importance. However, one obvious difference between the sexes was the relatively higher importance assigned to *Safety and Security* by females in the Community College sample. In addition, males with disabilities ranked *Campus Support Services* four places higher and *Admissions and Financial Aid* five places lower than females with disabilities.

*2. Do students with and without disabilities differ in what they believe are important aspects of the college experience?*

Our hypothesis that students with and without disabilities would not differ in what they believe are important aspects of the college experience was supported. The relative importance of the scale items for students with disabilities in our study sample correlated strongly with those of students without disabilities, and this was true for both sexes.

*3. Are females (both those with and without disabilities) more satisfied with their college experiences than their male counterparts?*

We did find that generally, males across colleges in North America had satisfaction scores that were below those of their female counterparts. These differences persisted even when we co-varied grades with satisfaction in our study sample. However, males and females were more or less satisfied with the same things, and the SSI scale and item satisfaction scores were highly correlated for all groups examined. However, the fact that (1) male

overall satisfaction fell below female satisfaction for all scales and samples tested, (2) the peaks and troughs of satisfaction on the twelve scales were similar, and (3) the average item and scale scores were highly correlated, suggests that the difference in satisfaction between the sexes may, in fact, be a reflection of a general tendency by males to score items lower than females, rather than real differences between the sexes in the areas with which they were satisfied or dissatisfied. However, the item relating to equipment in the lab facilities being current had a larger than average difference, and may be an area of concern for males more so than females for both students with and without disabilities

Larger than average differences in satisfaction were also found between males and females with disabilities with items relating to knowledge concerning what's happening on campus, the institution's commitment to part-time students, the reasonableness of class change (drop/add) policies, how new student orientation services help students adjust to college, and how student recruitment and admissions personnel respond to prospective students' unique needs and requests.

*4. Do students with disabilities express the same level of satisfaction with their college experience as those without disabilities?*

Our hypothesis that students with disabilities will express the same level of satisfaction with their college experiences as those without disabilities was not supported, as overall males and females with disabilities expressed lower levels of satisfaction than their non-disabled peers on the global satisfaction variable (OS) as well as five of the twelve scale variables. However, this was dependent on whether or not the student registered for disability services.

*5. Are students with disabilities who register for disability related services from the college more satisfied than either students with disabilities who do not register, or students without disabilities?*

Registering for disability services on-campus appears to have a different impact on satisfaction depending on sex and disability type. Generally, for both females with LD/ADD and females with disabilities other than LD/ADD, registering for services tended

to ameliorate areas of dissatisfaction expressed by females with disabilities who did not register, and thus ‘levels the playing field’ relative to females without disabilities.

However, the pattern for males with LD/ADD seems to suggest that they were less satisfied than males without disabilities, regardless of whether or not they registered with the service provider. On the other hand, males with disabilities other than LD/ADD not only had satisfaction levels equivalent to their non-disabled peers, but in areas expressed even greater satisfaction. The registered males with disabilities other than LD/ADD appeared to be the group that benefited most from registering for services, as expressed by their greater satisfaction with many different aspects of their college life, compared to both unregistered males and males without disabilities.

*6. Is low student satisfaction with their college experiences related to lower retention rates?*

Students who were more satisfied tended to have higher retention rates and this was true for males and females with and without disabilities. Between those with the lowest and highest overall satisfaction, the overall difference in retention rate averaged about 10%. With the exception of males with disabilities, this difference in retention disappeared when grades were used as a covariate in our model. Thus, it was difficult to tell whether it was higher grades or higher satisfaction that led to higher retention. However, for males with disabilities both satisfaction and grades made separate contributions, although in the logistic regression grades dominated. Even here the changes were small with OS adding little to the ability to discriminate between the two groups once grades were taken into consideration. The relationship between retention and satisfaction was not linear. The upward trend in satisfaction tends to flatten at satisfaction scores above five. Thus, once a certain level of satisfaction is reached, there is no further improvement in the retention rate. Satisfaction was a better predictor of retention for students with disabilities.

We used the item *All in all, if you had to do it over, would you enroll here again?* as an indirect measure of satisfaction, as dissatisfied students are unlikely to respond positively to this question. Although the twelve SSI satisfaction scale variables and many items had

relatively high correlations in response to the question, the strongest correlation proved to be with the overall satisfaction (OS) variable. Moreover, most of the variability in the decision to enroll again question for all groups was accounted for by one item: *It is an enjoyable experience to be a student on this campus* (which was the variable most highly correlated with OS). Making students feel welcome on campus, caring and supportive service staff and faculty, creating a sense of belonging and an environment where students can experience intellectual growth all contributed to students having an enjoyable experience on campus.

7. *Is low satisfaction with Instructional Effectiveness the strongest predictor academic performance?*

The data did not support the hypothesis that satisfaction with *Instructional Effectiveness* (IE) would be the strongest predictor of academic grades. The global satisfaction variable (OS) was more strongly correlated with the grades than Instructional Effectiveness. None of the variables we tested were strong discriminators between those with high and low grades. When the scale variables were tested, the IE scale variable did not enter the model for males, but did enter for females. The scale variables operating together had the strongest association with the CRCM as measured by the Nagkerke  $R^2$ , however, even in this case the association was weak.

8. *Do students with the largest gap between the aspects of college life they consider important and their satisfaction with the extent to which they believe the college meets their expectations in this area, have the highest rate of attrition.*

For the SSI scales where the gap sizes did show a correlation with retention rate, the correlations were weak. The scales that showed statistically significant differences in retention rates between low and high gap sizes depended on sex and disability. For students without disabilities, *Instructional Effectiveness* had the strongest correlation for females and *Admissions and Financial Aid* for males. The only scale showing a significant correlation for students with disabilities was *Safety and Security*, and this for females only.

The difference in retention rates between low and high gap values for the *Admissions and Financial Aid* scale was 8% for males without disabilities, with an even steeper drop for females with disabilities (20%). The drop for males with disabilities, although steep (15%), was not significant as the sample size was small. The difference of 2.1% for females without disabilities was not significant, although the direction of the difference was the same as for the other groups. The *Instructional Effectiveness* scale, which was significantly correlated with retention for females without disabilities only, showed a difference in retention of 5.9%, and this became non-significant when co-varied with grades. However, the *Admissions and Financial Aid* gap variable remained significant for males without disabilities and females with disabilities, even when adjusted for grades.

9. Do Students who have higher overall satisfaction scores on the SSI experience their college studies as easier (i.e., will they have higher scores on the *Cegep/College Experience Questionnaire (CEQ)*).

There was support for our hypothesis that there was a correlation between CEQ scores and Overall Satisfaction (OS). When the CEQ scale averages were plotted for each level of the OS variable for all students in the sample, the average *Cegep* and *Personal* scale averages increased at higher levels of the OS variable (i.e. students who found their experiences more facilitating were more satisfied).

When the Low OS (levels 1 - 4) and High OS (levels 5 – 7) groups were compared, there were significant differences in *Personal* scale means for both males and females without disabilities, and in *Cegep* scale mean for females only. Moreover, the male slope was steeper than that of females on the *Personal* scale, indicating a potentially greater impact of *Personal* factors on the satisfaction of males compared to females.

The items showing the highest correlations with OS for males were *Previous Educational Experience* ( $r = .34$ ) and *Friends* ( $r = .33$ ), followed by *Level of Personal Motivation* ( $r = .30$ ), all on the *Personal* scale. Males who found these factors more facilitating were more satisfied. Although the overall *Cegep* scale average was not significantly correlated with

OS for males, two items on the scale were correlated. These were *Attitudes of professors* ( $r = .241$ ) and *Attitudes of students* ( $r = .279$ ).

The items showing the highest correlation for females were *Willingness of professors to adapt courses to my needs* ( $r = .27$ ) and *Attitudes of non-teaching staff* ( $r = .23$ ), both items occurring on the *Cegep* scale. The most important *Personal* scale items for females were *Financial Situation* ( $r = .209$ ) and *Paid Employment* ( $r = .210$ ),

Although it was not possible to do a comparison of students with disabilities by sex for High OS and low OS groups due to the low sample size, an overall comparison of students with disabilities was undertaken. The outcome suggests that *Cegep* factors may be more important than *Personal* factors in influencing the satisfaction of students with disabilities, as only the *Cegep* scale mean showed a significant difference between Low and High OS. However, this may have been due to the higher number of females in the sample.

In the correlation analysis, two individual items on the *Cegep* scale showed significant correlations with the OS variable: *Availability of computers on campus* (for males only) and *Availability of Course Materials* (for females only). One CEQ item, related to private tutoring outside the college, which was not associated with either the *Personal* or *Cegep* scales, was strongly correlated to OS for a subset of students with disabilities. *Availability of Course Materials*, although not significant in the correlation analysis, did enter the linear regression model (on OS) for males.

*10. Both SSI and CEQ scores, which measure post-entry factors, will improve the models of attrition and academic performance that we developed using pre-entry characteristics.*

Although the results are inconclusive due to the small sample sizes for the CEQ respondents, the data suggests that the CEQ *Personal* scale and the SSI overall satisfaction variable (OS) are similar in their ability to predict retention. Neither are strong predictors, but both produce results on their own that are similar to the models using high school grades.

## 16 Discussion

### *Satisfaction – Comparison by Sex*

We found that male satisfaction scores fell below those of females on virtually all seventy-three single SSI items, twelve subscales, and the overall satisfaction score. This was true for our study sample (both students with and without disabilities) as well as for the Canadian National and the Community College data sets obtained from Noel-Levitz. Moreover, in our sample, this difference in satisfaction between the sexes persisted even when grades were taken into account.

Our study suggests that the difference in satisfaction between the sexes, at least as measured by the Noel-Levitz Student Satisfaction Survey (SSI) may, in fact, be a reflection of a general tendency by males to rate their satisfaction lower than females, rather than to actual differences in the areas where they were satisfied. This contention is supported by the fact that, for all samples tested, the peaks and troughs of satisfaction on the scales were the same for both sexes, and the average item scores of males and females were highly correlated (i.e., males and females were satisfied/dissatisfied with the same aspects of their college experience). This lack of substantive differences in the relative satisfaction of males and females, in the face of differences in the absolute measures on the SSI, has implications for institutions using satisfaction as a key performance indicator, and for those trying to improve retention and academic performance of male students. Closing the gap in satisfaction between males and females, at least as measured by the SSI, is not likely to be successful in reducing the sex differences in academic performance or retention. Moreover, when satisfaction is used as a key performance indicator, differences in satisfaction among institutions may well be influenced by the relative proportions of males to females in their student populations.

Benjamin and Hollings (1997) argued that models of student satisfaction tend to be narrowly focused, linear, and insufficiently complex as they operate on a single level (e.g., a student in a single context, for example, a university campus). They proposed an ‘ecological model’ that distinguished between campus satisfaction and life satisfaction. In this more complex model they found that although males and females shared broad



similarities, there were some consistent differences in how they made sense of their experiences. Females tended to take a holistic approach to their university experience. For males, on the other hand, the strongest influences on satisfaction were related to recent events and how they felt about themselves - aspects not addressed by the SSI.

#### *Satisfaction - Comparison by Disability*

Although one of our hypotheses was that students with and without disabilities would express the same levels of satisfaction, this was not consistently supported by the data. Students with disabilities had lower satisfaction scores than those without disabilities, and this was true for both males and females. Six of the SSI scales showed significantly lower satisfaction for males and/or females with disabilities compared to peers without disabilities. These differences in satisfaction persisted even when controlling for the effect of grades. However, when scores of students with disabilities who had registered with the campus based disability services office were compared to those of students who did not register, the outcomes depended on sex and whether the student had a learning disability and/or attention deficit disorder (LD/ADD) or a disability other than LD/ADD.

#### *Satisfaction and Registering for Campus Based Disabilities Services*

Females, both those with LD/ADD and with 'Other' disabilities, who had registered for services were as satisfied as their non-disabled peers, whereas those who did not register were generally less satisfied (on at least two of the twelve SSI scales, although all twelve scales showed lower satisfaction scores for females with disabilities).

Males with disabilities other than LD/ADD who had registered for disability related services were generally as satisfied as males without disabilities, and in some areas they were even more satisfied. On the other hand, males with LD/ADD, whether or not they registered for disability service, showed no significant differences in satisfaction when compared to males without disabilities. However, despite the lack of statistical significance, all differences between males with LD/ADD and males without disabilities were in the negative direction regardless of service registration, and the pattern suggests that males with LD/ADD are in fact less satisfied than their non-disabled peers regardless

of whether or not they register for services. The largest differences between males with LD/ADD who did not register for services and males without disabilities were on the *Campus Support Services*, *Academic Advising* and *Admission and Financial Aid* scales. Analysis of data on males with LD/ADD was based on low numbers in the unregistered group (N = 23), and the findings need to be interpreted with caution. Nevertheless, these are possible areas where interventions may be of benefit.

The findings suggest that registering for disability related services results in satisfaction levels that are either higher than, or equivalent to those of non-disabled students for females with all types of disabilities as well as for males who fell in the 'Other' disabilities grouping. Registration for these services appeared to have little impact on males with LD/ADD.

It appears then, that males with LD/ADD respond differently than other students with disabilities who register for disability services. This may be due to differences in personality and help-seeking behaviors. The reasons for these differences need to be further explored to better understand the needs of this group. It may be that different modes of service delivery for males with LD/ADD have to be put in place and evaluated. Unfortunately, little work has been done on satisfaction of students with disabilities, let alone on sex differences and disability type. The one Quebec study we did find (AQICEBS, 2008) did not evaluate sex differences by disability type, and all students in the sample had registered for disability related services at universities in Quebec.

#### *Benefits of Registering for Disability Related Services*

Of the fourteen SSI items where females with disabilities who had registered for disability related services scored higher than those who did not register, three centered on registration for courses: *The personnel involved in registration are helpful*, *Classes are scheduled at times that are convenient for me* and *Student recruitment and admissions personnel respond to prospective students' unique needs*. At the college where the present study was carried out, students with disabilities are permitted to pre-register with the office for students with disabilities. In doing so, they are able to select their courses early with the

assistance of staff who may guide them to those teachers who are most likely to be helpful in accommodating their disability. This also allows students to arrange their class schedules at times that are most convenient for them. Thus, this personalized assistance with registration is likely reflected in the higher satisfaction in these areas for females who registered for campus disability related services.

It also appears that registration for disability related services creates a sense of connection with the institution for females that is reflected in higher satisfaction with the item: *Most students feel a sense of belonging here*. Registered females also felt more satisfied than females with disabilities who had not registered on the item: *Student success/academic support services adequately meet the needs of students*. This may be attributed to the guidance and support provided by the disability services staff, and the initiative they take in referring students to other college services available (e.g., counseling, academic advising, tutoring). Reed, Ryerson, and Lund-Lucas (2006), in examining the experiences of students with learning disabilities at two Ontario universities, reported that some students felt isolated, and that university life required a degree of adjustment. In our survey, one of the reasons provided by students with disabilities for dropping was that they felt alone and isolated when entering college (Jorgensen, Fichten, & Havel, 2009). The campus disability services office can play a role in helping students make the transition from high school to college more easily.

Another area where females who had registered for disability related services felt more satisfied than those who had not registered concerns finances: *Adequate financial aid is available for most students at this institution. Student awards/financial aid staff are helpful and There are convenient ways of paying my tuition/registration and other institutional fees*. There again differences, may be related to information received through the college office for disability related services which is able to make students aware of the sources of financial aid available to them, and guide them through the steps necessary to obtain this.

Satisfaction of females with disabilities who had registered for services was also higher in the area of communication: *I generally know what's happening on this campus*; and

*Students are notified early in the term if they are doing poorly in a class.* Males with disabilities who had registered for disability related services also had higher satisfaction scores than males who did not register on two items relating to communication: *I generally know what's happening on this campus* and *I seldom get the "run-around" when seeking information on this campus.* It appears then, that the office for disability services has an important role to play in helping students keep informed about what is happening on campus.

Males who had registered for disability related services felt more satisfied with the institution's commitment to *Commuters* and to *Students with special needs* than did those who had not registered. They also had higher scores on the items: *Personal counseling staff care about students as individuals* and *Academic advisors/counselors are concerned about my success as an individual.* Again, this could be a reflection of the initiative the office for students with disabilities takes in referring students to other campus services (e.g., counseling, academic advising, tutoring). Other areas where registered males were more satisfied are more pragmatic: *The amount of student parking space is adequate;* and *The student centre/lounge areas are comfortable places for students to spend their leisure time.*

Differences between males and females with disabilities in general, and between males and females with LD/ADD specifically, emphasize the need to recognize and respond to the diverse needs of different student groups (Benjamin and Hollings, 1995).

### *Satisfaction and Retention*

In our study, the retention rate was on average 10% higher for students who were most satisfied (scored 7 on the overall satisfaction (OS) scale) compared to those who were least satisfied (scored 1 on the OS scale). In fact, there appeared to be a linear relationship between retention and satisfaction, at least between the values of 3 and 5 on the OS scale. However, the line was flat at satisfaction scores above 5 and below 3, suggesting that satisfaction levels that are higher than 5 do not make any additional contribution to retention. Similarly, scores below 3 do not appear to make any additional contribution to dropping out. The logistic regression models we developed to assess the ability to predict

student persistence using overall satisfaction (OS), although statistically significant, showed minimal ability discriminate between the two groups, as they predicted only between 1% and 12% of the variability in persistence. Overall satisfaction was a better predictor of retention for students with disabilities. Our prediction models resulted in AUCs (areas under the curves generated by the logistic regression) of between .54 and .68, and these percentages are considered as either fail or poor. Our results are consistent with those obtained by Blecher, et al. (2002) and Blecher (2006) who, when looking at persistence at a systemic level, found only a weak relationship, or none at all, between satisfaction and five and six-year persistence rates at four year bachelor degree institutions.

Schreiner's study (2009), which examined the relationship between satisfaction and retention in a sample of 65 four-year institutions and over 27,000 students, found that satisfaction explained between 9% and 25% of the variability in retention. In the Schreiner study, the areas under the curves ranged from .65 (poor) to .74 (fair), depending on the SSI satisfaction variables used. They found that the strongest predictors were the individual items, and the gap scores for the most important items. In our modeling, we also used the SSI overall satisfaction variable and gaps between importance and satisfaction for selected items. Although, there were statistically significant relationships with retention for some of these, in our sample none had a stronger association with retention than the overall satisfaction variable.

A possible reason why in Schreiner's (2009) study the Nagelkerke  $R^2$  values and AUCs were somewhat higher than those we observed may be related to the fact that our study did not distinguish between the year of study. For example, the Schreiner study showed differences between the aspects of satisfaction that influenced retention of first year students (e.g., advisor availability, safety and security) and those influencing retention of senior students. For senior students, retention was less closely linked to satisfaction than to other factors (e.g., grades). Nonetheless, Nagelkerke  $R^2$  values of .09 - .25 cannot be considered strong. In our study, once grades were taken into consideration, retention rates did not differ, for different levels of satisfaction for the groups we investigated, with the exception of males with disabilities. Moreover, grades proved to be the best predictor of

retention, with areas under the curve that rated good to excellent in the logistic regression models we constructed.

One of the reasons why satisfaction is not as strongly linked to retention as one might have expected may be found in the work of Hatcher, Kryter, Prus and Fitzgerald (1992). These authors were the first to apply an investment model to the study of student retention. Here, a distinction is made between satisfaction and institutional commitment (intention to remain enrolled, independent of satisfaction with the college). Although commitment is influenced by satisfaction, it is also affected by two other variables: alternative value (attractiveness of other options available to the students, such as dropping out and getting a job) and investment size (amount of time, effort and resources already invested in enrolment at college). Students' enrolment behavior is linked to their overall commitment. The investment model predicts that students are most likely to stay enrolled when satisfaction is high, alternatives are limited, and investments are heavy. The SSI measures only the satisfaction component of the model. It does not consider the other components. In fact, it could be argued that the reason Schreiner (2009) found a weaker link between satisfaction and retention for senior students was because the investments senior students had already made in their education tended to predominate.

Many educational institutions focus on remediating areas of student dissatisfaction with the college environment, with the belief that this will result in improved retention and academic performance. Although our study did show statistically significant links between student satisfaction with the college environment and improved retention rates and grades, consistent with other studies, the correlations, effect sizes and predictive ability of the models we developed were low.

### *Satisfaction and Grades*

In their study of university students, Bean and Bradley (1986) found that for women, the effect of grades on satisfaction was stronger than the effect of satisfaction on grades, and therefore, the relationship between grades and satisfaction was reciprocal. For men, they found a non-reciprocal relationship, where there was no effect of satisfaction on grades, but a slight effect of

grades on satisfaction. Our study did not investigate the reciprocity of the relationship between grades and satisfaction. We did find, however, that there was a statistically significant correlation between grades and overall satisfaction for both females and males without disabilities. In addition, seven of the twelve satisfaction scales showed significant correlations with grades for females without disabilities, although only three did so for males. For females with disabilities low overall satisfaction and low satisfaction on the *Safety and Security* scale were significantly related to lower grades. There was no significant relationship between grades for males with disabilities on either overall satisfaction, or on any of the SSI satisfaction scales. In fact, for both sexes the relationships between grades and satisfaction were weak or non-existent, regardless of the presence of a disability. The largest correlation of grades with overall satisfaction was .21, and this for females with disabilities.

#### *Decision to Enroll Again*

The importance of measuring satisfaction has largely emerged from consumer research. If customers are not satisfied, it is argued, they are unlikely to recommend or repurchase a product or service, and they will seek out alternative suppliers. Similarly, dissatisfied students are unlikely to recommend the college or university to families and friends or re-enroll to pursue further studies. Thus, a student's satisfaction or dissatisfaction with his or her college can have a negative impact on how the institution is perceived in the community; and this of course, can influence future recruitment (Douglas, McClelland & Davies; 2007, Kara & Shield, 2004; Bolton 1998, Upcraft & Schuh, 1996; Shreiner, 2009; Serenko, 2011). Consequently, loyalty to the institution or program of study after graduation, as indicated by intention to enroll again, is a reflection of how satisfied students and graduates are with their college experiences.

The SSI addresses this issue by asking students: *All in all, if you had to do it over, would you enroll here again?* Students with positive feelings about the institution are likely to say they would enroll again, if they had a choice, and speak positively to family and friends about their experiences. Arguments can be made, therefore, for measuring student satisfaction despite its limited value in predicting retention because it is related to the

reputation the college enjoys in the community, its ability to recruit students in the future and the probability of current students and graduates returning to pursue other programs.

When we explored the relationship between satisfaction and student responses to the question concerning their '*decision to enroll again*' given the opportunity, we found results similar to those of Schreiner (2009), who found that a total of 45% to 47% of the variation in students' desire to enroll again was accounted for by (1) the SSI scales (35%) and (2) background variables (10% to 12%). *Campus Climate* was the most predictive scale, as was the case in our study, where it accounted for 31.3% of the variability with the remaining scales contributing an additional 4.7%. However, the single overall satisfaction variable had the highest correlation with the '*decision to enroll again*' question (r scores ranged from .63 to .73). The amount of variability explained by overall satisfaction, alone, depended on the group: it ranged from 40.1% to 53.4%, and was higher for males and females with disabilities than for those without disabilities.

Moreover, most of the variability in the '*decision to enroll again*', for all groups, could be accounted for by a single item: *It is an enjoyable experience to be a student on this campus* (this was also the variable most highly correlated with overall satisfaction). It accounted for approximately 30% of the variability in the '*decision to enroll again*' for males and females without disabilities as well as for females with disabilities, and for 40% of the variability for males with disabilities.

Making students feel welcome on campus, caring and supportive services staff and faculty, creating a sense of belonging, and an environment where students can experience intellectual growth all contributed to students having an enjoyable experience on campus. Douglas and McClelland (2007), using a more qualitative approach, found that attitudes, communication and responsiveness were important determinants of satisfaction /dissatisfaction. Gibson (2010), in reviewing factors that contributed to business student satisfaction, also found that non-academic factors, such as feeling of a sense of belonging and how students perceived the responsiveness and concern of staff were significantly



associated with overall satisfaction. Roberts and Styron (2009), found that low satisfaction with faculty approachability was associated with higher attrition.

Our findings, therefore, support the contention that satisfaction may be important in relation to students' loyalty to the college (as evidenced by responses to the '*decision to enroll again*' question) and, as a consequence, its reputation in the community and its ability to attract students in the future.

#### *Cegep/College Experience Questionnaire (CEQ) and Correlation with Satisfaction*

For males without disabilities, responses on the CEQ suggest that *Personal* factors rather than *College* factors had a greater impact on overall satisfaction. For females, both were important. This is consistent with the work of Bean and Bradley (1986), who found that institutional fit was significantly more likely to affect satisfaction of women than men.

Scores on many of the CEQ items were correlated with the overall satisfaction variable. When we conducted a linear regression of overall satisfaction against the *Personal* and *College* items on the CEQ separately for females and for males with and without disabilities, the variables entering the model varied by sex and disability.

For females without disabilities, three of the CEQ items that were most strongly correlated with overall satisfaction, were also correlated with the item asking students whether 'they would enroll again given the opportunity. These were: *Willingness of professors to adapt courses to my needs* (College factors); *Financial situation*; and *Attitudes of students* (both *Personal* factors).

For males without disabilities, two *Personal* factors, *Friends* and *Previous educational experiences* explained 17% of the variability in overall satisfaction. However, *Motivation* was more important in explaining the variability in the '*the decision to enroll again*' .

For females with disabilities, *Availability of course materials* accounted for 11% of the variability in overall satisfaction. For males with disabilities, *Availability of computers on*

*campus* was particularly important, and accounted for 44% of the variability in overall satisfaction. *Availability of course materials* was also important for males, and explained an additional 11.8% of the variability. The only score which correlated with the ‘*decision to enroll again*’ for students with disabilities was *Availability of computers on campus*, and this for males only, where it accounted for 43.8% of the variability.

#### *Cegep/College Experience Questionnaire (CEQ) and Correlation with Retention*

Although the CEQ scales and several of the item variables were correlated with overall satisfaction and with the ‘*decision to enroll again*’ variable, only the *Personal* scale was correlated with retention, and only two items on this scale had important relationships with retention: *Attitudes of fellow students* and *Previous educational experience*.

#### *Instructional Effectiveness*

Given the importance of instructional effectiveness to all students, regardless of sex or disability, colleges need to focus on this aspect of the educational experience. This is especially important for students with disabilities, since specific strategies are required to enhance the relationship between teachers and these students. This can be done through staff development programs designed to help teachers recognize how different teaching methods impact on students with disabilities, develop more flexible modes of delivery and consider students with disabilities when preparing course outlines

Students, themselves, need to be coached in self-advocacy skills. Self-advocacy is described in the Secondary Transition Guide for students entering Humber College Institute of Technology and Advanced Learning (2008) as, “*understanding your strengths and needs, identifying your personal goals, knowing your legal rights and responsibilities, and communicating these to others.*” In this way students can develop the confidence to approach their teachers effectively and express their needs. Students with disabilities also need to be trained on how to use information and communication technologies that can help them overcome disadvantages associated with their disability.

### *Direct and Indirect Measures of Satisfaction*

There is a large difference in the variability that is explained by OS and the SSI scale and item variables for the indirect measure of satisfaction (i.e. whether a student would *enroll again*) compared to the direct measure (i.e., the actual number of students retained). This raises an important question: Do students leave, primarily, not because there are major sources of dissatisfaction with their institutions, but for other reasons? The present results suggest that important aspects related to retention are not being measured by satisfaction, and that many of these are unrelated to the college environment. These include, for example, concepts measured by the Cegep/College Experience Questionnaire (CEQ) *Personal* scale, such as health, emotional or mental problems, financial situation, degree of family support, educational preparation, social relationships, and life events. For example, Bar-Telford et al. (2003), using data from the Post-Secondary Education Participation survey, found that when students were asked the reasons why they left, the main reasons cited were lack of interest or motivation and being unsure about what they wanted to do - reasons not addressed by the SSI. Motivation, for example, was an important predictor of whether males in our sample would enroll again. Financial reasons cited in the Bar-Telford study included the inability to get a loan, and wanting or needing to work. Jorgensen, Fichten, and Havel (2009) found similar reasons for leaving post-secondary education. As Pattendale (2006) states, “*while student satisfaction surveys are effective in identifying areas in which students are dissatisfied with an institution, it is misleading to assume that removing these dissatisfactions is the best way to improve student retention.*”

The results of the present study suggest that students who left were those who perceived their studies to be more difficult due to personal, rather than to college related factors. Those who left were also those who entered college with lower high school grades, received poorer college grades, and were less satisfied than students who were retained. Although students with high grades are most likely to be retained, not all student with low incoming high school averages and low college grades drop out. Conversely, not all students with high grades in high school and college are retained, although the probability of them doing so is higher.

Since retention is a complex phenomenon, many aspects of a student's life may influence the decision to stay or leave post-secondary education. Some of these are beyond institutional control, and may be related to the specific life circumstances of individual groups (e.g., students with disabilities, immigrant students, adult learners, distance learners). For example, Bean and Bradley (1986) found that grades and institutional fit were significantly more likely to influence satisfaction for women than for men. Similarly, in the present investigation we found that overall satisfaction was a better predictor of retention than high school grades for females with disabilities, but not for the other groups. In addition, we found that males with learning disabilities and/or attention deficit disorder (LD/ADD) had much lower retention rates when satisfaction was low and, unlike the other groups in our study, their satisfaction level was independent of grades. In addition, registration for campus disability related services did not appear to result in improvement in satisfaction of males with LD/ADD, as it did for females with LD/ADD and for students with other disabilities. The retention patterns and reasons why students with disabilities drop out differ from those of their nondisabled peers (Jorgensen, Fichten, & Havel, 2009), highlighting the need to study factors related to persistence unique to this population. Albert (2010) states that, "*retention efforts ignore the diversity that characterizes attrition causality and aggregate the data in ways that may mask the complex challenges to retention*" and questioned the value of measuring an aggregated retention rate and a "one size fits all approach" to interventions. In our study, despite the fact that males and females may have been generally satisfied with the same aspects of their college experiences, males had lower retention rates. Males and females also differed in the degree to which they believed *College* or *Personal* factors made their studies easier or harder, and in factors that influenced their decision to enroll again. Overall, the results of the present study suggest that in their efforts to improve retention, colleges need to target different groups whose responses to their environments differ as result of different life experiences.

## **17 Recommendations**

Care is required when interpreting student satisfaction as a key performance indicator. Since males appear to score satisfaction lower than females, comparisons between

institutions or different academic programs may be biased due to different proportions of males in the population.

Although males tended to score satisfaction lower than females, the item relating to equipment in the lab facilities being current had a larger than average difference and may be an area of concern for males more so than females, for both students with and without disabilities. Consequently, this area should be a focus of attention. These items may vary from institution to institution.

Larger than average differences in satisfaction were also found between males and females with disabilities with items relating to knowledge concerning what's happening on campus, the institution's commitment to part-time students, the reasonableness of class change (drop/add) policies, how new student orientation services help students adjust to college and how student recruitment and admissions personnel respond to prospective students' unique needs and requests. Males scored lower in all these areas. It is important to focus on these differences in order to understand why male and female perceptions differ in these areas.

There was clear evidence that the majority of students with disabilities who register for campus disability services were more satisfied, and found their studies easier, than students with disabilities who did not register. Consequently, students with disabilities need to be made aware of the services available to them. It may be necessary to find new ways of promoting services to students with disabilities in order to make them more appealing.

The needs of males with LD/ADD need to be studied more carefully, as they were the least satisfied of the groups we studied, even when registering for disability services. This suggests that males with LD/ADD respond to services differently than other students with disabilities who register for disability services. Among other factors, this may be due to differences in personality and help-seeking behaviors of this group, and reasons for these differences need to be determined in order to better understand the needs of these students. It may be that different modes of delivery of services to males with LD/ADD are required.

As *Instructional Effective* ranked highest in importance for all groups we studied, and had one of the largest gaps (difference between importance and satisfaction), the satisfaction of students in this area needs to be given special consideration. Since retention rates do not increase to any great extent when satisfaction reaches above a certain level on the SSI scale, items that have scores below five need to be a priority. These may vary depending on the institution. In this study the items with the lowest satisfaction with *Instructional Effectiveness* for males and females (with satisfaction scores between 4.70 and 4.80) were related to interactions with faculty (*Faculty are understanding of students' unique life circumstances; Faculty are interested in my academic problems; Faculty take into consideration student differences as they teach a course*).

Most of the variability in the indirect measure of satisfaction, whether the student would enroll again if given the opportunity, was accounted for by one item which had the highest correlation with overall satisfaction: *It is an enjoyable experience to be a student on this campus*. This was true for males and females with and without disabilities. Making students feel welcome on campus, caring and supportive service staff and faculty, creating a sense of belonging and an environment where students can experience intellectual growth, all contributed to overall satisfaction, and students having an enjoyable experience on campus. Maintaining high satisfaction in these areas is important, as these are the most important factors influencing the student's perceptions of their college as providing a positive and enjoyable educational experience. How students relate these experiences to friends and family will ultimately have an impact on the institution's reputation within the community.

*Availability of computers on campus* (for males with disabilities only) and *Availability of Course materials* for both females and males with disabilities, were important for the overall satisfaction for these two groups. These areas need to be managed in a way that supports the special needs of males and females with disabilities.

One CEQ item, related to private tutoring outside the college, and not associated with either the *Personal* or *Cegep* scales, was strongly correlated to OS for a subset of students

with disabilities. Students with disabilities should be made aware of the benefits of private tutoring, and information concerning the availability of this service made available to them.

## **18 Limitations of the Study**

The Student Satisfaction Inventory (SSI) data used in the retention and grades analyses were obtained at a single institution and, therefore, it is not appropriate to generalize to other post-secondary institutions. In addition, satisfaction was measured for all students who completed the SSI survey. No distinction was made between first year and later year students. This cross-sectional ‘snapshot’ does not take into consideration that a student’s perceptions may evolve over time, and that they may become more or less satisfied with their college experience as they advance in their studies.

Some students who were considered to have left their studies at the college, may have gone on to study at another institution and, therefore, the retention rate was lower than it would have been had these students been included as retained. This may have impacted on the ability of our models to discriminate between those who stayed and those who left their studies.

In addition, the retention rate was based on a variable number of years. This was because all students who were enrolled in each of the survey years were evaluated as either retained or dropped out in the autumn semester of 2009.

The Cegtep/College Experience Questionnaire (CEQ) was based on a small sample, reducing statistical power in calculations involved. In addition, the SSI and CEQ scores of students who replied to the surveys may have differed from those of students who did not reply and, therefore, suffer from non-response bias.

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**Satisfaction, and College Success**  
**A Comparison by Sex and Disability**

**Appendices to the Report**

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**Appendix 1. SSI Survey Items Included in Study**

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**Item Description**

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1. Most students feel a sense of belonging here.
  2. Faculty care about me as an individual.
  4. Security staff are helpful.
  5. The personnel involved in registration are helpful.
  6. Academic advisors/counsellors are approachable.
  7. Adequate financial aid is available for most students at this institution.
  8. Classes are scheduled at times that are convenient for me.
  9. Internships/work study or practical experiences are provided in my diploma
  10. Child care / day care facilities are available on campus.
  11. Security staff respond quickly in emergencies.
  12. Academic advisors/counsellors help me set goals to work toward.
  13. Scholarships and bursaries are announced to students in time to be helpful in
  14. Library resources and services are adequate.
  15. I am able to register for classes I need with few conflicts.
  16. The college shows concern for students as individuals.
  18. The quality of instruction I receive in most of my classes is excellent.
  20. Student awards/financial aid staff are helpful.
  21. There are a sufficient number of study areas available.
  22. People on this campus respect and are supportive of each other.
  23. Faculty are understanding of students' unique life circumstances.
  24. Parking lots are well-lit and secure.
  25. Academic advisors/counsellors are concerned about my success as an individual.
  26. Library staff are helpful and approachable.
  27. The campus staff are caring and helpful.
  28. It is an enjoyable experience to be a student on this campus.
  29. Faculty are fair and unbiased in their treatment of individual students.
  30. The career/placement services office provides students with the help they need
  31. The campus is safe and secure for all students.
  32. Academic advisor/counsellors are knowledgeable about my program
  33. Student recruitment and admissions personnel accurately portray the campus in
  34. Computer labs are adequate and accessible.
  35. Policies and procedures regarding registration and course selection are clear and
  36. Students are made to feel welcome on this campus.
  37. Faculty take into consideration student differences as they teach a course.
  38. The student centre/lounge areas are comfortable places for students to spend
  39. The amount of student parking space is adequate.
  40. Academic advisors/counsellors are knowledgeable about the transfer
  41. Student recruitment/admissions staff are knowledgeable.
  42. The equipment in the lab facilities is kept up to date.
  43. Class change (drop/add) policies are reasonable.
  44. I generally know what's happening on this campus.
  45. This institution has a good reputation within the community.
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**Appendix 1. SSI Survey Items Included in Study**

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**Item Description**

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46. Faculty provide timely feedback about student progress in a course.
  47. There are adequate services to help me decide upon a career.
  48. Personal counselling staff care about students as individuals.
  49. Student recruitment and admissions personnel respond to prospective students'
  50. Tutoring services are readily available.
  51. There are convenient ways of paying my tuition/registration and other
  52. The institution does whatever it can to help me reach my educational goals.
  53. The assessment and course placement/equivalence granting procedures are
  54. Faculty are interested in my academic problems.
  55. Student success/academic support services adequately meet the needs of
  56. The business/administration office is open during hours which are convenient
  57. Administrators are approachable to students.
  58. Nearly all of the faculty are knowledgeable in their fields.
  59. New student orientation services help students adjust to college.
  60. Billing policies are reasonable.
  61. Faculty are usually available after class and during office hours.
  62. Bookstore staff are helpful.
  63. I seldom get the "run-around" when seeking information on this campus.
  64. Nearly all classes deal with practical experiences and applications.
  65. Students are notified early in the term if they are doing poorly in a class.
  66. Program requirements are clear and reasonable.
  67. Channels for expressing student complaints are readily available.
  68. On the whole, the campus is well-maintained.
  69. There is a good variety of courses provided on this campus.
  70. I am able to experience intellectual growth here.
  81. Part-time students?
  82. Evening students?
  83. Older, returning learners?
  84. Minority populations?
  85. Commuters?
  86. Students with special needs?
-

**Appendix 2. SSI Scales** (\* *There was no Importance Item for Scale3*).

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<b>SSI Scale</b>	
1	Student Centeredness
2	Instructional Effectiveness
*3	Responsiveness to Diverse Populations
4	Campus Support Services
5	Safety and Security
6	Academic Advising/Counseling
7	Admissions and Financial Aid
8	Academic Services
9	Registration Effectiveness
10	Service Excellence
11	Concern for the Individual
12	Campus Climate

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### **Appendix 3. CEQ Item Numbers by Scale Included in the Study.**

#### **Personal Situation Scale**

Financial situation (11)

Paid employment (12)

Family situation (13)

Friends (14)

Level of personal motivation (15)

Study habits (16)

Previous education experiences (17)

Health (18)

Impact of my disability (19)

#### **Cegep Environment Scale**

Level of difficulty of courses (20)

Course load (21)

Attitudes of professors (23)

Attitudes of non-teaching staff (e.g., registration staff, financial aid staff) (24)

Attitudes of students (25)

Availability of computers on campus (26)

Training on computer technologies on campus (27)

Availability of course materials (28)

Opportunity to participate in Cegep extracurricular activities (e.g., clubs, sports, social activities) (29)

Willingness of professors to adapt courses to my needs (30)

Accessibility of building facilities (e.g., doorways, classrooms, labs) (31)

Accessibility of Cegep physical education courses (32)

Availability of disability related services at the Cegep (33)

#### **Government and Community Supports**

Availability of tutoring outside the Cegep (35)



**Appendix 4. Differences in Item Satisfaction by Sex - Males and Females Without Disabilities in DEC Programs.** (*Uses ANOVA; Sorted from Highest to Lowest Difference(Diff)*).

Study Sample No Disabilities DEC Programs Item Description	Females			Males			Diff		F	Sig		
	N	M	SD	N	Males	SD	M - F	df 1				df 2
42. The equipment in the lab facilities is kept up to date.	3037	5.57	1.35	1954	5.10	1.64	-0.47	1	4989	121.79	< .001	s
9. Internships/work study or practical experiences are provided in my diploma program.	2215	4.82	1.72	1448	4.54	1.73	-0.28	1	3661	23.54	< .001	s
30. The career/placement services office provides students with the help they need to get a job.	1802	5.00	1.39	1181	4.72	1.55	-0.28	1	2981	26.04	< .001	s
35. Policies and procedures regarding registration and course selection are clear and well-publicized.	3381	5.34	1.47	2118	5.06	1.58	-0.28	1	5497	43.48	< .001	s
50. Tutoring services are readily available.	2383	5.59	1.31	1547	5.32	1.44	-0.27	1	3928	37.78	< .001	s
43. Class change (drop/add) policies are reasonable.	3100	5.08	1.66	1929	4.83	1.72	-0.25	1	5027	26.85	< .001	s
8. Classes are scheduled at times that are convenient for me.	3415	4.88	1.59	2146	4.63	1.68	-0.25	1	5559	31.83	< .001	s
53. The assessment and course placement/equivalence granting procedures are reasonable.	3034	5.19	1.36	1883	4.95	1.43	-0.25	1	4915	36.56	< .001	s
46. Faculty provide timely feedback about student progress in a course.	3371	5.06	1.46	2086	4.81	1.51	-0.24	1	5455	34.83	< .001	s
13. Scholarships and bursaries are announced to students in time to be helpful in college planning.	2515	4.66	1.64	1544	4.42	1.61	-0.24	1	4057	19.99	< .001	s
16. The college shows concern for students as individuals.	3366	4.65	1.53	2100	4.42	1.57	-0.23	1	5464	28.87	< .001	s
47. There are adequate services to help me decide upon a career.	2912	4.97	1.52	1843	4.74	1.56	-0.23	1	4753	25.48	< .001	s
15. I am able to register for classes I need with few conflicts.	3363	4.71	1.78	2100	4.49	1.84	-0.22	1	5461	18.94	< .001	s
44. I generally know what's happening on this campus.	3342	5.19	1.43	2068	4.98	1.47	-0.21	1	5408	27.83	< .001	s
4. Security staff are helpful.	2897	4.90	1.42	1884	4.69	1.49	-0.21	1	4779	24.19	< .001	s
45. This institution has a good reputation within the community.	3329	5.47	1.36	2060	5.27	1.42	-0.20	1	5387	27.00	< .001	s
49. Student recruitment and admissions personnel respond to prospective students' unique needs and requests.	2600	5.05	1.25	1600	4.85	1.32	-0.20	1	4198	23.24	< .001	s
48. Personal counselling staff care about students as individuals.	2502	5.12	1.47	1608	4.93	1.50	-0.19	1	4108	16.11	< .001	s
24. Parking lots are well-lit and secure.	1253	4.51	1.54	963	4.32	1.69	-0.19	1	2214	7.55	.006	s
52. The institution does whatever it can to help me reach my educational goals.	3299	4.98	1.41	2056	4.81	1.53	-0.18	1	5353	18.63	< .001	s
7. Adequate financial aid is available for most students at this institution.	1957	4.90	1.52	1239	4.73	1.57	-0.17	1	3194	9.67	.002	s
18. The quality of instruction I receive in most of my classes is excellent.	3393	5.09	1.40	2124	4.92	1.46	-0.17	1	5515	18.57	< .001	s
34. Computer labs are adequate and accessible.	3350	5.14	1.65	2100	4.97	1.77	-0.17	1	5448	12.21	< .001	s
2. Faculty care about me as an individual.	3433	4.95	1.44	2155	4.79	1.52	-0.16	1	5586	14.98	< .001	s

**Appendix 4. Differences in Item Satisfaction by Sex - Males and Females Without Disabilities in DEC Programs.** (*Uses ANOVA; Sorted from Highest to Lowest Difference(Diff)*).

Study Sample No Disabilities DEC Programs Item Description	Females			Males			Diff		F	Sig		
	N	M	SD	N	Males	SD	M - F	df 1			df 2	
33. Student recruitment and admissions personnel accurately portray the campus in their recruiting practices.	2644	5.11	1.26	1682	4.96	1.32	-0.15	1	4324	14.95	< .001	s
36. Students are made to feel welcome on this campus.	3403	5.52	1.32	2115	5.37	1.37	-0.15	1	5516	15.92	< .001	s
20. Student awards/financial aid staff are helpful.	1873	4.90	1.41	1264	4.76	1.41	-0.14	1	3135	7.58	.006	s
51. There are convenient ways of paying my tuition/registration and other institutional fees.	3087	5.73	1.31	1937	5.60	1.38	-0.13	1	5022	11.87	.001	s
14. Library resources and services are adequate.	3390	5.75	1.30	2100	5.63	1.36	-0.12	1	5488	10.79	.001	s
23. Faculty are understanding of students' unique life circumstances.	3311	4.88	1.52	2046	4.76	1.55	-0.12	1	5355	7.61	.006	s
11. Security staff respond quickly in emergencies.	2004	5.15	1.34	1371	5.03	1.39	-0.12	1	3373	5.99	.014	s
1. Most students feel a sense of belonging here.	3437	5.12	1.39	2155	5.02	1.44	-0.10	1	5590	6.95	.008	s
32. Academic advisor/counsellors are knowledgeable about my program requirements.	2941	5.37	1.52	1821	5.27	1.52	-0.10	1	4760	4.74	.030	s
37. Faculty take into consideration student differences as they teach a course.	3347	4.81	1.38	2062	4.71	1.41	-0.10	1	5407	6.13	.013	s
31. The campus is safe and secure for all students.	3378	5.82	1.18	2084	5.73	1.27	-0.10	1	5460	8.14	.004	s
39. The amount of student parking space is adequate.	1351	3.60	1.75	1091	3.51	1.85	-0.09	1	2440	1.58	.208	
28. It is an enjoyable experience to be a student on this campus.	3395	5.53	1.35	2095	5.45	1.46	-0.08	1	5488	4.75	.029	s
41. Student recruitment/admissions staff are knowledgeable.	2691	5.20	1.27	1711	5.12	1.32	-0.08	1	4400	4.47	.035	s
12. Academic advisors/counsellors help me set goals to work toward.	2657	4.75	1.63	1641	4.69	1.62	-0.06	1	4296	1.45	.229	
27. The campus staff are caring and helpful.	3265	5.22	1.20	2046	5.16	1.27	-0.06	1	5309	2.92	.088	
38. The student centre/lounge areas are comfortable places for students to spend their leisure time.	3063	4.97	1.55	1919	4.92	1.52	-0.05	1	4980	1.12	.291	
29. Faculty are fair and unbiased in their treatment of individual students.	3353	5.04	1.46	2079	5.00	1.51	-0.04	1	5430	1.14	.286	
40. Academic advisors/counsellors are knowledgeable about the transfer requirements of other schools.	1888	4.90	1.57	1248	4.86	1.51	-0.04	1	3134	0.44	.506	
21. There are a sufficient number of study areas available.	3383	5.49	1.51	2101	5.46	1.49	-0.03	1	5482	0.67	.413	
25. Academic advisors/counsellors are concerned about my success as an individual.	2958	4.78	1.55	1835	4.75	1.54	-0.03	1	4791	0.48	.488	
10. Child care / day care facilities are available on campus.	1052	4.74	1.49	698	4.73	1.43	-0.01	1	1748	0.02	.875	
6. Academic advisors/counsellors are approachable.	3109	5.14	1.62	1909	5.13	1.61	-0.01	1	5016	0.04	.835	
26. Library staff are helpful and approachable.	3342	5.56	1.40	2041	5.56	1.36	0.00	1	5381	0.01	.924	

**Appendix 4. Differences in Item Satisfaction by Sex - Males and Females Without Disabilities in DEC Programs.** (*Uses ANOVA; Sorted from Highest to Lowest Difference(Diff)*).

Study Sample No Disabilities DEC Programs Item Description	Females			Males			Diff		F	Sig		
	N	M	SD	N	Males	SD	M - F	df 1			df 2	
5. The personnel involved in registration are helpful.	3331	4.94	1.65	2102	4.97	1.67	0.03	1	5431	0.34	.559	
22. People on this campus respect and are supportive of each other.	3406	5.02	1.41	2133	5.08	1.38	0.07	1	5537	3.00	.084	
54. Faculty are interested in my academic problems.	3209	4.88	1.50	2008	4.73	1.55	-0.15	1	5215	12.12	.001	s
55. Student success/academic support services adequately meet the needs of students.	2847	5.14	1.31	1794	4.92	1.35	-0.22	1	4639	30.70	<.001	s
56. The business/administration office is open during hours which are convenient for most students.	2708	5.08	1.45	1665	4.98	1.43	-0.10	1	4371	5.18	.023	s
57. Administrators are approachable to students.	2974	5.06	1.41	1843	4.87	1.47	-0.19	1	4815	19.84	<.001	s
58. Nearly all of the faculty are knowledgeable in their fields.	3332	5.46	1.34	2079	5.27	1.45	-0.18	1	5409	22.80	<.001	s
59. New student orientation services help students adjust to college.	2951	5.23	1.46	1804	5.03	1.45	-0.20	1	4753	20.16	<.001	s
60. Billing policies are reasonable.	3157	5.40	1.37	2011	5.19	1.47	-0.21	1	5166	27.06	<.001	s
61. Faculty are usually available after class and during office hours.	3349	5.50	1.35	2076	5.34	1.43	-0.17	1	5423	18.39	<.001	s
62. Bookstore staff are helpful.	3347	5.69	1.34	2070	5.46	1.46	-0.23	1	5415	35.29	<.001	s
63. I seldom get the "run-around" when seeking information on this campus.	3127	4.82	1.61	1945	4.73	1.65	-0.09	1	5070	3.63	.057	
64. Nearly all classes deal with practical experiences and applications.	3314	4.93	1.42	2047	4.66	1.52	-0.27	1	5359	42.60	<.001	s
65. Students are notified early in the term if they are doing poorly in a class.	3162	5.07	1.57	1992	4.81	1.62	-0.26	1	5152	32.43	<.001	s
66. Program requirements are clear and reasonable.	3358	5.62	1.30	2077	5.34	1.39	-0.27	1	5433	54.34	<.001	s
67. Channels for expressing student complaints are readily available.	2724	4.63	1.61	1739	4.39	1.65	-0.24	1	4461	22.23	<.001	s
68. On the whole, the campus is well-maintained.	3357	5.86	1.15	2075	5.74	1.24	-0.12	1	5430	12.90	<.001	s
69. There is a good variety of courses provided on this campus.	3347	5.85	1.22	2079	5.66	1.31	-0.19	1	5424	28.61	<.001	s
70. I am able to experience intellectual growth here.	3349	5.64	1.30	2084	5.41	1.43	-0.22	1	5431	35.06	<.001	s
81. Part-time students?	1367	5.26	1.32	920	5.00	1.37	-0.26	1	2285	21.02	<.001	s
82. Evening students?	1196	5.19	1.32	871	4.97	1.38	-0.21	1	2065	12.71	<.001	s
83. Older, returning learners?	1380	5.40	1.30	896	5.11	1.35	-0.28	1	2274	24.94	<.001	s
84. Minority populations?	1987	5.63	1.23	1323	5.38	1.34	-0.25	1	3308	29.53	<.001	s
85. Commuters?	2242	5.28	1.44	1544	5.21	1.50	-0.07	1	3784	2.12	0.146	
86. Students with special needs?	1696	5.86	1.22	1101	5.56	1.32	-0.30	1	2795	37.90	<.001	s

**Appendix 5. Differences in Item Satisfaction by Sex - Males and Females With Disabilities in DEC Programs.** (Uses ANOVA; Sorted from Highest to Lowest Difference(Diff) items where  $p < .05$  are shaded.).

Study Sample With Disabilities DEC Programs Item Description	Females			Males			Diff		df 1	df 2	F	Sig	
	N	M	SD	N	M	SD	M - F						
44. I generally know what's happening on this campus.	210	5.23	1.48	161	4.61	1.73	-0.61	1	369	13.48	<.001	s	
81. Part-time students?	91	5.12	1.48	87	4.60	1.54	-0.52	1	176	5.32	.022	s	
43. Class change (drop/add) policies are reasonable.	196	4.95	1.72	148	4.47	1.88	-0.48	1	342	6.14	.014	s	
59. New student orientation services help students adjust to college.	184	5.05	1.69	152	4.62	1.78	-0.43	1	334	5.15	.024	s	
10. Child care / day care facilities are available on campus.	56	4.95	1.44	56	4.52	1.57	-0.43	1	110	2.26	.136		
49. Student recruitment and admissions personnel respond to prospective students' unique needs and requests.	164	5.05	1.40	131	4.65	1.48	-0.41	1	293	5.84	.016	s	
42. The equipment in the lab facilities is kept up to date.	176	5.41	1.57	152	5.03	1.78	-0.38	1	326	4.27	.040	s	
1. Most students feel a sense of belonging here.	214	5.17	1.41	167	4.79	1.58	-0.38	1	379	6.06	.014	s	
70. I am able to experience intellectual growth here.	210	5.49	1.44	169	5.12	1.59	-0.36	1	377	5.37	.021	s	
53. The assessment and course placement/equivalence granting procedures are reasonable.	185	5.15	1.37	154	4.79	1.62	-0.35	1	337	4.77	.030	s	
83. Older, returning learners?	81	5.06	1.69	89	4.72	1.82	-0.34	1	168	1.61	.207		
36. Students are made to feel welcome on this campus.	210	5.28	1.52	168	4.94	1.64	-0.34	1	376	4.22	.041	s	
51. There are convenient ways of paying my tuition/registration and other institutional fees.	183	5.52	1.45	158	5.20	1.72	-0.32	1	339	3.53	.061		
69. There is a good variety of courses provided on this campus.	199	5.76	1.32	167	5.44	1.62	-0.32	1	364	4.22	.041	s	
39. The amount of student parking space is adequate.	87	3.78	2.07	90	3.47	1.89	-0.31	1	175	1.12	.291		
62. Bookstore staff are helpful.	206	5.50	1.51	165	5.19	1.74	-0.31	1	369	3.32	.069		
86. Students with special needs?	159	5.77	1.49	131	5.49	1.65	-0.29	1	288	2.39	.124		
84. Minority populations?	112	5.34	1.52	106	5.06	1.61	-0.28	1	216	1.77	.185		
66. Program requirements are clear and reasonable.	210	5.39	1.51	166	5.11	1.58	-0.28	1	374	3.01	.084		
60. Billing policies are reasonable.	191	5.23	1.53	161	4.95	1.71	-0.27	1	350	2.53	.113		
64. Nearly all classes deal with practical experiences and applications.	203	4.86	1.56	165	4.59	1.56	-0.27	1	366	2.69	.102		
55. Student success/academic support services adequately meet the needs of students.	180	5.13	1.45	145	4.87	1.42	-0.26	1	323	2.72	.100		
12. Academic advisors/counsellors help me set goals to work toward.	171	4.85	1.77	141	4.59	1.75	-0.26	1	310	1.68	.196		
25. Academic advisors/counsellors are concerned about my success as an individual.	186	4.98	1.64	148	4.72	1.74	-0.26	1	332	1.89	.170		
67. Channels for expressing student complaints are readily available.	171	4.45	1.68	140	4.21	1.74	-0.24	1	309	1.56	.213		

**Appendix 5. Differences in Item Satisfaction by Sex - Males and Females With Disabilities in DEC Programs.** (Uses ANOVA; Sorted from Highest to Lowest Difference(Diff) items where  $p < .05$  are shaded.).

Study Sample With Disabilities DEC Programs	Females			Males			Diff		F	Sig	
	N	M	SD	N	M	SD	M - F	df 1			df 2
16. The college shows concern for students as individuals.	211	4.72	1.64	166	4.48	1.67	-0.24	1	375	1.95	.163
68. On the whole, the campus is well-maintained.	205	5.70	1.26	167	5.46	1.46	-0.24	1	370	2.81	.095
23. Faculty are understanding of students' unique life circumstances.	213	4.91	1.62	164	4.67	1.67	-0.24	1	375	1.91	.168
38. The student centre/lounge areas are comfortable places for students to spend their leisure time.	196	4.65	1.70	151	4.42	1.77	-0.23	1	345	1.52	.219
50. Tutoring services are readily available.	153	5.31	1.57	133	5.09	1.59	-0.22	1	284	1.34	.247
58. Nearly all of the faculty are knowledgeable in their fields.	209	5.33	1.43	161	5.12	1.57	-0.22	1	368	1.93	.165
27. The campus staff are caring and helpful.	196	5.18	1.26	166	4.97	1.39	-0.21	1	360	2.36	.125
2. Faculty care about me as an individual.	215	5.05	1.55	170	4.84	1.66	-0.21	1	383	1.66	.199
15. I am able to register for classes I need with few conflicts.	210	4.94	1.79	165	4.74	1.75	-0.20	1	373	1.21	.271
24. Parking lots are well-lit and secure.	76	4.53	1.81	80	4.33	1.78	-0.20	1	154	0.49	.485
32. Academic advisor/counsellors are knowledgeable about my program requirements.	176	5.25	1.73	154	5.05	1.67	-0.20	1	328	1.11	.293
9. Internships/work study or practical experiences are provided in my diploma program.	136	4.88	1.83	105	4.70	1.68	-0.18	1	239	0.61	.434
82. Evening students?	73	4.95	1.50	89	4.78	1.57	-0.17	1	160	0.49	.486
63. I seldom get the "run-around" when seeking information on this campus.	194	4.63	1.71	155	4.46	1.83	-0.16	1	347	0.75	.388
54. Faculty are interested in my academic problems.	205	4.81	1.47	166	4.66	1.76	-0.16	1	369	0.89	.347
47. There are adequate services to help me decide upon a career.	174	4.84	1.74	141	4.70	1.79	-0.14	1	313	0.51	.475
65. Students are notified early in the term if they are doing poorly in a class.	197	4.73	1.73	159	4.60	1.80	-0.13	1	354	0.51	.477
48. Personal counselling staff care about students as individuals.	156	4.99	1.60	128	4.87	1.67	-0.12	1	282	0.38	.537
31. The campus is safe and secure for all students.	207	5.67	1.30	162	5.55	1.47	-0.12	1	367	0.66	.417
61. Faculty are usually available after class and during office hours.	211	5.29	1.41	167	5.17	1.73	-0.12	1	376	0.51	.474
41. Student recruitment/admissions staff are knowledgeable.	164	5.12	1.29	135	5.01	1.50	-0.11	1	297	0.51	.478
8. Classes are scheduled at times that are convenient for me.	213	5.00	1.61	167	4.89	1.73	-0.11	1	378	0.39	.531
33. Student recruitment and admissions personnel accurately portray the campus in their recruiting practices.	156	4.85	1.44	131	4.76	1.43	-0.09	1	285	0.27	.601
28. It is an enjoyable experience to be a student on this campus.	207	5.31	1.51	167	5.23	1.69	-0.09	1	372	0.27	.602
14. Library resources and services are adequate.	211	5.44	1.55	163	5.35	1.71	-0.09	1	372	0.26	.610

**Appendix 5. Differences in Item Satisfaction by Sex - Males and Females With Disabilities in DEC Programs.** (Uses ANOVA; Sorted from Highest to Lowest Difference(Diff) items where  $p < .05$  are shaded.).

Study Sample With Disabilities DEC Programs	Females			Males			Diff		F	Sig	
	N	M	SD	N	M	SD	M - F	df 1			df 2
45. This institution has a good reputation within the community.	208	5.29	1.51	162	5.21	1.57	-0.08	1	368	.27	.605
11. Security staff respond quickly in emergencies.	124	5.11	1.55	106	5.04	1.55	-0.08	1	228	.13	.714
46. Faculty provide timely feedback about student progress in a course.	210	4.74	1.50	163	4.67	1.60	-0.07	1	371	.21	.646
56. The business/administration office is open during hours which are convenient for most students.	167	4.83	1.50	134	4.75	1.69	-0.07	1	299	.15	.694
57. Administrators are approachable to students.	191	4.75	1.58	147	4.69	1.60	-0.07	1	336	.15	.701
26. Library staff are helpful and approachable.	201	5.41	1.60	161	5.34	1.64	-0.07	1	360	.15	.699
6. Academic advisors/counsellors are approachable.	197	5.12	1.76	157	5.07	1.72	-0.05	1	352	.08	.781
18. The quality of instruction I receive in most of my classes is excellent.	214	5.03	1.45	165	4.98	1.64	-0.05	1	377	.10	.750
35. Policies and procedures regarding registration and course selection are clear and well-publicized.	207	4.94	1.61	166	4.89	1.61	-0.05	1	371	.09	.764
2. Student awards/financial aid staff are helpful.	119	4.79	1.47	99	4.76	1.56	-0.03	1	216	.02	.875
52. The institution does whatever it can to help me reach my educational goals.	206	4.77	1.54	167	4.74	1.68	-0.03	1	371	.03	.855
21. There are a sufficient number of study areas available.	208	5.09	1.68	163	5.07	1.76	-0.02	1	369	.01	.915
7. Adequate financial aid is available for most students at this institution.	127	4.78	1.70	109	4.77	1.70	-0.01	1	234	.00	.968
4. Security staff are helpful.	184	4.86	1.48	147	4.89	1.68	.03	1	329	.02	.877
13. Scholarships and bursaries are announced to students in time to be helpful in college planning.	159	4.45	1.78	117	4.49	1.62	.03	1	274	.03	.870
34. Computer labs are adequate and accessible.	208	4.81	1.81	167	4.86	1.92	.04	1	373	.05	.821
85. Commuters?	137	4.98	1.66	137	5.02	1.74	.04	1	272	.05	.832
29. Faculty are fair and unbiased in their treatment of individual students.	207	4.88	1.64	164	4.93	1.60	.05	1	369	.10	.752
3. The career/placement services office provides students with the help they need to get a job.	124	4.72	1.50	97	4.84	1.59	.12	1	219	.32	.575
4. Academic advisors/counsellors are knowledgeable about the transfer requirements of other schools.	125	4.52	1.68	102	4.66	1.67	.14	1	225	.38	.541
5. The personnel involved in registration are helpful.	210	5.07	1.77	162	5.24	1.74	.17	1	370	.90	.345
37. Faculty take into consideration student differences as they teach a course.	208	4.53	1.49	165	4.77	1.61	.24	1	371	2.14	.144
22. People on this campus respect and are supportive of each other.	212	4.71	1.54	167	4.97	1.47	.26	1	377	2.72	.100

**Appendix 6. Community Colleges Differences in Female and Male Satisfaction – Sorted from Largest to Smallest Differences.**

**Community Colleges -**

11 (16.2%) of items had a difference 0.20 or higher between males and females, with males having lower satisfaction on all items. An estimated 79% (54) of items showed a statistically significant difference in satisfaction between females and males, and males scored lower than females on 73 items evaluated: Sorted in order of differences.

Appendix 6. Item Description	Females		Males		Diff
	Mean	SD	Mean	SD	M - F
9. Internships/work study or practical experiences are provided in my diploma program.	5.15	1.53	4.86	1.53	-.29
4. Security staff are helpful.	5.04	1.54	4.76	1.61	-.28
45. This institution has a good reputation within the community.	5.74	1.31	5.47	1.39	-.27
43. Class change (drop/add) policies are reasonable.	5.54	1.42	5.30	1.47	-.24
11. Security staff respond quickly in emergencies.	5.01	1.45	4.79	1.47	-.22
53. The assessment and course placement/equivalence granting procedures are reasonable.	5.39	1.40	5.18	1.43	-.21
7. I am able to experience intellectual growth here.	5.79	1.28	5.58	1.35	-.21
59. New student orientation services help students adjust to college.	5.32	1.47	5.11	1.47	-.21
5. Tutoring services are readily available.	5.49	1.44	5.29	1.42	-.20
35. Policies and procedures regarding registration and course selection are clear and well-publicized.	5.52	1.40	5.32	1.42	-.20
61. Faculty are usually available after class and during office hours.	5.68	1.35	5.48	1.39	-.20
13. Scholarships and bursaries are announced to students in time to be helpful in college planning.	4.98	1.69	4.79	1.62	-.19
68. On the whole, the campus is well-maintained.	5.83	1.28	5.64	1.35	-.19
42. The equipment in the lab facilities is kept up to date.	5.51	1.40	5.32	1.43	-.19
66. Program requirements are clear and reasonable.	5.59	1.36	5.40	1.37	-.19
28. It is an enjoyable experience to be a student on this campus.	5.59	1.38	5.40	1.44	-.19
64. Nearly all classes deal with practical experiences and applications.	5.49	1.32	5.31	1.38	-.18
62. Bookstore staff are helpful.	5.61	1.47	5.43	1.47	-.18
69. There is a good variety of courses provided on this campus.	5.66	1.40	5.48	1.43	-.18
1. Most students feel a sense of belonging here.	5.38	1.34	5.20	1.39	-.18
14. Library resources and services are adequate.	5.67	1.35	5.49	1.36	-.18
36. Students are made to feel welcome on this campus.	5.64	1.33	5.46	1.38	-.18
6. Billing policies are reasonable.	5.41	1.44	5.24	1.47	-.17
46. Faculty provide timely feedback about student progress in a course.	5.37	1.46	5.20	1.47	-.17
56. The business/administration office is open during hours which are convenient for most students.	5.44	1.43	5.28	1.43	-.16
38. The student centre/lounge areas are comfortable places for students to spend their leisure time.	5.29	1.46	5.13	1.47	-.16
26. Library staff are helpful and approachable.	5.58	1.39	5.43	1.38	-.15
33. Student recruitment and admissions personnel accurately portray the campus in their recruiting practices.	5.19	1.42	5.04	1.41	-.15
51. There are convenient ways of paying my tuition/registration and other institutional fees.	5.52	1.47	5.37	1.47	-.15
47. There are adequate services to help me decide upon a career.	5.27	1.47	5.12	1.46	-.15
49. Student recruitment and admissions personnel respond to prospective students' unique needs and requests.	5.23	1.47	5.09	1.43	-.14
15. I am able to register for classes I need with few conflicts.	5.49	1.51	5.35	1.50	-.14
41. Student recruitment/admissions staff are knowledgeable.	5.43	1.42	5.29	1.42	-.14

Appendix 6.	Females		Males		Diff
34. Computer labs are adequate and accessible.	5.63	1.44	5.49	1.44	-.14
7. Adequate financial aid is available for most students at this institution.	5.18	1.71	5.04	1.65	-.14
18. The quality of instruction I receive in most of my classes is excellent.	5.65	1.32	5.52	1.34	-.13
57. Administrators are approachable to students.	5.31	1.46	5.18	1.47	-.13
58. Nearly all of the faculty are knowledgeable in their fields.	5.71	1.30	5.58	1.33	-.13
55. Student success/academic support services adequately meet the needs of students.	5.32	1.38	5.19	1.36	-.13
31. The campus is safe and secure for all students.	5.58	1.33	5.46	1.36	-.12
22. People on this campus respect and are supportive of each other.	5.33	1.38	5.21	1.39	-.12
3. The career/placement services office provides students with the help they need to get a job.	5.06	1.44	4.94	1.43	-.12
27. The campus staff are caring and helpful.	5.48	1.32	5.37	1.32	-.11
8. Classes are scheduled at times that are convenient for me.	5.49	1.51	5.38	1.52	-.11
21. There are a sufficient number of study areas available.	5.43	1.51	5.32	1.49	-.11
44. I generally know what's happening on this campus.	4.99	1.52	4.89	1.53	-.10
65. Students are notified early in the term if they are doing poorly in a class.	4.96	1.71	4.86	1.68	-.10
52. The institution does whatever it can to help me reach my educational goals.	5.29	1.48	5.20	1.47	-.09
48. Personal counselling staff care about students as individuals.	5.22	1.54	5.14	1.49	-.08
2. Student awards/financial aid staff are helpful.	5.08	1.70	5.00	1.61	-.08
54. Faculty are interested in my academic problems.	5.22	1.47	5.14	1.45	-.08
37. Faculty take into consideration student differences as they teach a course.	5.26	1.46	5.18	1.44	-.08
29. Faculty are fair and unbiased in their treatment of individual students.	5.4	1.48	5.33	1.47	-.07
16. The college shows concern for students as individuals.	5.17	1.53	5.10	1.50	-.07
67. Channels for expressing student complaints are readily available.	4.94	1.62	4.88	1.57	-.06
32. Academic advisor/counsellors are knowledgeable about my program requirements.	5.38	1.65	5.32	1.57	-.06
63. I seldom get the "run-around" when seeking information on this campus.	5.13	1.64	5.07	1.59	-.06
23. Faculty are understanding of students' unique life circumstances.	5.25	1.53	5.19	1.49	-.06
4. Academic advisors/counsellors are knowledgeable about the transfer requirements of other schools.	5.15	1.65	5.10	1.57	-.05
3. The quality of instruction in the non-diploma/non-DEC programs is excellent.	5.42	1.32	5.38	1.34	-.04
12. Academic advisors/counsellors help me set goals to work toward.	5.04	1.72	5.00	1.62	-.04
2. Faculty care about me as an individual.	5.39	1.41	5.36	1.39	-.03
6. Academic advisors/counsellors are approachable.	5.41	1.62	5.39	1.54	-.02
24. Parking lots are well-lit and secure.	5.11	1.66	5.10	1.60	-.01
25. Academic advisors/counsellors are concerned about my success as an individual.	5.07	1.71	5.06	1.63	-.01
5. The personnel involved in registration are helpful.	5.36	1.56	5.35	1.51	-.01
1. Child care / day care facilities are available on campus.	4.43	1.74	4.51	1.49	.08
39. The amount of student parking space is adequate.	4.51	1.97	4.63	1.90	.12



**Appendix 7. Canadian Two – Year Colleges - Differences in Female and Male Satisfaction – Sorted from Largest to Smallest Differences.**

**Canadian 2 Year Colleges -**

17 (25%) items with a difference 0.20 or more between males and females

An estimated 78% (53) items showed statistically significant differences between females and males, and males had lower scores on all 17

73 items evaluated ; Sorted on differences in means

<b>Appendix 7</b>	<b>Females</b>		<b>Males</b>		<b>Diff</b>
	<b>Mean</b>	<b>SD</b>	<b>Mean</b>	<b>SD</b>	
<b>Item Description</b>					
42. The equipment in the lab facilities is kept up to date.	5.4	1.62	4.97	1.52	-.43
9. Internships/work study or practical experiences are provided in my diploma program.	4.92	1.83	4.55	1.82	-.37
86. Students with special needs?	5.66	1.36	5.3	1.44	-.36
6. Billing policies are reasonable.	5.36	1.38	5.05	1.38	-.31
83. Older, returning learners?	5.52	1.37	5.22	1.45	-.3
39. The amount of student parking space is adequate.	3.6	1.44	3.31	1.46	-.29
4. Security staff are helpful.	5.04	1.51	4.77	1.61	-.27
81. Part-time students?	5.32	1.38	5.05	1.47	-.27
43. Class change (drop/add) policies are reasonable.	5.24	1.36	4.98	1.37	-.26
51. There are convenient ways of paying my tuition/registration and other institutional fees.	5.65	1.34	5.39	1.36	-.26
85. Commuters?	5.1	1.61	4.84	1.73	-.26
5. Tutoring services are readily available.	5.28	1.5	5.03	1.44	-.25
68. On the whole, the campus is well-maintained.	5.65	1.37	5.4	1.41	-.25
59. New student orientation services help students adjust to college.	5.3	1.48	5.06	1.47	-.24
62. Bookstore staff are helpful.	5.54	1.46	5.3	1.55	-.24
84. Minority populations?	5.54	1.32	5.3	1.44	-.24
34. Computer labs are adequate and accessible.	4.97	1.49	4.74	1.44	-.23
53. The assessment and course placement/equivalence granting procedures are reasonable.	5.24	1.44	5.01	1.5	-.23
8. Classes are scheduled at times that are convenient for me.	5.06	1.61	4.85	1.62	-.21
11. Security staff respond quickly in emergencies.	5.06	1.45	4.85	1.47	-.21
66. Program requirements are clear and reasonable.	5.59	1.41	5.38	1.48	-.21
35. Policies and procedures regarding registration and course selection are clear and well-publicized	5.33	1.44	5.13	1.51	-.20
13. Scholarships and bursaries are announced to students in time to be helpful in college planning.	4.56	1.75	4.37	1.73	-.19
33. Student recruitment and admissions personnel accurately portray the campus in their recruiting practices.	5.11	1.23	4.92	1.28	-.19
44. I generally know what's happening on this campus.	5.09	1.5	4.9	1.68	-.19
45. This institution has a good reputation within the community.	5.58	1.61	5.39	1.62	-.19
46. Faculty provide timely feedback about student progress in a course.	5.1	1.49	4.91	1.52	-.19
56. The business/administration office is open during hours which are convenient for most students	5.19	1.53	5	1.52	-.19
1. Child care / day care facilities are available on campus.	4.41	1.82	4.23	1.69	-.18
24. Parking lots are well-lit and secure.	4.54	1.42	4.36	1.36	-.18
55. Student success/academic support services adequately meet the needs of students.	5.22	1.4	5.04	1.43	-.18
21. There are a sufficient number of study areas available.	5.09	1.57	4.93	1.66	-.16
49. Student recruitment and admissions personnel respond to prospective students' unique needs and requests.	5.18	1.52	5.02	1.53	-.16

<b>Appendix 7</b>	<b>Females</b>		<b>Males</b>		<b>Diff</b>
	<b>Mean</b>	<b>SD</b>	<b>Mean</b>	<b>SD</b>	
61. Faculty are usually available after class and during office hours.	5.46	1.5	5.3	1.47	-.16
65. Students are notified early in the term if they are doing poorly in a class.	4.84	1.67	4.68	1.62	-.16
69. There is a good variety of courses provided on this campus.	5.71	1.73	5.56	1.7	-.15
7. I am able to experience intellectual growth here.	5.71	1.36	5.56	1.47	-.15
64. Nearly all classes deal with practical experiences and applications.	5.26	1.44	5.12	1.52	-.14
14. Library resources and services are adequate.	5.48	1.56	5.35	1.54	-.13
36. Students are made to feel welcome on this campus.	5.62	1.79	5.49	1.86	-.13
82. Evening students?	5.2	1.41	5.07	1.48	-.13
52. The institution does whatever it can to help me reach my educational goals.	5.08	1.56	4.96	1.6	-.12
54. Faculty are interested in my academic problems.	5.08	1.45	4.96	1.49	-.12
3. The career/placement services office provides students with the help they need to get a job.	4.96	1.38	4.85	1.44	-.11
7. Adequate financial aid is available for most students at this institution.	4.86	1.65	4.76	1.64	-.10
16. The college shows concern for students as individuals.	4.93	1.58	4.83	1.58	-.10
28. It is an enjoyable experience to be a student on this campus.	5.56	1.42	5.46	1.4	-.10
41. Student recruitment/admissions staff are knowledgeable.	5.27	2	5.17	1.99	-.10
48. Personal counselling staff care about students as individuals.	5.23	1.54	5.13	1.56	-.10
1. Most students feel a sense of belonging here.	5.29	1.38	5.2	1.37	-.09
47. There are adequate services to help me decide upon a career.	5.05	1.38	4.96	1.39	-.09
57. Administrators are approachable to students.	5.25	1.4	5.16	1.37	-.09
2. Student awards/financial aid staff are helpful.	5.02	1.44	4.94	1.44	-.08
31. The campus is safe and secure for all students.	5.8	1.58	5.72	1.54	-.08
4. Academic advisors/counsellors are knowledgeable about the transfer requirements of other schools.	4.9	1.73	4.82	1.68	-.08
23. Faculty are understanding of students' unique life circumstances.	5.09	1.79	5.02	1.78	-.07
27. The campus staff are caring and helpful.	5.39	1.53	5.32	1.5	-.07
58. Nearly all of the faculty are knowledgeable in their fields.	5.6	1.52	5.53	1.49	-.07
67. Channels for expressing student complaints are readily available.	4.62	1.72	4.55	1.72	-.07
15. I am able to register for classes I need with few conflicts.	5.17	1.65	5.11	1.6	-.06
26. Library staff are helpful and approachable.	5.65	1.8	5.59	1.82	-.06
38. The student centre/lounge areas are comfortable places for students to spend their leisure time.	4.74	1.31	4.68	1.34	-.06
63. I seldom get the "run-around" when seeking information on this campus.	4.9	1.41	4.84	1.46	-.06
2. Faculty care about me as an individual.	5.19	1.45	5.14	1.43	-.05
18. The quality of instruction I receive in most of my classes is excellent.	5.27	1.57	5.23	1.66	-.04
32. Academic advisor/counsellors are knowledgeable about my program requirements.	5.46	1.51	5.43	1.56	-.03
37. Faculty take into consideration student differences as they teach a course.	4.98	1.47	4.96	1.49	-.02
12. Academic advisors/counsellors help me set goals to work toward.	4.91	1.63	4.91	1.51	.00
25. Academic advisors/counsellors are concerned about my success as an individual.	5.05	1.56	5.06	1.54	.01
6. Academic advisors/counsellors are approachable.	5.33	1.57	5.39	1.47	.06
5. The personnel involved in registration are helpful.	5.23	1.58	5.31	1.51	.08
29. Faculty are fair and unbiased in their treatment of individual students.	5.05	1.26	5.14	1.31	.09
22. People on this campus respect and are supportive of each other.	5.19	1.54	5.34	1.51	.15

**Appendix 8. Females With and Without Disabilities - Difference in Mean Satisfaction by SSI Scale – (Compared Using MANOVA.**

*\*Items showing statistical significance at  $p < .05$ . Largest differences are shaded).*

Scale	Scale Description	Females No Disabilities			Females With Disabilities			Statistics				
		N	Mean	SD	N	Mean	SD	Diff	df	F	Sig	
1	Student Centeredness	3479	5.18	1.03	220	5.05	1.14	-0.13	1, 3697	3.21	0.073	
2	Instructional Effectiveness	3479	5.19	0.95	220	5.05	1.03	-0.14	1, 3697	4.18	0.041	*
3	Responsiveness to Diverse Populations	3479	5.49	1.08	220	5.42	1.30	-0.06	1, 3697	0.71	0.400	
4	Campus Support Services	3479	5.02	1.15	220	4.78	1.31	-0.24	1, 3697	9.00	0.003	*
5	Safety and Security	3479	5.15	1.10	220	5.09	1.20	-0.06	1, 3697	0.71	0.401	
6	Academic Advising/Counseling	3479	5.03	1.18	220	4.96	1.28	-0.07	1, 3697	0.69	0.405	
7	Admissions and Financial Aid	3479	4.96	1.06	220	4.88	1.07	-0.09	1, 3697	1.36	0.244	
8	Academic Services	3479	5.46	0.91	220	5.22	1.03	-0.25	1, 3697	14.95	0.000	*
9	Registration Effectiveness	3479	5.20	0.95	220	5.13	0.99	-0.07	1, 3697	1.21	0.271	
10	Service Excellence	3479	5.14	0.93	220	4.99	1.01	-0.14	1, 3697	4.80	0.028	*
11	Concern for the Individual	3479	4.90	1.13	220	4.94	1.22	0.04	1, 3697	0.21	0.647	
12	Campus Climate	3479	5.15	0.92	220	5.02	1.00	-0.13	1, 3697	4.26	0.039	*
			<b>5.16</b>			<b>5.04</b>		<b>-0.11</b>				

**Appendix 9. Males With and Without Disabilities - Difference in Mean Satisfaction by SSI Scale. (Compared Using MANOVA.**

*\*Items showing statistical significance at  $p < .05$ . Largest differences are shaded).*

Scale	Scale Description	Males No Dis			Males With Dis			Statistics				
		N	Mean	SD	N	Mean	SD	Diff	df	F	Sig	
1	Student Centeredness	2192	5.04	1.08	174	4.84	1.24	-0.20	1, 2364	5.22	0.022	*
2	Instructional Effectiveness	2192	5.01	1.00	174	4.91	1.17	-0.11	1, 2364	1.78	0.182	
3	Responsiveness to Diverse Populations	2192	5.31	1.14	174	5.19	1.33	-0.11	1, 2364	1.54	0.215	
4	Campus Support Services	2192	4.86	1.18	174	4.59	1.41	-0.27	1, 2364	7.99	0.005	*
5	Safety and Security	2192	4.95	1.15	174	4.93	1.23	-0.03	1, 2364	0.09	0.770	
6	Academic Advising/Counseling	2192	4.94	1.18	174	4.86	1.32	-0.08	1, 2364	0.71	0.401	
7	Admissions and Financial Aid	2192	4.82	1.09	174	4.74	1.22	-0.08	1, 2364	0.86	0.354	
8	Academic Services	2192	5.29	0.98	174	5.10	1.19	-0.19	1, 2364	5.79	0.016	*
9	Registration Effectiveness	2192	5.01	1.01	174	4.93	1.17	-0.08	1, 2364	1.03	0.309	
10	Service Excellence	2192	5.04	0.96	174	4.88	1.10	-0.16	1, 2364	4.57	0.033	*
11	Concern for the Individual	2192	4.78	1.14	174	4.76	1.32	-0.02	1, 2364	0.03	0.869	
12	Campus Climate	2192	5.01	0.97	174	4.83	1.15	-0.18	1, 2364	5.60	0.018	*
			<b>5.01</b>			<b>4.88</b>		<b>-0.12</b>				

**Appendix 10. Correlation of Performance Gaps With Retention by Sex and Disability.**

Correlations		Scale	1	2	3	4	5	6	7	8	9	10	11	
			Retained 20093	StudCent Diff	IE Diff	CampusSS Diff	Safety Diff	AcAdvise Diff	AdFinAid Diff	AcadServ Diff	RegEff Diff	ServExcel Diff	ConcernInd Diff	CampClim Diff
All Pre-university	Retained 2009	Pearson Correlation	1	-.040	-.041	-.043	-.019	-.021	-.046	-.049	-.069	-.033	-.018	-.042
		Sig. (2-tailed)		<b>.022</b>	<b>.017</b>	<b>.015</b>	.274	.229	<b>.010</b>	<b>.005</b>	<b>.000</b>	.059	.312	.017
		N	3338	3319	3317	3232	3294	3297	3159	3284	3312	3309	3312	3320
			Retained 20093	StudCent Diff	IE Diff	CampusSS Diff	Safety Diff	AcAdvise Diff	AdFinAid Diff	AcadServ Diff	RegEff Diff	ServExcel Diff	ConcernInd Diff	CampClim Diff
<b>F No Disability</b>	Retained 2009	Pearson Correlation	1	-.057	-.061	-.021	.002	.008	-.014	-.038	-.052	-.016	-.008	-.037
		Sig. (2-tailed)		<b>.012</b>	<b>.007</b>	.357	.931	.729	.540	.092	<b>.022</b>	.474	.718	.107
		N	1960	1953	1951	1909	1941	1943	1856	1939	1949	1949	1949	1953
<b>M No Disability</b>	Retained 2009	Pearson Correlation	1	-.015	.004	-.065	-.026	-.074	-.083	-.051	-.079	-.052	-.028	-.036
		Sig. (2-tailed)		.602	.905	<b>.029</b>	.387	<b>.012</b>	<b>.006</b>	.083	<b>.007</b>	.076	.340	.215
		N	1164	1157	1157	1121	1146	1147	1103	1137	1156	1153	1154	1158
<b>F With Disability</b>	Retained 2009	Pearson Correlation	1	-.012	-.097	-.144	-.192	.008	-.178	.014	-.130	-.090	-.068	-.095
		Sig. (2-tailed)		.893	.292	.120	<b>.037</b>	.929	.057	.884	.158	.332	.461	.300
		N	123	120	120	117	119	119	115	119	119	119	120	120
<b>M With Disability</b>	Retained 2009	Pearson Correlation	1	-.094	-.154	-.005	-.157	-.068	-.053	-.186	-.173	-.053	-.085	-.119
		Sig. (2-tailed)		.383	.149	.967	.145	.531	.631	.082	.107	.625	.426	.267
		N	91	89	89	85	88	88	85	89	88	88	89	89

**Appendix 11. Outcomes of ANOVA for Instructional Effectiveness and Gap Size by Sex and Disability.**

	<b>N</b>	<b>Model</b>	<b>Variables</b>	<b>df</b>	<b>F</b>
<b>F No Disabilities</b>	1951	1	Instructional Effectiveness	1, 149	6.86
		2	CRCM (Covariate) Instructional Effectiveness	1, 148	455.24 1.93
<b>M No Disabilities</b>	1157	1	Instructional Effectiveness	1, 1155	.34
		2	CRCM (Covariate) Instructional Effectiveness	1, 1154	236.94 .188
<b>F With Disabilities</b>	120	1	Instructional Effectiveness	1, 118	1.05
		2	CRCM (Covariate) Instructional Effectiveness	1, 117	18.45 .594
<b>M With Disabilities</b>	89	1	Instructional Effectiveness	1, 87	2.35
		2	CRCM (Covariate) Instructional Effectiveness	1, 86	13.59 2.43